Teresa Maria Freitas Teixeira de Morais Garcia-Marques

THE MIND NEEDS THE HEART:

The Mood-As-Regulation-Mechanism Hypothesis As An Explanation For The Impact Of Mood On Processing.

Lisboa

1998

**Dissertação de Doutoramento em Psicologia ,
apresentada na
Faculdade de Psicologia e Ciências da Educação da
Universidade de Lisboa**

Adviser: Professor Diane Mackie,
Department of Psychology - University of California
Santa Barbara.

Co-Adviser: Professor António Branco Vasco,

This work has been financially supported by the Fundação para a Ciência e Tecnologia.

This work is dedicated to those who were in my mind all the time I was carrying it out: my husband Leonel and our two children, Inês and Pedro from whom I had to be apart for long periods of time. Each sentence of this theses was written having you in my mind

ACKNOWLEDGMENTS

I hereby acknowledge to whom it may concern that this dissertation does not stand here as a product of my work (only). This dissertation is the result of all the special attention, time, support and love that some very special people provide me with during these last years. Thus, I will try to re-write here what is already written for ever in my heart.

Professor Diane Mackie, my adviser. Since the beginning of this project she has been an inspiration, a professor, a mentor. Ever since the first versions of this dissertation, Dr. Mackie has been the shrewdest critic, the most systematic organizer, most attentive supervisor, and even the most careful proof corrector. With her I was given the opportunity to learn what is the real role of an adviser. Thank you! In additional, I want to thank you for being a friend who shared my anxieties and bear with me, my fears, my fatigue, and my need to be near my family.

To Professor Antonio Branco Vasco, the co-adviser of this dissertation, who kindly provided me with his support and who always believe in me, sometimes even despite myself. He was and is an inspiration and above all a real friend.

To my colleague, professor and friend Leonel Garcia-Marques, who was always there for me to open my eyes to the world of the cognitive and social cognition literature. Who was always there for a feedback on my thoughts. Through him I was given the opportunity to understand what it takes to do scientific work.

To my husband Leonel Garcia-Marques, who had to bear living with no wife during this last years. Without his comprehension, his patience, his love, this dissertation would never had been done. I thank him for being such a wonderful husband and such a wonderful and loving parent to my children.

To my children, who learned to accept this work as the reason why they did not had a full time mother....my thanks and the promise that mummy is going to try to do much of the things she promised to do after finishing this work.

To Alex Mackie, who had to share with me some of his mother time.

To D.Mecia de Sena, a wonderful friend. Without her I would never had the courage to be far away from my dear ones for such a long long. She was my social and emotional support for all that time. Thank you.

The present studies were partial carried out at the department of Psychology, University of California Santa Barbara. I am grateful to all in the department, for the good working atmosphere and the positive support to all my work. To all the students of the Social Psychology thank you for all the support and special for the patience they had to have whenever I used the laboratory to run the studies. Special thanks to Crystal Wright and Sara Queller for all the kind help they gave to me relative to my work and the social support they provided me with.

To Professor Dave Hamilton, a friend who always gave me support during my stay at the University of California, Santa Barbara

For all those undergraduate students who help me running the experiments Amber Sanders, Lisa Corsello, Ryan Williams, Reza Amadi and Kelly Shanahan, my thank you. In special, to Michael Selfreg without whom I would never had ran all the subjects for my last experience.

I would like also to thank to the Faculdade the Psicologia a Ciências da Educação da Univerisdade de Lisboa, where I was introduced to psychological science and where I gladly return as a doctoral student.

To the Instituto Superior de Psicologia Aplicada, I want to thank all the support that it provided me with before, and during the period I was developing this dissertation. Its efficiency and comprehension turned my work into pleasure. A special thanks for those who continuously help me.

To the Fundação para a Ciência e Tecnologia which financially support my doctoral studies and the conception of this dissertation, my thanks.

Last, but not least, I would like to express my gratitude to my family and friends, for having been able to encourage me and back me up.

ABSTRACT

As a rule, happy people do not engage in deep, systematic, and analytic processing of information. Converging evidence from different fields instead suggests that happy people process information in many different domains heuristically, paying less attention to particular details of the situation, and relying more on established knowledge. Social psychologists have offered several alternative explanations for this phenomenon. Unfortunately empirical evidence has been mixed and inconclusive with regard to which model best accounts for the effect.

This dissertation offered a new explanation for the mood information processing effect, the **mood-as-regulation-mechanism hypothesis**, which states that: *positive affect (e.g., positive mood). is an integral aspect of the implicit feeling of familiarity, which triggers non-analytic processing because it signals the appropriateness of using previously stored information to deal with the current situation.*

Evidence for assuming not only that such a feeling is the mechanism that regulates processing but also that mood effects are grounded in it, is provided from both the cognitive and social cognition literature. Those approaches in the literature that view information processing as dualistic suggest the need for a processing regulation mechanism. Some models suggest that this mechanism is a feeling (a feeling of familiarity). The idea that this feeling of familiarity has a positive tone, also grounded in the literature, suggests that the experience of positive affect is an integral part of familiarity.

Results of four studies corroborated the mood-as-regulation-mechanism hypothesis. Manipulations of the implicit feeling of familiarity induced positive mood (Experiment 1) and manipulations of positive affect had an effect typically associated with familiarity (Experiment 2). In addition, two independent studies suggested that familiarity impacts processing in a way that fully parallels the impact of mood on processing (Experiments 3 and 4). Together, the results of the four studies offered consistent support for the mood-as-regulation-mechanism hypothesis.

RESUMO

Regra geral, as pessoas quando bem-humoradas, não processam a informação de uma forma profunda, sistemática e analítica. Dados convergentes de diversos campos da Psicologia, sugerem que as pessoas quando bem-humoradas processam a informação de forma heurística, prestando menos atenção a detalhes particulares da situação e baseando-se mais em conhecimento previamente adquirido. Os psicólogos sociais têm vindo a desenvolver diversas explicações alternativas para este fenómeno. A evidência empírica tem, porém, sido contraditória e inconclusiva na identificação do modelo explicativo mais adequado.

Nesta dissertação é apresentada uma nova explicação para o efeito do humor (estado de espírito) no processamento da informação: a hipótese do **humor-como-mecanismo-regulador**. Esta hipótese parte da ideia de que um sentimento positivo (por ex., o bom humor) faz parte integrante do sentimento implícito de familiaridade. Ora, é este último sentimento que faz desencadear um modo não-analítico de processamento, ao indicar que a informação previamente adquirida é suficiente para lidar com a situação.

Evidência, para a noção de que um tal sentimento é o mecanismo que regula o processamento e para a hipótese de que os efeitos do humor lhe estão associados, pode ser encontrada na literatura quer da Psicologia Cognitiva, quer da Cognição Social. Tais abordagens, ao conceberem o processamento de informação como dualista sugerem a necessidade de um mecanismo de regulação do processamento. Alguns modelos sugerem que este mecanismo é um sentimento (um sentimento de familiaridade). A ideia de que o sentimento de familiaridade tem uma tonalidade positiva, igualmente referida na literatura, sugere que um sentimento positivo é parte integrante do sentimento de familiaridade.

Os resultados de quatro estudos corroboram a hipótese do humor-como-mecanismo-regulador-do-processamento de informação. Manipulações do sentimento implícito de familiaridade induziram bom humor (Experimento I) e manipulações de bom humor tiveram efeitos tipicamente associados com familiaridade (Experimento II). Dois outros estudos sugerem que os efeitos da familiaridade no processamento são idênticos aos efeitos do humor no processamento (Experimentos III e IV). No seu conjunto, os resultados destes quatro estudos corroboram a hipótese do humor-como-regulador-do-processamento-de-informação.

TABLE OF CONTENTS

APPENDIX

List of Figures

List of Tables

CHAPTER I :

Is the Heart related to the Mind?

The impact of affect on thinking. The Mood Information Processing Effect (MIPE)

Most people would agree that feelings can interfere with a person's cognitive functions. A person in love is thought of as seeing the world through rose-colored glasses, as a rather distracted and dreamy person. It is also common knowledge that it is better not to speak with someone in a position of authority (boss, parent, or professor) when he or she is in a bad mood. People expect others in a bad mood to give undesirable answers or to make harsh judgments.

This common-sense knowledge is supported by psychological research. Directly or indirectly, mood seems to affect both how information is processed and the output of processing. Mood influences the types of processes subjects engage in by influencing the extent to which they extensively elaborate presented information. It affects output when feelings are incorporated into the process as relevant information or when they influence the contents of the thoughts that dominate the process.

Converging evidence from different research domains such as, for example, persuasion (see Mackie, Asuncion, & Rosselli, 1992; Schwarz, Bless, & Bohner, 1991, for reviews), decision making (Isen, 1987), helping behavior (Schaller & Cialdini, 1990), creativity (Isen, 1987), problem solving (Kaufman & Vosburg, 1997), reasoning (Melton, 1995), categorization (Isen & Daubman, 1984), and attribution (Sullivan & Conway, 1989), suggests that individuals in positive, neutral, or negative moods engage in different modes of information processing. Individuals in positive moods process information heuristically, paying less attention to particular details of the situation, relying more on established knowledge structures such as impressions, stereotypes, and prior opinions, developing and using broader, more inclusive categories, and making simpler, inferential, or cue based judgments. We will term this mode of thinking non-analytic processing. In contrast, individuals who are not happy engage in more careful, analytic processing, rely less on categorical information, and commit themselves more often to attributional processing rather than merely drawing inferences. This mode of processing will be referred to as analytic processing. This association between mood and particular ways of processing information will be termed the "*mood information processing effect*" (MIPE).

What is the MIPE?

Even a cursory consideration of the implications of the MIPE reveal it to be an important phenomenon. The MIPE informs us that the impact of affect on cognition goes beyond coloring the output of processing and actually influences how information is processed. Such influence is not to be thought of as disturbing processing. The MIPE does not define affect as making processing easy or difficult or making the result of processing better or worse. Instead the role of affect is to make processing different -- to change the way information is processed. This association corroborates the idea that affect and cognition, heart and mind, are interrelated. It tells us that not only is affect dependent upon cognitive factors (see, for example, Abelson, 1983; Lazarus, 1984; Ortony, Clore, & Collins, 1988) but that cognitive processing is also dependent upon affective factors (see Carver & Scheier, 1990; Oatley & Johnson-Laird, 1987; Simon, 1967). The MIPE, is, thus, an empirical finding that clearly supports the idea that cognitive events and affective states are interdependent, and that a complete understanding of one is not possible without consideration of the other.

This dissertation attempts to contribute to this further understanding by more closely analyzing the MIPE, describing and critiquing current explanations for it, and offering and empirically testing a new explanation for it. In the rest of this first introductory chapter, I examine the basic assumptions of each of the major current explanations for the MIPE, discussing their commonalties and their differences. I then point out some of the theoretical ambiguities, empirical inconsistencies, and a more recently offered account, that challenge current understanding of the MIPE. To meet that challenge, I then describe the major premises of a proposed new explanation of the MIPE. The viability of this new proposal depends on its feasibility as regards what is currently known about mind and about affect, as well its fit with empirical data. The rest of the dissertation deals with these issues. This chapter closes with a preview of the content of Chapter II through VI.

Current explanations of the MIPE

Understanding the impact of mood on processing has become quite important. Since its initial identification by Worth and Mackie in 1987, the MIPE has been the target of multiple explanatory attempts. In general, these approaches have focused on the impact of affect either on motivational variables or on the resources available to process incoming information. Thus, the explanations that have been offered for the MIPE tend to conceptualize this effect as indirect. They do not see affect in and of itself influencing information processing. Instead its influence is seen as deriving from its impact on other factors that can do so. The MIPE is thus understood to be moderated by other variable(s) that are relevant to processing. Two different kinds of factors have been posited as having such a role: capacity and motivational factors.

Capacity and motivation: Definitions

Information processing is understood to vary as a function of the amount of resources available to it. The total amount of these resources defines the current capacity[1] to process information (which is limited, Simon, 1969). The information

---

[1] Capacity is difficult to define because it has been used to refer to a variety of variables such as free working memory space, presence of knowledge necessary to compute a response, time necessary to allow a process to be developed and number of items necessary to be integrated into the process. Moreover, the term capacity has often been confounded with the term attention (such that cognitive resources are referred to as attentional resources), itself a vague concept (see, for example, Pasher & Carrier, 1996).

processing system is a kind of capacity manager, with some control over how its limited capacity can be distributed across different tasks or different task components (Kahneman, 1973). These tasks, or task components, themselves vary in their demands for capacity. Simple or well learned tasks are less demanding than complex and new tasks. Personal factors, such as affect, arousal, and preoccupation have been claimed to influence the degree of capacity individuals can invest in specific tasks (e.g. Gilbert, Pelham, & Krull, 1988; Higgins & King, 1981; Isen, 1984). Also, various situational factors, such as time pressure, noise, and complexity of the situation, have all been shown to influence capacity to process information (e.g. Bodenhausen & Lichenstein, 1987; Gilbert, et al., 1988; Jacoby, Toth, & Yonelinas, 1993; Kruglanski & Freund, 1983; Petty, Wells & Brooks, 1976; Ratneshwar & Chaiken, 1991; W. Wood, 1982). Thus, people are able to perform a task or even several tasks simultaneously, in so far as the task's or tasks' demands do not exceed current "available capacity." The impact of factors that "reduce" available capacity must thus be considered in relation to the capacity that tasks demand.

It is important to note that reduced capacity is not necessarily related to poorer performance in terms of behavior accuracy and quality (see Payne, Bettman, & Johnson, 1993, for a review). First, even when there are no constraints on capacity, individuals sometimes engage in less demanding processing of information. Rather than expending effort to produce the most accurate judgment, people instead seek a "satisfactory level" (Simon, 1957), a "reasonable enough" or "sufficient reason" (E. E. Jones & Davis, 1965) for their actions and decisions. Second, these "shortcuts" in processing are able, at least in some cases, to produce accurate responses (for example, when a well learned response become automatic). However, whenever different modes of processing furnish different (not necessarily more or less accurate) responses, lack of resources is associated with domination of the output by the responses furnished by the less demanding processing mode. Capacity explanations of the MIPE are thus based on the assumption that mood states differentially "consume" capacity.

Even without capacity constraints, people vary in the amount of resources they are willing to allocate to each task[2]. Willingness is a concept related to individuals' degree of motivation to engage in a specific process. In fact, the concept of motivation has been associated with both what process is activated and the level of individuals' engagement in that process. In the first case, motivation has a directive meaning and in the second case, it has an energetic meaning.

Current processing goals (directional needs, or needs for specific closure, Kruglanski, 1989, 1990, 1996; proximal goals, Pittman, 1998), defining the objective with which an action is initiated, influence individuals' engagement in qualitatively different processes (Chaiken, Giner-Sorolla, & Chen, 1996; Hamilton, 1981). Some

---

[2] Although capacity and motivation have been distinguished as two independent factors, they seem to be highly related. Motivation determines the current direction and intensity of *attention* (Simon, 1967). The information processing system distributes the available resources among different tasks or goals (Kahneman, 1973). In conditions of high motivation effort will be concentrated on executing the system's current goal. Other cognitive activities will be interrupted or minimized to an extent that reflects the difference in motivation associated with those activities and the target task. This framing of motivation in terms of capacity management views individuals who do not "process information fully" because "they do not have capacity to do so," as individuals who are equally or more motivated to do other tasks. Individuals who "lack motivation for a task", are individuals who are not directing their capacity to that particular task. This point of view is not only more parsimonious but also able to explain the difficulty of manipulating capacity and motivation alone (see, for example, Mackie & Worth, 1990 and Schwarz, Bless, & Bohner, 1991). From this perspective we can understand why time constraints can be thought of as a capacity manipulation (e.g. Mackie & Worth, 1989) or as a processing goal manipulation (the goal of making a fast judgment because of a deadline, or a general need for structure, Kruglanski, Freund, & Bar-Tal , 1996).

goals (e.g. accuracy) make individuals prone to a careful processing of information. Other goals (e.g. speed) make them prone to non-analytic processing. Goals direct behavior toward a specific end and so toward different routes of action.

However, more general non-directional motives (needs for non-specific closure, Kruglanski, 1989, 1990, 1996; distal goals, Pittman, 1998) may be superimposed on processing goals. Examples of such motives are: least effort (a general propensity to spend minimum effort in processing), the general desire for accuracy, response confidence, belief perseverance, and need for cognition (an individual variable which reflects the propensity to engage in complex thinking, see Cacioppo & Petty, 1982). Such goals may raise the individual's threshold for deciding they have what Allport (1954) called sufficient warrant" to process (Pittman, 1998, p. 380, see also Chaiken, 1980) or may relax this perceived need, engaging individuals in different modes of processing.

Thus, individuals' current goals determine the characteristics of their specific actions. However, the "potential for that current action" (Brehm & Self, 1989; Wright & Brehm, 1989) is expected to vary in intensity. A low level of motivation is associated with low potential for action. Thus, an individual who sees no worth in extending "more" effort in pursuing a specific goal is unmotivated. High potential on motivation is accompanied by an increased effort in pursuit of that goal. These different degrees of motivation are related to differences in how information is processed (e.g. Petty & Cacioppo, 1979, 1986). Whereas high levels of motivation raise the likelihood that individuals will process information deeply, low levels of motivation decrease the likelihood of such processing. Motivational explanations of the MIPE assume that individuals in different mood states have different processing goals that in turn engage them in different processing modes.

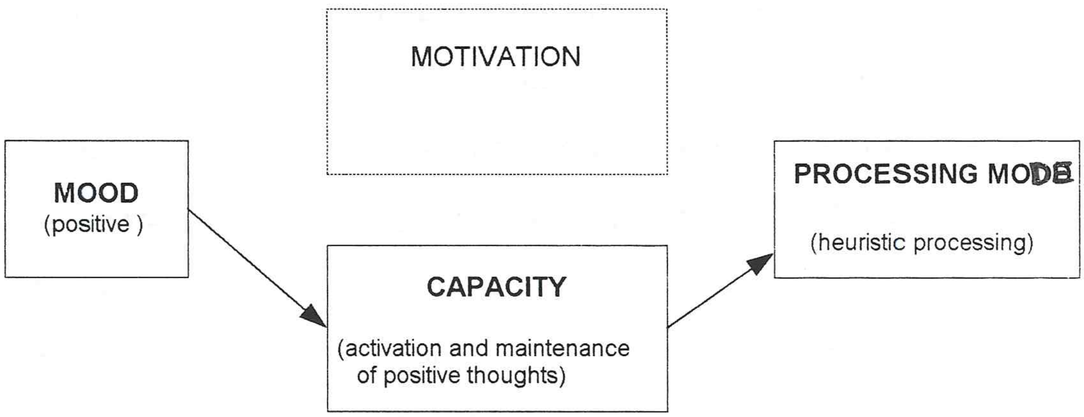
Capacity explanations of the MIPE

Capacity explanations of the MIPE are based on the assumption that mood states differentially "consume" capacity. There are essentially two explanations of the MIPE that can be labeled capacity explanations. Both stress the direct impact affective states have on the availability of processing resources as the only mediator of mood's impact on how information is processed. Thus the cognitive capacity view of the MIPE contends that different affective states render people differently capable of processing incoming information. This view is built on the assumption that reduction in capacity resources affects how information is processed. A role in limiting capacity resources has been attributed to both positive and negative mood. If both positive and negative mood states induce a reduction in processing capacity, individuals in these mood states should engage in less effortful processing compared to those in neutral mood states.

Resource allocation hypothesis of positive mood.

As the mood-congruent retrieval view suggests (Bower, 1981, 1991), there seems to be greater accessibility of and a greater amount of diverse congruent material in memory under conditions of positive affect than under other mood states (Isen, 1984, 1987; Isen, Shalker, M. S. Clark, & Karp, 1978). The resource allocation model of positive mood (Mackie & Worth, 1989; Worth & Mackie, 1987) explicitly refers to this high accessibility of congruent material in memory as a possible reason why positive mood may lead to less extensive and less elaborated processing. The diversity and amount of information activated in memory provides a "distracting cognitive context" (Mackie & Worth, 1989, p.28), a condition of overload, that may prevent individuals from focusing their attention on tasks that require more analytic processing. People in a positive mood may wish to attend incoming information more carefully, but capacity deficits do not allow them to.

Figure 1.1: Resource allocation hypothesis: positive mood as a distraction cue (Mackie & Worth, 1989; Worth & Mackie, 1987)



The resource allocation explanation of positive mood effects offered by Mackie and her collaborators (Mackie & Worth, 1989; Mackie, et al., 1992; Worth & Mackie, 1987) has several theoretical implications. It was developed within a memory network framework where memory activation is ruled by a spreading activation principle. Mackie and her collaborators were concerned only with the implications of the accessibility of positive thoughts in positive mood states. The impact on processing of positive affective states is contrasted with that of neutral affective states[3]. Positive affect engages individuals in more superficial processing whereas in neutral affective state individuals engage in deeper and more elaborated processing. As the model was developed within the persuasion domain, these different processing modes tend to map onto the differences between systematic and heuristic processing (Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1981, 1986). Systematic processing is defined as "an analytic orientation to information in which perceivers access and scrutinize a great deal of information for its relevance to their judgmental task" (Eagly & Chaiken, 1994, p.326). Heuristic processing can be defined as *a* "non-analytic and less effortful processing which involves the activation of well learned and frequently activated inferential rules" (Eagly & Chaiken, 1994, p.326; these two processing modes are compared in more detail in the next chapter). The model is thus rooted in a dualistic informational processing view, and has been extended to other fields of social cognition where dual processing modes have been proposed, such as person perception and stereotyping (e.g. Bodenhausen, 1988; 1993; Hamilton, Stroessner, & Mackie, 1993; Stroessner & Mackie, 1993). A mood state is expected to be related to one of two processing modes depending on a single critical criterion – the mood state's impact on an individual's cognitive capacity. That is, since one mode of processing places heavy demands on the availability of cognitive resources, and the other does not, mood effects on available cognitive capacity are thought to mediate that relationship. The model does not assume any direct impact of mood on the extent to which the information is elaborated. Mood effects are

---

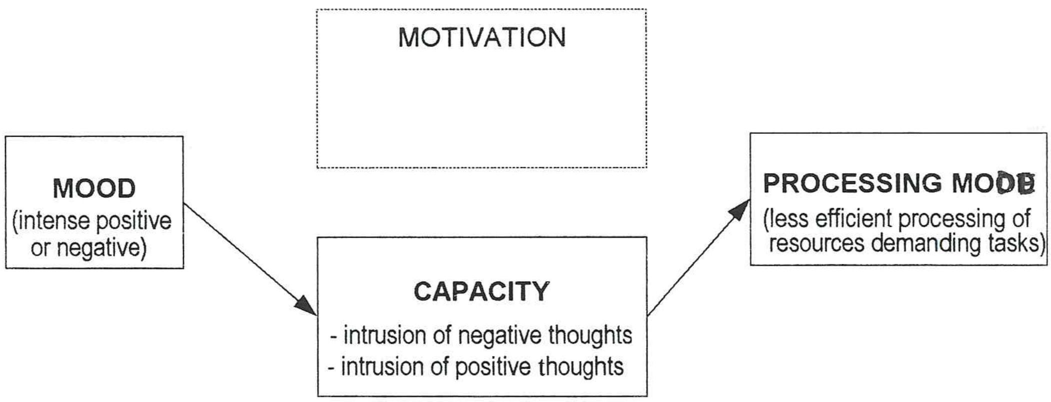
[3] Mackie's model does not necessarily predict symmetrical effects of negative and positive mood. "Cognitive models need not predict such symmetrical effects. Because we try to distract ourselves from negative, but not from positive mood, we may weaken the associative links between negative items much more than we do those between positive elements. This activation of positive material may have much more powerful effects on attentional allocation than activation of negative information" (Mackie & Worth, 1990, p. 216).

mediated by the amount of information activated in memory. The activation of extensive positive mood related material influences ongoing processes by interfering with attentional allocation to other tasks. Positive mood acts as a distraction cue. The decrement of attention directed to a particular task makes systematic processing more difficult and less likely. Corroborating this hypothesis, Mackie and Worth (1989) showed not only that happy individuals took more time to process message content than did neutral individuals, but also that when happy individuals were given the opportunity to take more time, they did engage in deeper processing. As the model does not attribute any particular informational role to mood, the perceived origin of mood is not expected to alter the probability of an individual engaging in a particular information processing mode.

Resource allocation hypothesis of negative mood.

The hypothesis that negative mood can have similar capacity limiting effects has also been suggested (Ellis & Ashbrook, 1988; Ellis, Thomas, & Rodriguez, 1984; Hasher & Zacks, 1979; Schwarz et al., 1991; Sullivan & Conway, 1989). Both the intrusion of negative thoughts stimulated by a negative mood, and the fact that those negative thoughts stimulate a search for explanations, are seen as limiting an individual's attentional resources. Ellis and Ashbrook (1988) suggest that emotional states regulate the amount of capacity that is able to be allocated to a particular task. Their resource allocation model considers extremely intense mood states to be disruptive. Disruptive mood states, either positive or negative, reduce capacity, and thus have a negative effect on performance on memory, judgment, and other tasks. In contrast, mild moods are unlikely to have too much impact on performance (Ellis, 1985; Ellis & Ashbrook, 1988). This is, in fact, an important aspect of this model. By distinguishing between the effects of severe and mild affective states, the model raises the possibility that mood states with the same valence (negative or positive) but different intensity (mild versus severe) have a different impact on the way individuals process information. Although this hypothesis has been proposed by other authors (e.g. Schwarz, 1990), it has not been considered by any of the other models, and there is no definitive empirical evidence for it.

Figure 1.2: Resource allocation hypothesis: intense mood states as (Ellis & Ashbrook, 1988; Ellis, Thomas, & Rodrigues



Unlike Mackie and her collaborator's model, the hypothesis regarding negative mood state is not grounded in a dual process framework. Depressed subjects are not taken to be particularly prone to superficial information processing, but are expected to exhibit growing performance deficits as tasks demand more and more capacity (see Hartlage, Alloy, Vasquez, & Dykman, 1993, for a review). There is, however, some evidence suggesting that depressed mood leads to deficits only in initiative, and not in quality, of performance (e.g. Hertel & Hardin, 1990).

Motivational explanations

Motivational explanations of the MIPE assume that individuals in different mood states have different processing goals that in turn engage them in different processing modes. The motivational explanations of MIPE stress that an individual's goals are the main determinants of performance. There are things "we want" and there are things "we do not want" and "we act in conformity to our desires". Although the different motivational explanations of the MIPE attribute different mediational roles to a person's desires, all these explanations assume that mood does not prevent deeper information processing. It simply reduces the desire for deeper processing. The critical feature is not that individuals *cannot process deeply* but that individuals do *not want to do so.*

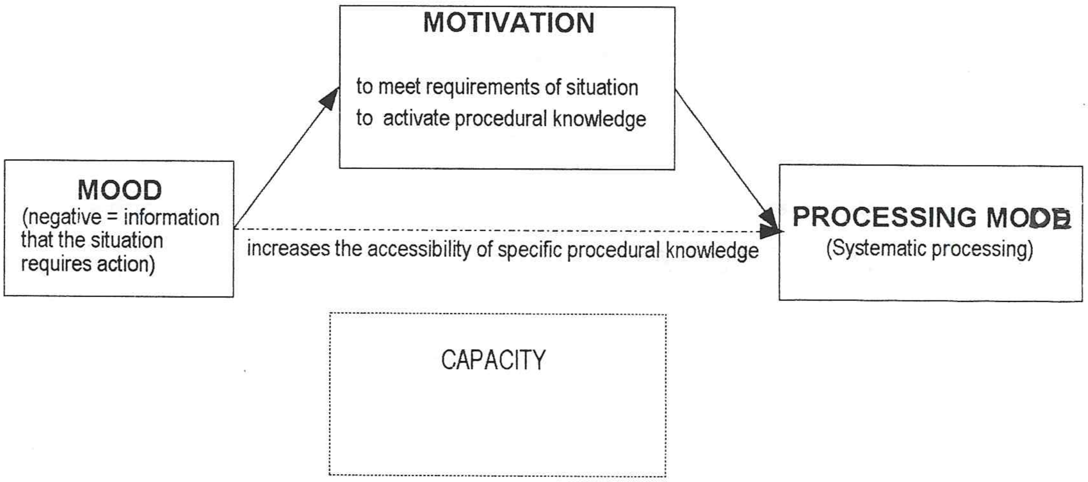
Cognitive tuning hypothesis

The cognitive tuning hypothesis (Clore, Schwarz, & Conway, 1994; Schwarz, 1990; Schwarz & Bless, 1991) is based on several assumptions. First, in accordance with an hedonic perspective (e.g. Allport, 1954), it assumes that people are motivated to obtain positive and to avoid negative outcomes. Second, consistent with

Schwarz and Clore's (1988) hypothesis, it assumes that feelings have essentially an informative role, and so current feelings inform individuals about the nature of their current psychological situation. A positive affective state informs individuals that their situation is benign and a negative affective state informs them that their environment is unfavorable. Putting these two ideas together, the model assumes that "the individual's thought processes are tuned to meet the requirements of the psychological situation that is reflected in their feelings" (Schwarz & Bless, 1991, p.60). Another important assumption of this model is that affect can prime or activate not only substantive but also procedural information. Affect is, thus, information not only *about how to understand a particular situation* but also *how to deal with it*. A negative affective state informs a person that action needs to be taken and at the same time increases the accessibility of procedural knowledge that has been shown to be effective in dealing with similar situations in the past (that is, a detail-oriented resource-dependent processing style). Positive feelings, typically elicited by previous situations that did not call for any particular action, usually do not elicit the activation of available attentional resources nor do they prime any specific procedure. Such situations, although favoring the use of simplifying heuristic strategies, provide the individual with greater cognitive flexibility. This flexibility allows them to: a) manage their attentional resources as they like in order to pursue their goals; b) explore novel procedures and new, more creative, associations, and c) make more risky decisions since the situation is considered safe.

The model stresses a preferential association of certain affective states with the activation of procedural knowledge that is more or less analytic. Negative affect primes more analytic procedural knowledge and positive affect primes non-analytic procedural knowledge. However, at the same time, the model also provides for a number of factors (conditionals, Clore et al., 1994) that can short-circuit that association. The most important of these factors is the attribution of mood source. That is, when the cause of the current affective state is perceived as uninformative regarding how problematic the situation is, or how adequate current processing efforts and strategies are, mood ceases to be associated with differential processing modes. Nor can negative mood states be associated with a more extensive processing if individuals "focus on dealing with the source of their unpleasant affect rather than engaging in systematic processing on an unrelated task" (Clore et al., 1994, p.401). The cognitive flexibility attributed to positive affective states enables individuals in positive moods to activate procedural knowledge related to systematic, analytic processing if need be. Thus as regards how information is to be processed, a basic assumption of this model is that there are different procedural knowledge structures. These procedures are more or less analytic. "Negative affective states increase the cognitive accessibility of analytical reasoning procedures" (Schwarz, 1990, p.550). In order to carry out those analytic, detail-oriented procedures, individuals need capacity resources. Positive mood states are more likely associated with the operation of simplified, non-analytic strategies (less capacity demanding procedures). In fact, a set of different strategies are always simultaneously activated and happy individuals have greater flexibility to manage basic resources. They can select either a more analytic or a less analytic strategy. However, since positive affect informs the processor that the situation is non-problematic and since non-analytic strategies are more available, a less demanding strategy will tend to be selected most of the time.

Figure 1.3: The cognitive tuning hypothesis (Schwarz, 1990; Schwarz & Bless, 1991)



The procedural characteristics of the model make the process by which mood influences processing independent of any claim about capacity. In negative situations, the procedural knowledge structure that is activated tends to be more analytic. Regardless of whether it demands resources or not, such analytic processing allows negative situations to be dealt with more adequately. In the author's own words, "this should increase the speed with which adequate procedures can be applied to the negative situation. Moreover, it should decrease response competition between various applicable procedures, thus reducing the likelihood that other potentially applicable but less effective procedures will be selected" (Schwarz, 1990, p. 547). In contrast, a benign situation is not associated with the accessibility of more or less demanding procedures and does not constrain individuals' behavioral decisions to less demanding ones (Schwarz, 1990). It favors non-analytic processing only because it fails to focus attention on a need for more careful processing.

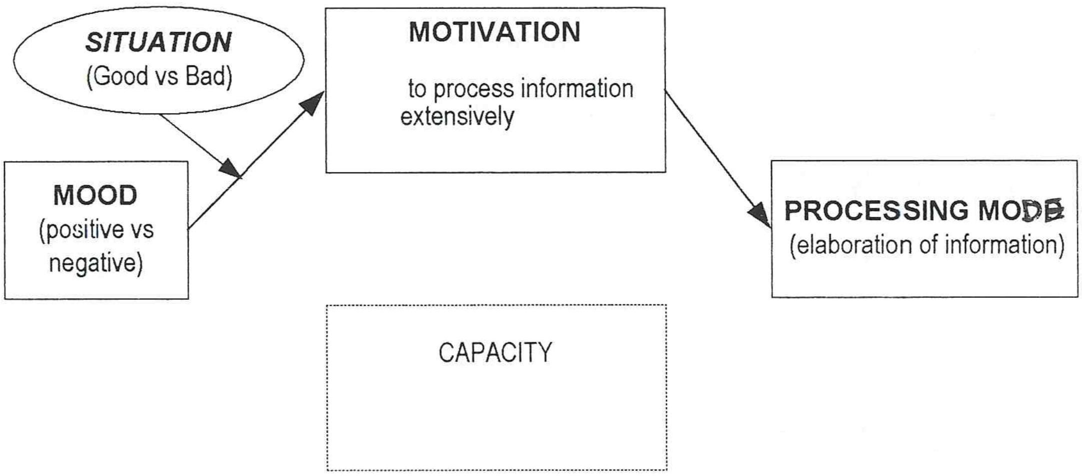
Hedonic contingency hypothesis

Wegener and Petty's (1994, 1996) hedonic contingency view is based on the assumption that different affective states produce different mood management propensities. Either superficial or extensive processing of information might occur in the service of maintaining a happy mood or in the service of escaping a sad one. Scrutiny of the possible hedonic consequences of actions is, however, assumed to be more likely in positive than in negative moods. This because the hedonic contingencies of most situations are relatively good for individuals in negative moods. Most behaviors will produce a better, more positive, state. In contrast, most of the hedonic contingencies for individuals in positive moods are negative. A positive mood will dissipate if individuals attend carefully to most situations. It is, therefore, very important for happy individuals to attend carefully to the possible hedonic impact of a situation before becoming deeply involved in it (i.e., processing it extensively). As the hedonic contingencies for individuals in positive moods are mostly bad, the mood-management hypothesis suggests that positive mood states are more frequently associated with less extensive processing. More elaborate processing will be perceived as mood-threatening in most cases. Nevertheless, if elaboration is perceived as promoting a positive mood state, even individuals in positive moods will choose to do it.

In this view a person's mood can act as a discriminative stimulus, a stimulus that signals what kind of hedonic reinforcement contingencies are at stake (Wegener & Petty, 1996). On the one hand, negative feelings signal that either paying attention to or ignoring the hedonic contingencies of behavior will be equally rewarded. On the other hand, positive feelings signal the need to pay careful attention to those contingencies in order to be rewarded. Note, however, that this role of mood does not give it any informational status regarding the actual valence of the individual's environment, as postulated by an informational approach. Attribution of the current mood state to a specific stimulus is not expected to affect the relation of mood to a particular processing mode.

This approach was developed in the framework of the Elaboration Likelihood Model (Petty & Cacioppo, 1986, see next chapter) which assumes a dual process perspective: information is processed either in a more detailed, analytic, and effortful processing mode or a less elaborated processing mode that relies on simpler strategies. Both motivational and cognitive factors are expected to influence how information is processed. Mood is thought to influence the likelihood of elaboration by influencing individuals' motivation to elaborate in any specific circumstance. As noted earlier, although a positive mood state is more likely to be associated with less effortful processing, such an association is simply probabilistic. This view, in contrast to others, does not limit positive mood to a single kind of processing. Positive mood triggers simplified processing modes only when avoiding elaboration allows one to feel better. Positive mood leads to greater elaboration if such processing is expected to induce further positive feelings.

Figure 1.4: Mood management: The hedonic contingency hypothesis (Wegener & Petty,1994; 1996)



In sum, this model encompasses a hedonic perspective by assuming that individuals are motivated to feel good. Individuals are assumed to exert cognitive effort on tasks they *think of* as pleasant but not on tasks they *think of* as unpleasant. The explanation of mood and processing effects offered by this view is only motivational. The likelihood of elaboration is greatly reduced by a positive mood state as there is a greater chance that engagement in any given task will eliminate positive feelings. In contrast, there is a high likelihood of elaboration by unhappy individuals. The level of mood management engaged in by those in neutral moods is not expected to differ much compared to that of those in negative moods (Wegener & Petty, 1996) – both groups are expected to process task-relevant information to a greater extent.

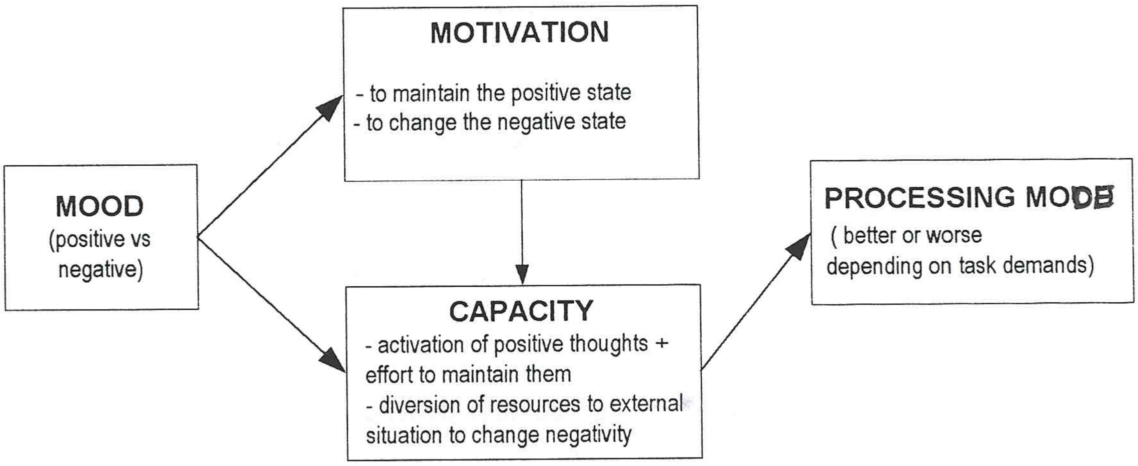
Explanations that invoke capacity plus motivation

Some explanations of the MIPE stress both capacity and motivation as mediating mood effect on how information is processed. In those approaches, both factors are understood to impact information processing either independently (but possibly conjointly) or dependently.

Positive priming hypothesis

Isen and her collaborators' (Isen, 1984, 1987, 1993; Isen & Levin, 1972; Isen & Simmonds, 1978) positive priming model stresses both motivational and capacity factors as explanation for the MIPE. One of its basic assumptions is an hedonic principle: *individuals are motivated to feel good.* If already in a good mood, they will be motivated to maintain their positive state, avoiding extensive processing in order to do so. Thus, happy individuals are expected to concentrate all their resources on mood preservation, avoiding any effort that could interfere with this activity. A second basic assumption of this model is that positive feelings prime the activation of positive memories (Bower, 1981, 1991). So individuals in positive moods are expected to bring to mind, and keep in mind, a large amount of positive information, and perhaps to perform extensive elaboration of this material. In contrast, individuals in bad moods will avoid their negative thoughts by focusing their attentional resources on available tasks. Deeper processing of information (particularly information of a pleasant nature) seems to function as a *strategy for mood repair*. Thus the model stresses that: 1) mood has an impact both on an individual's degree of motivation to attend to the environment and on capacity because of the amount of information activated in memory; 2) motivation also has implications for the amount of cognitive resources directed towards the current task. Although conceived within a memory framework, this view stems essentially from the tradition of conceptualizing human motivation in terms of seeking pleasure and avoiding pain (Allport, 1954).

Figure 1.5: The positive priming hypothesis (Isen, 1993)



Isen's model assumes that positive mood has a beneficial impact on some tasks and a detrimental effect on other tasks. Research has shown that individuals in positive mood perform better on tasks that benefit from greater accessibility of a large amount of interrelated information (e.g. tasks that require creativity: Isen, Daubman, & Nowicki, 1987; Isen, Johnson, Hertz, & Robinson, 1985; tasks that focus upon similarities and differences: Murray, Sujan, Hirt, & Sujan, 1990[4]). In contrast, positive mood lowers performance on tasks perceived as threatening mood and on

[4] There is some controversy regarding whether these two studies reflect real differences in flexibility of thought or if they reflect only differences in processing mode. That is, those in positive mood avoid effortful processing (see Sinclair & Mark, 1992).

tasks that demand deep processing of information (examples of such demanding tasks are physics problems and frequency judgments[5]: Isen, Means, Patrick, & Nowicki, 1982; or resolution of syllogisms: Melton, 1995).

There are some aspects of this model that should be underlined. The first concerns its representational assumptions and the second its procedural assumptions. The model is based on a general model of memory organization (a network model), with specific encoding and retrieval principles (spreading activation), to which some motivational hedonic principles have been added. With regard to procedural characteristics, the model does not assume a dualistic point of view and so does not posit an association between a mood state of a specific valence and a specific mode of processing information. That is, the model does not predict a consistent pattern of MIPE. Mood specific effects are evaluated in terms of an individual's level of performance, and understood to be "context dependent". The effects of positive mood on performance are mediated by positive mood's association with greater flexibility of thinking and its influence on how the task is perceived. As long as the task appears not to endanger positive feelings, even individuals in positive moods will operate in a more efficient and complex way. The model's assumptions also imply that mood effects are independent of the source of the mood. Regardless of whether the assumed source of the feeling is internal or external, positive mood effects are expected. Mood effects should therefore not be sensitive to external attributions of mood sources. The positive priming model does not give mood any informational role. Any mood effect on evaluative tasks is expected to be mediated by the valence

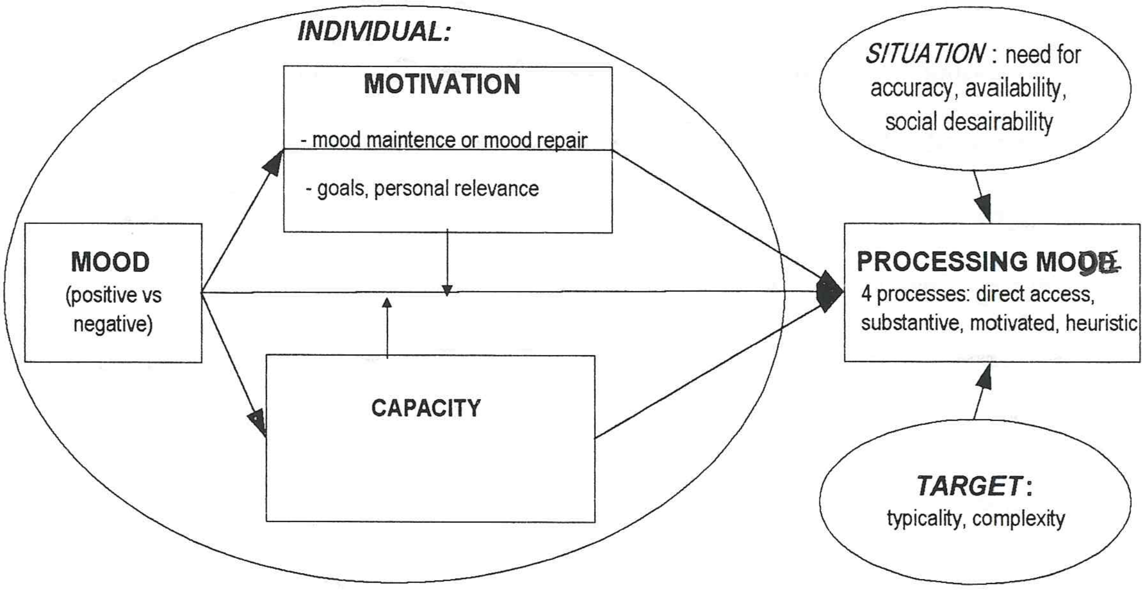
[5] Although the positive priming model refers to these tasks as demanding, there is some reason to doubt that this classification is accurate in the case of frequency estimations (Garcia-Marques & Hamilton, 1996).

of information accessible in memory rather than being a direct effect of mood's valence.

Affect infusion hypothesis

The affect infusion hypothesis (Forgas, 1991, 1994, 1995) conceptualizes the MIPE as a specific effect integrated into the general framework of the processing of social judgments. In this framework, mood is understood as one affective state that together with other affective states and other variables (such as motivational goals and cognitive capacity) can influence how information is processed. The model predicts that affect can play a role in determining both which strategy is going to be used in processing information and what information is dealt with in that strategy. Specifically the model predicts when and with what degree affect is "infused" into judgments. In addition to individual factors (affective states, personal relevance, motivational goals, cognitive capacity), the model suggests that features of the target (familiarity, typicality, complexity) and features of the situation (need for accuracy, availability of criteria, social desirability) can make individuals prone to engage in different processing strategies. Mood is one of a set of contextual influences which, in conjunction, regulate processing choices. The model identifies four independent processing strategies by which a judgment can be achieved: direct access, substantive processing, motivated processing, and heuristic processing. The direct access strategy is likely to be activated if the target is familiar or closely related to targets associated with already-established judgments. This strategy encompasses only a memory activation process. A substantive processing strategy is more likely if there is no pre-existing judgment and if the information is selectively processed. Most of the cognitive processes involved in this strategy are, however, associative, automatic, and uncontrolled. The motivated processing strategy involves a selective but more controlled processing of information. Processing serves a pre-existing goal and so requires little generative or constructive processing. A heuristic processing strategy, like direct access, does not involve substantive consideration of relevant information. It assumes that people short-circuit detailed processing to arrive at a new judgment by the simplest and least effortful means.

Figure 1.6: Affect infusion hypothesis (Forgas, 1991; 1994; 1995)



Temporary mood states directly or indirectly influence which processing alternative is adopted in a given situation. Individuals in positive moods are expected to process information heuristically. However, if these happy individuals are given an accuracy processing goal it is highly likely that they will engage in a substantive processing strategy. By default, negative mood is expected to induce substantive processing. Nevertheless, a lack of capacity will induce more heuristic processing and the existence of specific motivations will engage more motivated processing.

The affect infusion model postulates mood to effect processing by mediation of capacity and/or motivational (mood-maintenance or mood-repair) factors. However, it also assumes that mood can have a direct impact on how information is processed[6]. These direct effects are based on two set of explanations: a) a functionalist theory of emotion that assumes that affect exists for the sake of signaling states of the world to which the organism must respond and b) a general view of individuals as primarily motivated to control aversive events. Moreover, mood is also assumed to influence the quality of a judgment depending upon which of the various strategies is adopted. Heuristic and substantive strategies are highly likely to be "infused" by affect. The direct access and motivated strategies, given their reconstructive character, are assumed to be more impervious to this influence.

---

[6] The affect infusion hypothesis aims to account for all the empirically supported but often contradictory assumptions of the other models. It does so by extending the number of assumptions incorporated into the model. It extends the number of processes through which a judgment can be achieved. It considers both the cognitive and the motivational mediation of mood effects. It assumes that mood can have not only an indirect but also a direct effect on processing mode selection. And finally it hypothesizes that mood effects can be moderated by a wide set of different contextual variables. The model thus offers a complete explanation of all possible effects that might be associated with mood. Because of that, however, it lacks parsimony.

Challenges to current explanations of the MIPE

Theoretical and empirical controversy

All the models presented here attempt to explain why mood exerts an impact on how information is processed. However, they do not agree on either the nature of this impact or the mechanisms that explain it.

One reason for the lack of consensus about the nature of the MIPE is the fact that these models rely on different procedural assumptions. Some models (the resource allocation hypothesis regarding positive mood, the hedonic contingency hypothesis, and the affect infusion hypothesis) clearly adhere to a dual process perspective by assuming that information can be dealt with by two distinctive processing modes. One of these modes is more analytic and effortful, whereas the other is more superficial and quicker. Other models (the positive priming hypothesis, the resource allocation hypothesis regarding negative affect and the cognitive tuning hypothesis), although assuming that mood states are related to different processes, do not adhere to such a dualistic perspective. A second reason for lack of consensus among definitions of the MIPE arises from that fact that some models do not associate a specific mood state with a specific way of processing information. Those models (the hedonic contingency model and the affect infusion model) view mood effects as contingent on the situation. All other models generally agree that positive mood is (at least by default) associated with less demanding processing. However, even for these models there is no agreement about how individuals in negative moods process information. Only a subset of models theorize about negative affective states, and they disagree about the relation between negative affect and processing. Whereas Ellis and Asbrook‘s (1988) model associates negative mood with less extensive processing, both the positive priming model and the cognitive tuning model associate this mood state with more extensive processing.

Our understanding of the MIPE does not gain clarity when we consider the relevant empirical data. Generally, it has been shown that individuals in a good mood, in contrast to those in a neutral mood, tend to adopt simpler strategies, pay less attention to particular details of the situation, and rely more on heuristics and previous knowledge structures as bases for their judgments (see Mackie et al., 1992; Schwarz et al., 1991; Sinclair & Mark, 1992, for reviews). However, the hedonic contingency approach has also shown that in non-threating situations even happy individuals engage in more analytic processing (Wegener, Petty, & S. M. Smith, 1995). Martin and colleagues' (Martin, Ward, Achee & Wyer, 1993) results also suggest that the connection between mood and processing is context-dependent. That is, it is dependent on how the context defines processing goals. Happy participants with no explicit goal or with a "good time to stop" goal spend less time than sad participants on a current task. However, with an enjoyment-related processing goal those participants in happy moods spend more time than those in sad moods on the task. The data associated with negative affect is even more controversial. Moderately negative mood states have been repeatedly shown to make analytic processing more likely (see Mackie et al., 1992; Schwarz et al., 1991; Sinclair & Mark, 1992, for reviews). However, in two different studies sad individuals have performed similarly to happy individuals (Oasksford, F. Morris, Grainger, & Williams, 1996; Stroessner & Mackie, 1992). Studies involving depressed individuals suggest that negative affect is unlikely to improve analytic performance (see Clore et al., 1994; Hartlage et al., 1993 for reviews). The controversy surrounding all these data seem to be associated with four kinds of factors: 1) lack of precision regarding the specific requirements of the specific tasks for which mood effects have been demonstrated (Clore, et al., 1994); 2) lack of definition of contextual variables that can override (moderate) mood effects (e.g. instructions and setting are themselves able to activate competing processing goals); 3) lack of precision regarding the specific characteristics of mood states which differentiate them from other affective states; and 4) a uni-dimensional view of mood that focuses only on valence while ignoring possible effects of other attributes (e.g., intensity). It is thus essential that new theoretical or empirical approaches give more attention to these factors.

The mechanisms to which each of the presented models attribute the MIPE differ in their moderation and their mediational assumptions. Both the affect infusion model and the hedonic contingency model explicitly assume situational factors as moderators of the impact mood has on information processing. The perception of a task as depressing or uplifting seems to cause different degrees of analysis in happy and sad individuals, as was demonstrated by Wegener and colleagues' (1995) second study. In that study, happy individuals engaged in analytic processing when the task content was uplifting and sad individuals engaged in deeper analysis when the task was depressing. Other models are less clear about their moderation assumptions. Although they don't consider moderator variables to be fundamental, they sometimes posit them as factors that can short-circuit the expected relation between mood and mode of processing. For example, from the perspective of the cognitive tuning function ascribed to mood, the "assumed impact of affective states on individuals' spontaneously adopted processing style may be overridden by currently active processing goals" (Clore et al., 1994, p. 389). A similar position is assumed by Mackie et al. (1992) in that motivation can overcome at least some capacity deficits. In line with this assumption individuals in happy moods were found to process persuasive messages more deeply when explicitly instructed to pay attention to the quality of presented arguments (Bless, Bohner, Schwarz, & Strack, 1990).

With regard to the mediational issue, most of the model assume that mood's impact on how information is processed is mediated either by capacity or by motivational factors or by both. The idea that positive affect reduces the cognitive resources available for processing has been supported by demonstrations that providing happy people with more time to deal with information allows them to process as systematically as people in neutral affective states (Asuncion & Lam, 1995; Mackie & Worth, 1989). Other empirical evidence suggests that the heuristic processing characteristic of those in happy moods is triggered by decreases in motivation, rather than ability. Supportive research demonstrates that happy individuals do engage in systematic processing when extra incentives are given (Bless, et al., 1990; Bodenhausen, Kramer, & Susser, 1994) or when such processing is expected to increase, rather than detract from positivity (Wegener, Petty, & S. M. Smith, 1995).

Mood as a direct effect

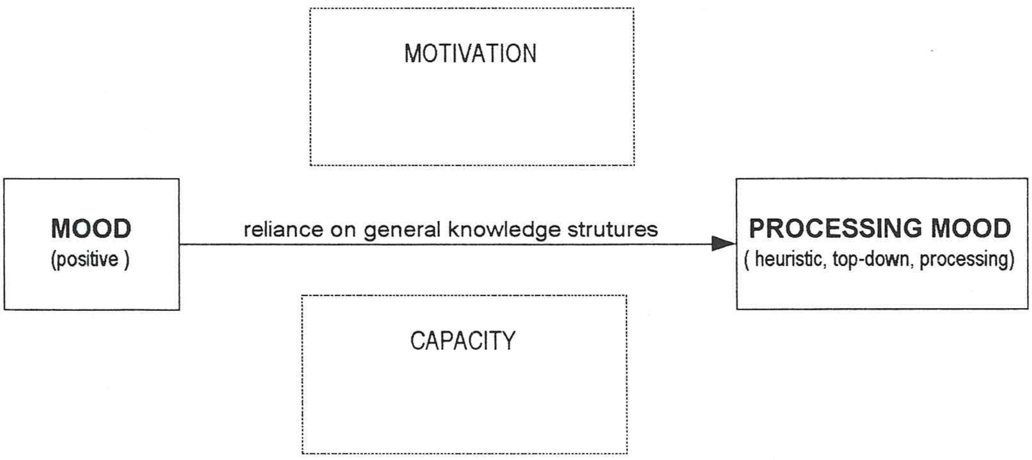
All the hypotheses described above consider the MIPE to be an indirect effect. The impact of mood on information processing derives from its impact on motivational and/or capacity factors. However, a recent conceptualization considers the possibility that this effect is direct. That is, mood impacts directly on information processing.

Mood-and-general-knowledge hypothesis

The mood-and-general-knowledge considers positive mood as having a direct impact on individual's reliance on general knowledge structures. Isen's (1987) theoretical work contains some suggestion that positive affect may increase reliance on intuitive decision strategies and judgmental heuristics. Mackie and colleagues (1992) also hypothesize that *subjective certainty* plays a mediational role in mood effects. The tendency of subjects in positive moods to rely on simpler pieces of information "would also occur if positive affect increased subjects' subjective certainty" (Mackie et al., p.262). However, these different authors do not make identical suggestions regarding the possible impact of positive affect on degree of confidence. The two last approaches focuses on confidence about the output of processing and the fist one on the degree of confidence necessary to produce an output. Bless's mood-and-general-knowledge hypothesis (1994 cited by Bless, Clore, Schwarz, Golisano, Rabe, Wolk, 1996), is not related to individuals' confidence about processing output, but rather to their degree of confidence regarding a particular type of processing. Bless argued that to the extent the current psychological situation is evaluated as benign, it would be highly adaptive for individuals to rely on their general knowledge structures. These general knowledge structures are highly organized memory entities which are able to synthesize the relevant features of the stimuli, allowing efficient inferential activity and quick responses (see Markus & Zajonc, 1985 for an overview). Although their activation can provide efficient responses, they can also be prone to error. The mood-and-general-knowledge hypothesis considers positive mood as having a direct impact on an individual's reliance on these general knowledge structures. Bless et al. (1996) make this hypothesis explicit by saying: "Benign situations may invite top-down processing with considerable reliance on preexisting general knowledge structures, whereas problematic situations may invite bottom-up processing, with less reliance on general knowledge structures“ (p. 666).

The mood-and-general-knowledge hypothesis assumes neither a capacity nor a motivational mediation of mood’s effect on processing. It expects mood to affect neither the amount of processing nor its depth. Instead, mood is argued to have a direct effect on the subjective confidence associated with the use of general knowledge structures, which typically entails more simplified processing of information. The hypothesis of reliance on general knowledge structures is not related to any effect that mood might have on general feelings of optimism, efficiency, or willingness to take risks. Positive mood simply signals both that the environment is safe and that processors can rely on general knowledge, and hence do not need to elaborate on the details of available information.

Figure 1.7: The Mood - and - General Knowledge hypothesis (Bless, 1994; Bless, Clore, Schwarz, Golisano, Rabe & Wolk. 1996).



Although this hypothesis suggests that positive mood may well be associated with top-down processing and negative mood with a bottom-up processing, the authors do not frame their hypothesis within a dual process view (Bless et al., 1996). Thus, although the hypothesis is consistent with a dual processing view of the mind, it does not depend on it.

Independent of mood effects, motivational and capacity factors are also expected to influence the level of reliance on general knowledge structures (in line with what is assumed by Fiske & Neuberg, 1990; Kruglanski, 1989). "Depending on the relative contributions of the affective state and processing motivation and capacity, mood effects may not always be observable ..." (Bless et al., 1996, p.677). Other factors are also hypothesized to influence the relation between a mood state and mode of processing. Special attention is given to affective intensity, framed in terms of arousal. An increased reliance on general knowledge structures is also expect to result from either very high or very low arousal (consistent with what is shown, for example, by Bodenhausen, 1990; Kim & Baron, 1988).

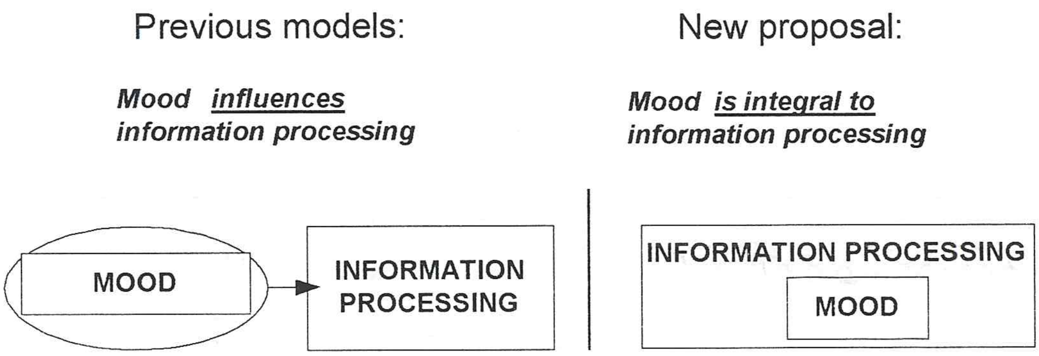
To support the mood-and-general-knowledge hypothesis Bless and colleagues (1996) presented evidence that happy participants engage in heuristic processing even while suffering no motivational or cognitive deficits. In their study, happy, neutral, and sad participants listened to a highly script-consistent story about dining out in a restaurant. At the same time, they were asked to complete a secondary task. A later recognition test indicated that compared to others, happy participants relied on a general knowledge structure (that is, an "eating out" script) to organize the information in the story. Yet, their superior performance on the secondary task also indicated that this reliance was not due to lack of motivation or capacity.

In sum, the research literature offers mixed theoretical and empirical support for most of the explanations of happy individuals' proclivity to process non-analytically. The existence of data that both refutes and supports each model may mean that none of the models identify all of the variables that are relevant to the effect, even though some critical variables have been identified. Given the lack of consensus among the models regarding the critical variables, adding yet more variables to the models seems to be conceptually formidable and lacking in parsimony. Alternatively, it may be that a new model and explanation of the MIPE is necessary, as none of the current models explains the effect adequately. Thus, in this dissertation I present an alternative way of conceptualizing and explaining the impact of positive mood on information processing.

A new proposal: Mood-as-regulation-mechanism

Instead of assuming that mood influences information processing (as do all other current explanations), the mood-as-regulation-mechanism hypothesis assumes that mood is integral to information processing.

Figure 1.8: Mood as conceptualized by previous models and by the mood-as-regulation-mechanism hypothesis .



Previous theories conceptualize mood as an internal contextual variable that influences information processing. Mood is understood to be a variable that, although it defines the context within which information is processed, is external to the information process itself. By arguing that mood is integral to information processing, the mood-as-regulation-mechanism perspective argues that mood should not be regarded merely as a variable that is external to information processing but instead as a variable that has a role in information processing, a variable that is integral to and necessary for information processing. The hypothesis is grounded in a dual process model that assumes the existence of two different cognitive computational modes and of circumstances that compel the activation of one or the other of these models (see Chapter II). From this perspective mood has an effect on the way individuals process information, because mood is a mechanism that regulates how information is processed. The system "knows" how to deal with each situation, how deeply or superficially to process it, because each situation first has a direct impact on how individuals feel (see Zajonc, 1980, for a similar argument regarding affective primacy). Individuals engage in deliberative thinking, in an analytic processing mode, because no positive feeling is experienced. The situation is not experienced as a familiar situation. There is no fluency of processing. Fluency gives individuals a positive feeling, a feeling that "everything is all right", that the situation is a familiar situation. The experience of this positive feeling of familiarity is the cue that non-analytic processing is sufficient, and that previously established knowledge structures can be adequately applied to the situation. The positive feeling that accompanies this implicit feeling of familiarity, and that is often consciously experienced as positive mood, is what causes the MIPE.

Plan of the Dissertation

The following chapters of this dissertation describe in more detail both the theoretical assumptions and the empirical foundations of this alternative explanation of the MIPE. The hypothesis that mood is a mechanism that signals how information is going to be processed (i.e., analytically or non-analytically) requires three kinds of supportive argumentation.

First, it is necessary to argue for a dual-processing theory with some specific features. These features include the following: a) individuals make decisions or judgments on the basis of two distinct modes of processing information: either attending to the specific details of a situation and analyzing them carefully and systematically or relying mainly on retrieval of previously acquired knowledge from memory and b) the relational characteristics of these two processing modes imply the existence of a regulation mechanism. In order to support this claim, Chapter II analyzes the evidence for the dual processing assumptions, as well as the need for and the nature of a mechanism that might regulate dual processing. Some of the dual processing models offered in the cognitive and social cognition literature are compared and contrasted. Special attention is given to the way in which these different approaches conceptualize the relation between the two processes they posit and whether or not they require a regulation mechanism. Some regulatory theories are presented and the concepts to which they attribute a regulatory role are discussed.

Second, mood needs to be defined as a variable whose characteristics are compatible with the idea of a regulation mechanism. Chapter III tries to clarify the meaning of the concept of mood and its effects on information processing in order to compare them to those assumed as necessary for regulation. Empirical evidence associated with the effects of mood on processing mode selection in a number of different fields of research are fully reviewed. Together they help us not only to define the nature of the MIPE, but also to understand some characteristics that must be taken into account by a model which aims to explain it.

Third, it is necessary to draw some parallel between mood and other variables, such as familiarity, hypothesized to work in a regulatory fashion. Chapter IV focuses closely on the role of familiarity in information processing and the relation between mood and familiarity. It is argued that the positive feeling that accompanies the implicit feeling of familiarity is often consciously experienced as positive mood, and so that mood's regulatory role arises from the fact that positive affect is integral to implicit familiarity. The positive affect integral to the feeling of familiarity is then what drives the MIPE. After describing the basic tenets of the mood-as-regulation-mechanism approach, Chapter IV draws out some of the approaches' unique implications.

Chapter V presents empirical evidence relevant to the mood-as-regulation-mechanism hypothesis. Because of my characterization of positive mood as playing a regulatory role, a crucial first step in establishing the viability of the model is the demonstration that the implicit feeling of familiarity (as studied in the cognitive literature) is a positive feeling and that familiarity and positive mood have interchangeably identical effects on information processing. Four experiments were designed to test the ideas that a) manipulations of the feeling of familiarity trigger changes in reported mood, b) manipulations of mood have the same effects on conscious judgments as do manipulations of a feeling of familiarity, and c) mood and implicit familiarity have identical effects on information processing. The implications of this data for the new proposal together with a critical analysis of the mood-as-a-regulation mechanism hypothesis are then discussed in Chapter VI. In this chapter, I consider and discuss the model's relevance, its relation to other approaches, and its fruitfulness for the field.

CHAPTER II :

Analyzing the Mind

Human information processing: the dual process view

The mood-as-regulation-mechanism hypothesis is grounded in a dual processing assumption. It assumes the existence of two different cognitive computation modes and of circumstances that compel the activation of one or the other of these modes: a regulation mechanism.

To substantiate the viability of the mood-as-a-regulation mechanism hypothesis, this chapter has three primary aims. First, it provides evidence that a dual processing view of the mind is both viable and consensual. Second, it demonstrates the need for a mechanism that regulates activation of these dual processes. Third, it provides evidence that the most likely regulatory mechanism is some kind of "feeling."

The dualistic view

The mood-as-regulation-mechanism hypothesis, in concordance with several dual process models, assumes that *the mind is dualistic* [1]. These dual process models have been developed in different fields of psychology. Their emergence was triggered by attempts to account for a number of apparent discrepancies in how individuals react to exactly the same stimuli under different circumstance. Generally speaking, individuals making a decisional, evaluative, or recognition judgment seem either to rely on their intuition about the proper response, or to elaborate on what the proper content of the response should be. The distinctive nature of the processes by which an "intuitive" response compared to an "elaborative" response emerges argues for the necessity of dual processing conceptions. In some circumstances individuals are even able to notice a discrepancy between the "intuitive" and the "elaborative" responses that appear to occur simultaneously in response to the same stimulus (Sloman, 1996). Research in different fields has demonstrated that each process can be impacted in different ways by the very same variables, making the idea that different reactions are related to two distinctive processing modes even more compelling. Thus the different nature of each process, the evidence of their simultaneous occurrence, and their functional independence all appear to corroborate the need for assuming the existence of two distinctive modes of processing information (Tulving, 1983).

Although some dual process approaches consider the two processes to be implemented in one and the same processing system, others claim that the two modes

[1] In this dissertation all theoretical views of the mind that postulate that information processing can be done by two distinctive routes, whether integrated in the same system or in two more or less independent systems, are defined as dualistic. Dualistic approaches should not be confounded with the idea that "mind" and "brain" are two independent units.

of processing information are grounded in distinct processing systems [2]. The criteria used to distinguish *dual systems* and *dual processes* approaches are, however, not clearly defined. In the memory literature it is generally assumed that a claim for two distinct representations characterizes a dual systems approach, whereas a claim for a single representation underlying each process characterizes a dual process approach (Richardson-Klavehn & Bjork, 1988). However, Schacter and Tulving (1994) don't call out attention to this difference in the three criteria they argue define the claim for different memory systems: a) existence of class-inclusion operations and domains, b) differences in basic properties (rules of operation, kind of information[3], and neural substrates), and c) presence of convergent task dissociations. Nadel's (1994) two system definitional criteria (different neural architectures with computational differences and length of time information is stored) also does not define representation as the criterion for system distinction. Moreover, several dual process theories distinguish memory representations associated with each process while maintaining a view of processing as a unitary system (see below). The basic assumptions of the mood-as-regulation-mechanism hypothesis are compatible with

---

[2] Both these kinds of dual process approaches must be distinguished from dual stage models. Dual stage approaches agree that two processes exist, but see them as sequential processing stages, with the output from the first stage serving as the input for the second stage. Dual stage models have been generated in different fields of research. In the domain of person perception, Gilbert and his associates (Gilbert & Krull, 1988; Gilbert, Krull, & Pelham, 1988) suggest that the availability of processing resources can induce perceivers to make dispositional or situational inferences, since the first is a quicker, less effortful process and the second a more effortful one that includes discounting of the initial inference. Devine's (1989) model of suppression of stereotypic thoughts represents a dual stage processing model of person perception, where the first stage is characterized by an automatic activation of well-learned associations and the second by more effortful and belief-congruent processing.

[3] Kind of information refers to the distinction between the "factual information about the world in the broadest sense. The knowledge and beliefs about the world that people gain, possess, and use - whether general or specific, concrete or abstract..." and information "about experienced events as embedded in a matrix of other happenings in subjective time" (Schacter & Tulving, 1994; p.28).

either a one system or a two system version of a dual process approach[4]. Hence, my use of the terminology of dual process must not be thought of as having any implications for the existence of one or two distinctive processing systems .

Dual process models of mind: definitional issues

Many different concepts and terms have been used in the cognitive and social cognition literatures to try to capture the nature of each of the dual processes. Together these terms help to define each process and differentiate it from the other. Before analyzing some of the most relevant dual process models, I define the dimensions considered to be most relevant to distinguishing the nature of the two processes and the relations between them.

Nature of processing

Dual process models differentiate processing modes by reference to three related procedural features synthesized in the following question: *What assumptions are made regarding **control of the process** (conceptual versus*

[4] The mood-as-regulation-mechanism, however, is incompatible with dual-stage approaches for two related reasons. First, it assumes that exactly the same information can be processed in alternative ways. Second, and more important, the fact that dual stage processes operate sequentially eliminates the need for a regulation mechanism.

data-driven); ***direction of the process*** *(top-down versus bottom-up), and/or* ***level of the process*** *(perceptual or conceptual)?*

Control of processing in this question is related to the distinction between conceptual and data-driven processes. This distinction emerged in parallel to the distinction between top-down and bottom-up processing, drawn originally in the reading literature (Bobrow & Norman, 1975; McClelland & Rumelhart, 1981; Norman & Rumelhart, 1975; Roediger & Blaxton, 1987). Since then, different models (network models, schematic models, and exemplar models) have incorporated both pairs of concepts without any clear articulation. Not only have the two pairs of concepts been used with either the same or a different meaning, but there also seems to be no general consensus in the meaning attached to either distinction. It is thus necessary to make clear how they are interpreted here.

According to Johnston and Hawley (1994) the terms **conceptual** and **data-driven processing** have a meaning associated with *the flow of information processing control* and the terms **top-down** and **bottom-up** refer to the *flow between lower and higher layers of informational nodes.* Data-driven processing is guided and determined by stimulus information currently received by the sense organs, whereas conceptually-driven processing is guided by prior knowledge of information stored in memory. When cognitive processing is data-driven, the information is essentially flowing from lower levels to higher levels of knowledge: a bottom-up process. When cognitive processing is conceptually-driven, the information flows essentially from higher to lower levels: a top-down process. A cognitive process is designated as bottom-up if there is a low-level analysis of sensory inputs that is built upwards towards higher levels. The process is designated as top-down when it begins with higher level processes that generate expectations and hypotheses relating to the interpretation and evaluation of the sensory input.

The framework proposed by Johnston and Hawley (1994), although making clear one way of distinguishing between the two pair of concepts, does not clarify all the confusion associated with them in the literature. The differentiation between conceptual and data-driven processing also has another meaning in the literature. Instead of focusing on the direction of process flow or on the locus of process control, this additional meaning describes *different levels of analysis*: low level or peripheral perceptual activity versus higher order cognition (see, for example, Jacoby, 1983; Roediger, 1990; Yonelinas, Regehr, & Jacoby, 1995). Data-driven processes are taken to be **perceptual processes**, that is, processes that analyze the stimulus input at a perceptual or lower level of analysis (such as features, letters, word units, modality, typeface, etc.). **Conceptual processes** include analysis at a higher level of abstraction, usually at the semantic level. In this view, conceptual processing refers to the access or creation of links between different "items" of stored information, and so it is related to elaboration (see later; E. R. Smith & Branscombe, 1988). Another somewhat related but different view considers data-driven processing as analyzing stimulus input (without reference to a specific level of analysis), and conceptually-driven processing as analytic processing which provides contextual, linguistic, and situational knowledge (i.e., analyses that go beyond the present stimulus situation; Jacoby, Levy, & Steinbach, 1992).

It must be made clear that the original definition of these terms (e.g. McClelland & Rumelhart, 1981) did not stress these differences among control, direction, and level of analysis of information processing. It was assumed that as processing is initiated, the two kinds of processes (higher and lower level) work simultaneously and in conjunction to provide a multiplicity of constraints that jointly determine what is perceived. However, the dominance of one level of analysis at that initial step determines a preferential direction of activity which "controls" subsequent steps. In fact, since most tasks were assumed to require a mixture of both types of processing, authors such as Srinivas and Roediger (1990) suggested that the distinction should not be associated with a discrete dichotomy but instead with two continua: one reflecting the amount of data-driven processing required and other reflecting the amount of conceptually-driven processing required. Although McClelland and Rumelhart's (1981) use of the terminology is clear, its exportation to other fields seems to call for further clarification, such as the one suggested by Johnston and Hawley (1994). However, distinguishing among control, direction, and level of processing by using correspondingly different terms is far from universal. The top-down and bottom-up distinction is usually used in referring to the level of analysis or direction of the flow in purely cognitive models and to processing control in social cognition models.

A second important dimension on which dual process models may differentiate processing is their degree of awareness and intentionality. The question to be asked is thus: *Are there any assumptions about the conscious-unconscious or automatic-controlled nature of each process?*

The distinction between **conscious** and **unconscious** processing, although used frequently in the social cognitive and cognitive literatures, remains very controversial. Two major points are apparently consensual: a) the conscious versus unconscious dichotomy actually corresponds to a continuous dimension along which different processes can be placed, rather than to two discrete processes and b) awareness also varies continuously, in the sense that human information processors can be aware of fewer or more of the features of any given cognitive process. Thus, for some models the unconscious versus conscious distinction corresponds to the awareness versus non-awareness dichotomy (Cheesman & Merikle, 1986; Johnson & Reeder, 1997; Reber, 1989; Shiffrin 1997). A fully conscious process would imply full access to all of the process features and thus ability to verbally report on it. Such an extreme condition is, however, very unlikely to exist. Thus, a process is considered to be conscious if the human information processor has some degree of awareness a) of the stimuli being processed, b) of its context, and c) of the very act of processing (perceiving, interpreting, categorizing, or evaluating) the stimuli. The steps, algorithms, or influences defining the particularities of each process require a further level of consciousness, not commonly assumed by default. At least some attentional resources are a prerequisite for conscious processing. However, resource availability is not sufficient *per se*. Nor is their mobilization and investment in the cognitive task. Although necessary, they do not guarantee awareness of all, or even most, of the features of the current cognitive task (Shiffrin, 1997).

The conscious versus unconscious dichotomy is frequently associated with other dichotomies and in particular with the conceptual distinction between automatic and controlled processes. The temptation to map these distinctions onto each other is, however, to be resisted[5] (see, for example, Jacoby, Toth, Lindsay, & Debner, 1992; Jacoby, Yonelinas, & Jennings, 1997; Shiffrin 1997), as conceptual ambiguity is

---

[5] Some of the reasons for objecting to such equivalence are analyzed by Shiffrin (1997). His conclusions were that, despite the overlap of classification of processes, there is no good case for relating those two distinctions - "the mapping between the characteristics of the two conceptual frameworks is quite poor" (p.63). In fact, if awareness seems to be a necessary criterion for controlled processing, its absence is not necessary for defining a process as automatic (see later).

associated with the definition of both distinctions. The ambiguity that is associated with the distinction between an **automatic** and a **controlled** process has been consensually attributed to the lack of agreement about the criteria sufficient for defining automaticity. Four criteria have been used, either as providing a set of necessary and jointly sufficient conditions for automaticity (Johnson & Hasher, 1987), or as providing cumulative evidence suggesting "more" automaticity as "more" of these conditions are obtained (Kahneman & Treisman, 1984; Logan & Cowan, 1984). These criteria are: intentionality, awareness, cost in attentional resources, and controllability (Bargh, 1989; 1994). Trying to overcome the often-encountered ambiguities associated with the evidence of automaticity, Bargh (1994) suggested its decomposition into these four components. In addition, he urged researchers to be more specific about the components they referred to when they endorsed theoretical claims for automaticity. The most generally used criterion for automaticity is *efficiency*. By efficiency it is meant that automatic processes require fewer attentional resources than controlled processes (i.e., automatic processing does not require any sizable share of the limited processing resources available, whereas the opposite holds true for controlled processing). Moreover, efficiency means that automatic processes run more quickly than any controlled process. Automatic processes can be activated in at least two different circumstances. First, they can be activated in circumstances characterized by a lack of intention and a lack of awareness of the processes which produce a specific output. Second, they can be activated in circumstances characterized by intentionality and awareness of that process (Bargh, 1996). The first set of circumstances defines a *preconscious form of automaticity* that occurs immediately upon perception of the triggering stimulus event. The second kinds of situations define a *goal dependent automaticity* that, although requiring intention to be initiated, do not involve conscious guidance once triggered (Bargh, 1996). Only the output of preconscious-automatic processes is subject to control (being accentuated, inhibited, compensated, and so forth). In contrast, an automatic process that is goal dependent can be subject to several controlled influences: it can be interrupted or consciously changed or even carried out, at least partially, as a non-automatic routine. A fully controlled process requires conscious guidance at every step, which makes it highly demanding of cognitive capacity. Much of human behavior can be understood to be basically under conscious control: conscious control exercised over the output of an automatic process and conscious control of the process flow itself (when an output can be achieved via either an automatic routine or as a step-at-a-time controlled process).

Processes may also be distinguished on a third dimension: their "depth" of processing. The concept of depth of processing (Craik & Lockhart, 1972) had its origins in the theoretical framework of the so called "levels of processing" approach. Later it gave rise to two very different processing concepts: the concept of **distinctive** (individualization) processes and the concept of **organizationally** centered (elaboration) processes [6]. Thus, a process may be thought to be centered either around the unique features of the stimulus or around the relational features of the stimulus. The question to be asked, in the analysis of a dual process model, is then: *Are there any assumptions about whether either process implies organizational or distinctive analyses of the stimuli?*

[6] Elaboration as a synonym for an organizational process must not be confounded with other uses of the same term within other theoretical frameworks. In the persuasion literature, elaboration means deeper processing - a process that implies a careful analysis of the stimuli's content and properties, either in terms of their specific or relational (with other memory information) attributes.

The distinction between distinctive and organizational processing[7] has been used to characterize several basic cognitive activities. For example, the concept of distinctiveness offered a plausible explanation for better memory performance in semantic compared to non-semantic orienting tasks (Craik & Jacoby, 1979; Craik & Tulving, 1975; Eysenck, 1979; Hunt, 1995; Hunt & C. L. Elliot, 1980; Lockhart, Craik, & Jacoby, 1976). Processing and encoding were conceptualized as either centered around the specific attributes of the stimuli or not. Distinctive processing (and encoding) is processing centered on specific distinctive attributes, such as the attribute "big". Organizational processing (and encoding) is processing centered on relations, such as the relation "bigger". Therefore, organizational encoding implies a comparison of stimuli presented in a spatio-temporally bound episode with overlapping dimensions (attributes that can be shared or contrasted). Focusing on the relationship between items, rather than on each item's uniqueness, constitutes an elaborative encoding process that presupposes attention to information that is not directly useful for item retrieval (Hunt & R. E. Smith, 1996). Consequently, it does not favor the retrieval of an item attribute (that could function as a cue for retrieval of the item) but instead favors the retrieval of any element of the relational set (which can function as a cue for retrieval of any element of the item category).

[7] Since this distinction is closely related to the "levels of processing" framework, it has some things in common with the distinction between data driven and conceptually driven processes (used in a "level of analysis" sense, see previous section). From this perspective, conceptually driven processing corresponds to more organizational/elaborative processes, and data-driven processing to more distinctiveness-based processes, centered around unique stimulus features. The problem with this mapping is that both perceptual and semantic characteristics of the stimuli can be encoded either by organizational or distinctiveness processing. Alternatively, adherence to a control framework for the conceptual versus data driven dichotomy does not allow for a direct relation between this and the organizational versus distinctive conceptual pair.

A fourth dimension that seems to be relevant in defining the nature a process is its level of productivity (Sloman, 1996; E. R. Smith & DeCoster, in press). Dual process models may or may not differentiate modes of processing by answering to the question: *Is one process essentially reproductive and other essentially productive?*

The dual concepts of "**productive** versus **reproductive**" are defined as principles of computation by William James (1890). Used mainly in linguistic approaches (e.g. Chomsky, 1968), the concepts were resurrected by Fodor and Pylyshyn (1988) and brought to dual process frameworks by Sloman (1996). A process is said to be essentially reproductive if it activates the result of past experiences as a response to the current one. A reproductive process deems the situation as "the same" or "similar" to a previous one and "reproduces" the same reaction. Productivity of a process refers to the possibility of constantly generating new sets of answers. If a mode of processing deals with each situation as a new one, to which a particular response must be computed on the bases of information received and activated in memory, it must be considered a productive process.

There are several other aspects of processing that, although providing ways of distinguishing different modes of processing, are not as universally or carefully explored by dual process models as those previously mentioned. For example, processes might be distinguished in reference to the basic operations used in computation: *What are the basic operations that characterize the nature of each mode of processing? How are the bits of information combined to furnish a response?* Many models refer to computation abstractly as characterized by "memory activation" and "use of logical principles". However, other models tend to be more explicit about the nature of their basic operations, referring to the use of principles such as *similarity* and *contiguity* in computation, or to more specific rules of composing stimulus features. Thus, it is relevant to characterize a dual process model by reference to any assumptions made regarding basic operational characteristics.

Similarly, it is relevant to ask if different models have *any assumptions about each mode of processing's basic units (concrete-abstract level, singular-general knowledge, episodic-global traces)?* It may also be argued that the nature of processing is different if dealing with different types of information (Schacter & Tulving, 1994). *Is information related to personal life episodes or to general knowledge and social beliefs?* Thus, an understanding of the genesis of knowledge may also be relevant to definitions of different dual process models (Sloman, 1996, E. R. Smith & DeCoster, in press). *How is information acquired (slowly or quickly[8])? What are the sources of that information (personal experience versus internalization of cultural developed features)?*

The relation between processes

Crucial to the mood-as-regulation-mechanism hypothesis, obviously, is some demonstrated need for a regulation mechanism. Thus the assumed relation between the two processes in various dual process models is important. Relational features can be considered with regard to the pattern of activation and the influence on outcome production of the two processes. This section deals with the issue of how dual process models view the relation between processes, and whether there is acknowledged need for a regulation mechanism.

---

[8] MacClelland, McNaughton, and O'Reilly (1995) argue that the human memory system must meet two demands: to record information slowly and incrementally (schematic memory) and to allow rapid learning of new information (episodic memory). Since learning slowly and learning fast are incompatible, the authors suggest that they must be handled by separate systems.

There are different **conjoint activation patterns** that can be assumed to define the relation between the two processes (see Figure 2.1). Process activation may depend on the "activational status" of the other process or be independent of it. Since in defining the relation between the two processes a dual process model must define their conjoint pattern of activation, the relevant question to be answered in the analysis of these models is: *Are there any assumptions of independence, redundancy, exclusivity, or even simultaneous activation of systems?*

Dependence assumes that process A can only be activated in particular circumstances related to the activation of process B and/or vice-versa. These circumstances can define specific modes of dependence, which make the relation, for example, *exclusive* or *redundant* (see Jacoby, et al., 1997; Jones, 1987). Exclusivity assumes that either one or the other process occurs (if A not B, if B not A). Redundancy assumes that one type of process is only activated as a continuation of the other when some "threshold" is reached. Thus, for one to be activated, the other one has to be activated too (if B, then A). *Independence* assumes that any process or system can occur at any time without any special relation between them (if A then B or not B, if B then A or not A). Independence of activation implies that any process can be activated at any time, and that their order of activation can be commuted. If both processes are expected to be *simultaneously* activated, their activation is dependent upon a third element (a trigger mechanism) and thus their relation is spurious. Since most models that assume simultaneous activation do not consider it necessary, they tend to subscribe to independence. Special types of relations can also be defined when time is taken into account. With a time perspective, mutually exclusive activation might turn into interplay between the systems. Instead of a mere dependence hypothesis, a temporal perspective may give rise to an interdependence hypothesis, where the deactivation of one process gives way to the other and vice versa until an output is produced.

Figure 2.1: Processes conjoint activation patterns

EXCLUSIVITY	REDUNDANCY
IF A $\Rightarrow$ NOT B IF B $\Rightarrow$ NOT A A B	IF B $\Rightarrow$ A IF A $\Rightarrow$ B or NOT B A B
SIMULTANEOUS	INDEPENDENCE
IF A $\Rightarrow$ B IF B $\Rightarrow$ A	IF A $\Rightarrow$ B or NOT B IF B $\Rightarrow$ A or NOT A

Other relevant questions for defining process relations focus on their modes of implementation and the relation between outputs. *Are there any assumptions about the systems being implemented in parallel or sequentially? Is this relation necessary (a must) or optional (a can)? Are there any assumptions about output interaction (A neutralizes B, A intrudes on B, B suppresses A, or are they additive)?*

The assumed relation between the two systems or processes has a number of implications for their **mode of implementation**. If one assumes the activation as exclusive, the idea that both systems can function in parallel is ruled out, and so if they are activated by the same stimuli, this activation must occur sequentially (even if one sequence is expected to be repeated over time - as is postulated in an interdependence assumption). With redundant activation, one process may be activated with the other (but is not necessarily), and so the second process, if activated, would work in parallel with the other. Independence of activation of both types of processes does not imply that they must act in parallel, only that they can. However simultaneous activation implies that both processes are parallel.

In addition, one should avoid equating both the conjoint activation patterns of these two processes and their implementation with the **relation between their outcomes**. The outcomes of processes, whether simultaneously "activated" or not, can interact in many possible ways (e.g., one inhibiting, biasing, or suppressing the other) or make an independent (additive) contribution to a judgment. A mutually exclusive activation can imply that only one output is available, that the output of a process will be an input for the other, or that this sequence will be repeated over time. Independence of activation implies either one or two independent (separated) outputs that might or might not interact in a subsequent step. Redundancy allows for the existence of an unique output (from one unique process) or two distinctive outputs that can interact subsequently. The simultaneous activation of both processes suggests an independent influence of each one on subsequent judgments that also might or might not interact in a subsequent step.

For the purposes of this dissertation a crucial relational question is: *When and how is one process expected to "predominate" over the other?* Related issues are *whether there are any assumptions about the processes' relative priority and weight (one before the other, one quicker than the other, one more reliable than the other)*?

It can be assumed that a) both processes will always contribute either independently or interdependently to an outcome, b) in some circumstances (a set of personal or situational variables) one process will be preferred to the other (external constraints will determine which will predominate), or even that c) some mechanism that is integral to the information processing system gives primacy to one or the other process. This mechanism in turn can act in three different ways: 1) it can select outputs; 2) it can inhibit a process (for example, the output of one process inhibits the production of the other) or 3) it can activate a process (for example, a variable that initiates specific processing activates one or both processes). Only the last two cases can be called process regulation-mechanism issues. However, only the last one stresses the regulation issue focused on by the mood-as-regulation-mechanism hypothesis. These issues will be raised again later when regulation is discussed in more detail.

Dual process models in cognitive and social cognition psychology

The idea that the mind is dualistic has been developed more or less independently in both the cognitive and social cognition fields of psychological research (see Abelson, 1994; E. R. Smith, 1994; E. R. Smith & DeCoster, in press; for reviews). The fact that both fields share the same view is some of the best evidence for the viability of two process models, and the plethora of models developed in both fields suggest that the dual perspective is highly fruitful. In order to demonstrate both how widespread and varied the dual perspective is, I next review the major relevant dualistic approaches to judgment in these two fields.

The selected models were chosen as the most representative approaches with a judgmental/decisional component developed either in cognitive or social cognition psychology fields (see also, Epstein, 1994; E. R. Smith, 1994; Sloman, 1996, for a review of these approaches). I will analyze how each dual process model defines the nature of each process in reference to the concepts defined in the previous section. The review is summarized in Table 2.1.

Some of the most relevant dualistic views of human information processing have been developed in two different domains of social cognition: persuasion and person perception.

In the **persuasion** field, the *Heuristic-Systematic Model* developed by Shelly Chaiken and her collaborators offered a clear distinction between two ways of processing persuasive information (Chaiken, 1980; 1987; Chaiken & Eagly, 1983; Chaiken, Liberman, & Eagly, 1989; Eagly & Chaiken, 1993). The distinction between *systematic* and *heuristic* processes emphasizes that a person's response to a persuasion message can be determined either by the content of the message itself (both its specific unique characteristics and the information these characteristics activate in memory) or by some more general (procedural or declarative) knowledge structure activated by its presentation. Systematic processing implies a full assimilation of the semantic content of a message by involving processing at the upper end of a feature-seeking/analysis/integration continuum[9]. It is a controlled and intentional processing mode that demands relatively high levels of cognitive capacity. Heuristic processing is described as a cognitive mode that relies on the use of simple,

[9] The model assumes such information integration without describing how it happens. That is, no mechanism or integration rule is presented.

well learned, and frequently activated inferential rules, or schemas, previously stored in memory. Thus no mobilization of attentional resources to the semantic content of the message is implied. Because heuristic processing is less resource demanding, it may involve little effort, intention, and/or awareness.

As the model subscribes to bounded rationality views (Simon, 1969), the less effortful mode of processing is generally preferred (and so benefits from priority of activation). Thus, if an heuristic solution is available, it will be the preferred path to judgment. Heuristic processing is expected to be overridden by more elaborative processing outputs only if it confers insufficient judgmental confidence. When heuristic processing leads to insufficient judgmental confidence, both modes are expected to co-occur. This concurrent processing assumption encompasses the idea that both systems can exert interdependent (interactive) or independent (additive) effects on judgment. Systematic processing is expected to attenuate the judgmental impact of heuristic processing if their outputs are contradictory, or to add its contribution to the heuristic processing outputs if they are not contradictory. However, the assumption that systematic processing will occur only if a more cognitively economical alternative is not available or if that alternative fails to bring about the desired outcome suggests *dependency* between the two systems. Systematic processing activation seems to be dependent upon an "unsuccessful" output of the heuristic process or the expectation that that output will be "unsuccessful". Thus, systematic processing is activated only in parallel with heuristic processing and never alone, logically defining a relationship of *redundancy*.

The Heuristic/Systematic Model of persuasion subscribes to the so-called *sufficiency principle* which holds that people will exert the minimum effort required to attain a sufficient degree of confidence (a *sufficiency threshold*) in their cognitive output. This explains why heuristic processes are given priority in the model. If the desired threshold is not attained, more elaborated processing of the data and all its specific characteristics will be activated, since systematic processing is expected to offer a higher level of confidence (Chaiken, W. Wood, & Eagly, 1996). In addition, this sufficiency threshold is expected to vary as a function of individual differences and situational factors. Heuristic processing is governed by the set of principles usually associated with the activation of memory information: availability and accessibility of relevant heuristics. Cues presented in the persuasion setting and the processing goals activated in that setting are examples of variables expected to influence activation of heuristics. Capacity and motivation are important determinants of the type of process subjects engage in because they directly influence the *threshold* necessary for the activation of a more analytic response to the information. Motivational factors are expected to override theory-driven effects by raising this threshold and so encouraging perceivers to engage in a more data-driven or systematic approach (Eagly & Chaiken, 1993). Although this model was developed in the persuasion field, Chaiken and colleagues (1989) suggested its applicability to social judgment and decision making in general.

Another dual process developed in the persuasion field is the *Elaboration-Likelihood Model* (ELM) of Richard Petty and John Cacioppo (Petty & Cacioppo, 1981, 1986). The model is a dual-process model since it postulates that individuals can process persuasive messages in two different ways: by attending carefully and thoughtfully to their true merits or by attending to some simple cue present in the context. In the first case individuals are said to follow a central route to persuasion and in the second case a peripheral route. The careful scrutiny of relevant information and consequent amount of issue relevant thinking is called elaboration (Petty & Cacioppo, 1986, p.7; Petty, Haugtvedt, & S. M. Smith, 1995, p.94), and the model postulates that the likelihood of elaboration can vary widely across situations and persons. Although the authors claim that central and peripheral routes are the opposite ends of an elaborative processing continuum, they also claim that they represent two qualitatively distinct processes with one implying high elaboration and the other implying attention to peripheral cues. Peripheral cues refer to any stimuli other than persuasive message content that can induce attitude change.

The main focus of the ELM has not been the procedural characteristics of each process, but instead the conditions that affect elaboration likelihood (high ability, capacity, and high motivation). However, this model has been repeatedly defined by other authors as a dual-process model (e.g. Eagly & Chaiken, 1993; E. R. Smith, 1994). This is because the model postulates that individuals can be persuaded to change their evaluation of an issue/object by attending to two qualitatively different informational sources: intra-message and extra-message information. Each of these distinct sources of information is used to define a different mode of processing. One process is defined by the fact that attention is paid to message content and issue-relevant information. The other process is defined by the fact that more attention is paid to contextual or extra-message information cues. A relevant question is thus whether degree of attention to information content can be considered a good criterion for differentiating two types of information processes? If we accept content of processing as a valid criterion to distinguish between processing modes, we would be faced with a plethora of such modes. Does the ELM refer to any other differentiation criterion? Only one: the degree of complexity in the mental structure encoded as output. Both central and peripheral processes are grounded in the same representational memory system (attitudes are schemas), but their output differs in complexity. If attitudes change because individuals elaborate message content, integration of issue-relevant information into the attitude object schema is expected. When the peripheral route is used, the schema will be accessed only to incorporate the evaluation induced by a peripheral cue. Petty and Cacioppo (1986, p.15) are explicit in saying that the crucial dimension to distinguish the two processes is *elaboration*, and that this dimension should not be confounded with any of the other dimensions usually associated with different processes such as effortful versus effortless, controlled versus automatic, top-down versus bottom-up, organizational versus distinctive processes and so on. The ELM does not theorize about the specific characteristics of and relations between the two processes. Its focus had been on describing the hypothesized continuum of elaboration likelihood and on the conditions that can affect it. In its original presentation (Petty & Cacioppo, 1981) the ELM was a "general framework to understand the processes postulated by the different theoretical approaches to attitude change" (p.255). This fact may help explain why the model lacks the clearer assumptions about memory and other basic cognitive processes necessary to describe and explain duality in information processing.

In the **person perception** field, M. B. Brewer (1988) and Neuberg and Fiske (1987; Fiske & Neuberg, 1990) have presented two contrasting dual processing models that have in common the assumption that an impression can be based either on the target's individual characteristics or on his/her category membership (a fit to a previous knowledge structure).

Brewer's (1988) model of person perception argues that exactly the same social information can be processed in either a top-down or bottom-up manner, resulting in the activation of a category representation (the process is reproductive) or in the formation of a person based representation (the process is productive). Whichever route is taken thus influences the way information is represented in memory. Category-based processing is associated with a non-verbal representation that has a high level of abstraction. This representation is taken to be holistic in nature (a prototype, for example). Category-based judgments are expected to be influenced by frequency and recency of category activation. Category-based processes depend on temporal and similarity relations to draw inferences and to make judgments and thus rely on basic pattern-matching cognitive mechanisms. In contrast, person-based processing induces a lower level representation (such as individual schemas and prepositional networks) independent of the category. The personalization route implies a more elaborated processing of the distinctive and unique features of the perceived individual.

As regards conjoint activation patterns, Brewer's model argues that first there is an initial identification stage (that is automatic and nonconscious) and that in a next stage the individual's motives and goals can determine whether he or she will engage in a more *personalized* or *category-based* processing of the stimulus person's characteristics. The two processes or routes by which information is integrated are *mutually exclusive* and seem to be activated by a conscious decision, based on the degree of self-involvement with the task. As these processes are assumed to be mutually exclusive[10] and non sequential, it is hard to envisage a way by which the output of one route could neutralize or be integrated with the output of the other route. However, this last possibility is apparently considered by the author, since she describes a further processing stage (i.e., individualization) that can occur subsequent to category-based processing. In this case, although the representation is categorical in nature, it maintains some personalized features.

---

[10] Analysis of Brewer's model (represented by a flowchart, Brewer, 1988 , p.5) suggests this exclusivity interpretation. However, on p.25 of the same chapter the author states : "although the outcomes of category-based and person-based processing modes are distinctly different, they are not mutually exclusive, and it is possible that information about a particular individual may be coded in both ways". If this is the case, the author should state not only under what conditions this might occur but also what is then the true relationship between the two postulated routes.

Fiske and her collaborators (Fiske, 1982, 1988; Fiske & Neuberg, 1990; Fiske & Pavelchak, 1986; Neuberg & Fiske, 1987) developed a model which assumes that the evaluation of a target can be carried out either in a *category-oriented way* (theory-driven) or in an *attribute-oriented way* (data-driven). Category-based judgments rely on the degree of similarity between the target and previously stored structures. Pure attribute-based operations are compositions of features - perceivers must average or add in some manner all of the target's particular characteristics (Fiske & Neuberg, 1990, p.8) in order to reach to an evaluative judgment. The model assumes that knowledge is organized in prepositional networks and that a single type of cognitive representation is associated with both category and attribute-based processing. Even assuming that one of these processes implies essentially a holistic (general) target analysis and the other more elementary (lower level) processing, no differences are assumed in the level of abstraction of the representation produced.

Fiske (1988) explicitly contends that her model differs from a branching model in that it assumes a continuum that "*allows most impressions to incorporate both the category and other attributes, but to different degrees at different points along the continuum*" (p.71). According to this view, the output of the category-based process can then be incorporated into the process that also considers each attribute. This model thus seems to suggest serial implementation of category-based followed by attribute-based processing. Note that if the categorization of the target is successful, the process stops and a category-based judgment is output. Only when all categorization attempts fail does the perceiver engage in piecemeal processing (which can include the previously activated category as a piece of information). Activation of the two processes is thus by definition mutually exclusive.

After a rapid initial categorization that occurs regardless of the perceiver's intent, the perceiver's degree of interest in the target together with the target's relevance determine whether the perceiver is motivated to pay more or less attention to additional attribute information. The amount of attention and effort focused on target features determines whether responses will be category-oriented or attribute-oriented. Category-based processes have priority over more distinctiveness-based processes, and only when target features mismatch typical category features does more attribute-based processing take place. Attention increases the probability of individuating processes only because it raises the probability of a mismatch occurring. Thus even a highly motivated perceiver is expected to first attempt to judge the target with regard to the initial categorization (confirmatory categorization) or even with some other category (re-categorization). Only after such categorization attempts fail does the perceiver attend more carefully to the target features. Thus the occurrence of piecemeal or attribute-based judgments implies that the target's perceived attributes were a poor fit to available memory structure (category, sub-category, exemplar, or self-concept).

In the cognitive literature several approaches have been developed to characterize general information processing. Working in the research field of **attention,** Logan (1988, 1989, 1991) developed *instance theory* as a general processing approach. This theory is one of the most relevant examples of the idea that processing is dualistic in all domains. Its basic assumption is that a desired outcome can be achieved either by an automatic or by a non-automatic, controlled process. Instance theory assumes memory retrieval as the single mechanism that underlies automatic processing. Non-automatic processing, in most cases, is subjugated to the controlled activation of general algorithms. This deliberate and voluntary activation and use of an algorithm may concur with or oppose automatic processing. The opposition, when it occurs, is mainly targeted at the output of the process, since there is little time for control over the very rapid automatic processing. Instance theory takes an episodic view of memory, since it assumes that "instance" or "exemplar" representations are formed of objects attended in the situation. Retrieval from memory is a necessary consequence of attention: any stored information associated with the stimulus is readily retrieved. The situation itself is assumed to be a general retrieval cue for memory, and if there are any traces available to support performance without an algorithm they will be immediately activated (the time activation takes is expected to be a function of the number of episodic representations). The repeated use of the same information in different situations will make it more and more available. People acquire domain-specific data bases that provide the appropriate information without much computation. The more familiar the situation, the stronger the response from memory.

Automatic processing can co-occur with more controlled processes. There is a race between the automatic process of retrieval and computation of an answer. If the answer can be quickly retrieved, it will be. If not, the answer will be computed. Responding on the basis of what is retrieved is a voluntary act. Thus the output of automatic processes can be inhibited or changed by more controlled processing whenever the processor feels it necessary to do so.

Other cognitive approaches to human information processing also stress the direct influence of **memory** on different kind of judgments and behaviors. Mandler's and Jacoby's represent two of the most relevant examples of approaches that assume a dual process perspective. Although both models generalize their assumptions to general information processing domains, Mandler's work is mainly focused on recognition processes.

George Mandler's *dual process theory of recognition* (Mandler, 1979, 1980, 1981, 1991, 1997) distinguishes processes that contribute to one and the same recognition judgment. Recognition is thus able to be achieved by a simple *activation-plus-integration process* or by a more *elaborative process*. Activation is assumed to be a primarily perceptual process that operates on already established mental representations (concrete schemas and "specific memories"). The simultaneous activation of a stimulus and such a general knowledge structure leads to the integration of stimulus features into the knowledge structure. As a result, this mental representation will become more and more compact, unitized, and accessible. This accessibility will be subjectively experienced as a feeling of familiarity, and this feeling underlies recognition judgments in the absence of a semantic/search process.

Elaboration is assumed to operate at a more conceptual/semantic level, establishing relationships between different mental representations and activating abstract and generic schemas. This elaboration process requires conscious participation and underlies the memory retrieval process involved in recognition tasks. In order to identify what an object or event is or where or when has been encountered, prior elaboration is necessary (Mandler, Hamson, & Dorfman, 1990).

The activation-plus-integration process and the elaborative process are two independent and parallel processes. Since the two processing modes operate simultaneously, they both influence recognition judgments. However, time influences which process outdoes the other. Fast recognition judgments elicited immediately after presentation are primarily a function of activation (being recognition judgments based on the feeling of familiarity with the stimulus). A delay between stimulus presentation and judgment will favor any item that was previously elaborated.

Larry Jacoby's *dual processing memory retrieval model* is integrated into a general dual processing model of judgment (Jacoby & Brooks, 1984; Jacoby & C. M.

Kelley, 1987, 1990; C. M. Kelley & Jacoby, 1996). According to this conceptualization, memory can be used as a tool or as an object to make either memory-based or other kinds of judgments (Jacoby & C. M. Kelley, 1987; Jacoby, C. M. Kelley, & Dywan, 1989). Memory as an object can be inspected, described to others, compared with other memories, and even integrated with other memories, to serve as a basis for different kinds of judgments. The use of memory as a tool assumes that prior episodes that match the current situation can unconsciously influence performance. Memory is an object whenever it is explicitly used, and memory is a tool whenever its influence on behavior is implicit. The distinction between two uses of memory (two processes) provides two different bases for a judgment: an *analytic* and a *non-analytic* base. Analytic processing segments and selects reality whereas non-analytic processes are holistic and global. Analytic bases for judgments are theories or collections of rules that are intentionally accessed to deal with the situation, allowing the information processor to specify the factors responsible for the judgmental outcome. Non-analytic bases for judgment reflect the automatic and unconscious influences of subjective experience. The presence of prior events in memory influences the fluency with which they are processed and thus influences the subjective experience that accompanies them. This subjective experience, a feeling of fluency or ease of retrieval, is related to a feeling of familiarity and underlies the use of memory as a tool in recognition judgments.

Analytic and non-analytic processes are assumed to be independent and to have independent influences on performance. The two processes are able to co-occur (so they can act in parallel) if there are no time or capacity constraints and in situations where individuals have an explicit judgmental goal (and thus can consciously and intentionally use the more analytic basis for judgment). In that case, the processes are expected to be immediately activated by the goal and the relevant stimuli, although analytic judgments are reached more slowly than non-analytic ones. If the co-occurrence of processes results in contradictory outputs, the non-analytic judgment will have little or no weight on the final outcome. In fact, awareness is assumed to serve the important function of opposing unconscious influences if necessary. Non-analytic judgments are, however, expected to be more pervasive in our daily lives either because we live in a state of mindlessness or because "we live in a divided attention condition more permanently" (C. M. Kelley & Jacoby, 1996, p.296). This non-analytic process tends to facilitate and optimize performance.

The episodic view underlying this approach strongly suggests that no abstract representations are associated with either analytic or non-analytic processing. The personal theories or algorithms that characterize the analytic process can be either elaborated at the moment or intentionally activated in memory. Their use is expected to leave an episodic, concrete trace in memory. Non-analytic processing involving the use of subjective experience (such as fluency of processing) as the basis for a judgment does not necessarily imply the activation of a memory trace. Thus although the use of memory as a tool can imply the activation of a particular episode in memory, fluency of processing can have causes other than memory activation. Nevertheless, as the result of repeated memory activation, a given response will become more and more accessible, be more and more fluently processed, and be experienced as more and more familiar.

In the **inference** and **reasoning** literature there seems to be a very old tradition of dual processing approaches. Sloman (1996) refers to Aristotle, William James, Piaget, and Neisser, among others, as examples of this tradition. These approaches talk about a dualistic mind characterized by two systems of reasoning: an associative system and an analytic system. Sloman (1996) distills the properties shared by many of these distinctions and summarizes them in a new functional and structural distinction which he terms an *associative system* and a *rule-based system*.

The first system operates on the basis of relations of similarity and contiguity. It is a holistic, automatic, re-productive process. The knowledge that is activated in this process is acquired by personal experience and is either represented as concrete or generic concepts or as more complex structures such as images, stereotypes, and feature sets. The rule-based system has a deliberative, controlled, nature. It is a system that takes advantage of compositional structures by manipulating symbols. Processors discover through analysis and abstraction the particular attributes of the object or fact that are essential to the problem at hand and apply previously acquired cultural rules to deal with the problem. Those rules are mentally represented as either concrete or generic concepts, defined by abstracted features or other compositional symbols, and are able to be generalized across settings. The system is productive in the sense that those "rules can be composed into each other to generate an ever larger set of propositions" (Sloman, 1996, p.5).

Sloman is clear about the pattern of conjoint activation of both systems. However in some of his arguments he suggests that activation of the two systems is independent[11]. When both co-occur (in parallel), the associative system's response, because of its speed and efficiency, often precedes the rule-based one. Its outcome might then, for a number of reasons, neutralize the activation of the rule-based process. In situations where this neutralization does not happen, both systems will provide a response. Their responses tend to be identical. However, whenever the

[11] "The point of this article is not that both systems are applied to every problem... or that each system has an exclusive problem domain. Rather, the forms have overlapping domains, domains that differ depending on the individual reasoner's knowledge, skill, and experience." (Sloman, 1996, p.6).

systems provide contradictory responses, the rule-based system is expected to suppress the associative response. Conscious suppression produces situations in which people seem to simultaneously feel that two contradictory responses are true (for example, the responses elicited by the sentence "Technically, a whale is a mammal", Lakoff, 1972, cited by Sloman, 1996). Sloman refers to this emergence of opposing responses as the crucial characteristic of a dual process/system perspective. The author argues that this characteristic is a "sufficient criterion" (criterion S) to accept the existence of two distinct reasoning systems.

In the **personality field,** Epstein (1973, 1990, 1994), developed a global theory of personality which he named the *cognitive-experiential self-theory*. This theory views the human mind as integrating two systems with distinctive modes of processing information. Those two modes of processing are referred to as two distinctive systems: a *rational system* and an *experiential system*. The rational system is characterized by analytic information processing ruled by logical principles. It is opposed by the experiential system which is holistic, more emotionally oriented, and ruled by associative principles. This quick and almost automatic process promotes the passive and preconscious experience of reality, whereas the rational system, in contrast, promotes a conscious, active, and controlled experience of the same reality. One reproduces the repeated memory of past experience and is very hard to change, whereas the other is mediated by conscious appraisal of events. Mental representations associated with each process differ in their level of abstraction, as reality is encoded either in concrete images, metaphors, and narratives, or in abstract symbols, words, and numbers. Both systems are assumed to operate in parallel. However, they are also assumed to interact with each other, contributing to one and the same output. The relative weight of their contributions is dependent on situational and individual factors such as similarity with past experience and the perceiver's style of thinking. "Emotional arousal and relevant experience are considered to shift the balance of influence in the direction of the experiential system" (Epstein, 1994, p.715). Nevertheless, human beings are expected to be able to do relatively more analytic and logical thinking when they are willing or motivated to do so (Kirkpatrick & Epstein, 1992).

After reviewing several dual process models developed in different topic areas within social cognition and cognitive psychology, E. R. Smith and DeCoster (in press) advanced a new conceptual model of the two processing modes: a *connectionist-inspired model of dual processing modes*. This model assumes the existence of two separate memory systems, each of which is associated with a processing mode. The associative processing mode is non-analytic and takes the form of pattern-completion or similarity-based retrieval in a connectionist schematic memory. This processing is preconscious since individuals are only aware of its results, which are experienced as intuitive affective responses to the stimulus. The general regularities that register in the associative memory system are learned very slowly, requiring a large amount of experience (high frequency). By incrementing the number and variety of instances encoded the connectionist structure extracts patterns that have been consistently observed over time, functioning as a schematic memory system. The process based on this system is thus essentially reproductive. The rule-based memory system learns very quickly if enough attention is mobilized to the situation. It learns symbolic rules that are socially and culturally transmitted through language. Rule-based processing, being based on logical principles, is essentially analytic and combines specific stimulus characteristics with activated conceptual knowledge.

The two processes are thought to be *simultaneously* activated and so to run in parallel. Because of its speed and efficiency, the associative system's response often precedes the rule-based one, and so rule-based processing can sometimes operate alone. However rule-based processing is optional and can be interrupted at any time. Information can be passed from the rule-based processing system to the associative one through repeated use of a rule. Experience can also be carefully analyzed and represented as a symbolic rule. Generally both systems will output a similar answer, although they can also produce conflicting answers.

Motivation and capacity factors influence which process governs output. Some motives (e.g., desire for accuracy) spur rule-based processing and some (e.g., quick response) associative processing. Since rule-based processing is effortful, capacity is necessary for its completion. Thus, lack of capacity will mean that associative output dominates. Several additional factors can also influence people's reliance on the two processing modes, such as focus on specific features versus global judgments, the request for more intuitive or more rational judgments, more specific or more global targets of judgments, and so forth.

Table 2.1 summarizes the dual process models just described, and makes it more evident that they resemble one another in some important ways and yet also have important points of divergence. The fact that some models are less exhaustive than others in their assumptions reflected by the lack of information necessary to complete each cell in the table. I also indicate whether or not classification of each model is explicitly supported by its authors.

Table 2.1: Summary of major dual process models' features

	PROCESS A	RELATION	PROCESS B
Chaiken et al. (1989)	**Heuristic processing** *Process*: use of simple inferential rules (schemas); use of few resources (attentional and awareness); top-down; theory-driven; reproductive. *Representation*: generic schemas. *Basic operations*:	*Processes* : redundancy (temporal primacy for heuristic). *Outcomes*: independent influence, with possible interdependence or additive posterior effects on judgment. *Regulation*: sufficiency principle. *Intervening variables*: capacity and motivation.	**Systematic processing** *Process*: analytic; semantic; controlled; intentional; elaborat bottom-up; data-driven; productive. *Representation*: *Basic operations*:
Brewer (1988)	**Category based processing** *Process*: comparison and differentiation; top-down; organizational, reproductive. *Representation*: non-verbal, abstract and holistic (prototypes) structures *Basic operations*: temporal contiguity and similarity.	*Processes* : mutually exclusive. *Outcomes*: "not necessary mutually exclusive." *Regulation*: conscious decision. *Intervening variables*: motives and goals.	**Personalized processing** *Process*:, abstraction and elaborati bottom-up; distinctive; product *Representation*: individual schemas prepositional networks. *Basic operations*: meaning extractic and composition of features.
Neuberg & Fiske (1987); Fiske & Neuberg (1990)	**Category based** *Process*: theory driven; holistic. *Representation*: prepositional networks. *Basic operations*: similarity.	*Processes*:: mutually exclusive and serial (temporal primacy for category-oriented process). *Outcomes*: "can incorporate both category and attributes." *Regulation*: match/ mismatch. *Intervening variables*: motivation (relevance), and capacity.	**Attribute based** *Process*: data-driven; concrete; elemental processing. *Representation* : prepositional netw *Basic operations*: meaning extractic and composition of features.
Logan (1988)	**Automatic** *Process*: unintentional; obligatory; quick; reproductive. *Representation*: episodic. *Basic operations*: "memory retrieval."	*Processes*: parallel; simultaneous (?) *Outcomes*: independent influence; algorithm can suppress bad automatic answer; automatic response can be intentional. *Regulation*: *Intervening variables*: capacity and familiarity.	**Algorithmic computation** *Process*: intentional; slow; product *Representation*: episodic. *Basic operations*: use of an algorith for computation of a new respon

Mandler (1980; 1981).	**Activation/integration** *Process*: quick; primarily perceptual; not necessarily conscious; bottom-up and top-down; reproductive and productive. *Representation*: concrete memory structures. *Basic operations*: memory "retrieval."	*Processes*: parallel; simultaneous (?). *Outcomes*: independent influence. *Regulation*: *Intervening variables*: capacity and familiarity.	**Elaborative** *Process*: conceptual; semantic; conscious; productive. *Representation*: concrete and generic abstract memory structures. *Basic operations*:
Jacoby & Brooks (1984); Jacoby & Kelley (1987; 1990)	**Non-Analytic** *Process*: automatic; unconscious; quick; based on fluency of processing; reproductive. *Representation*: episodic; concrete. *Basic operations*:	*Processes*: parallel; independent(?). *Outcomes*: independent influence; analytic suppresses non-analytic. *Regulation*: *Intervening variables*: relevance, capacity, and familiarity.	**Analytic** *Process*: intentional; conscious; either uses memory or new elaboration; reproductive or productive. *Representation*: episodic, theories, and collection of rules. *Basic operations:*
Sloman (1996)	**Associative system** *Process*: automatic; overall feature computation; unconscious; reproductive. *Representation*: concrete and generic concepts; images and features sets. *Basic operations:* similarity and contiguity.	*Processes*: independent(?). *Outcomes*: independent influence; analytic either corroborate or suppress non-analytic. *Regulation*: *Intervening variables*: motivation and capacity.	**Rule-based system** *Process*: strategic; analytic with abstraction of relevant features; conscious; productive . *Representation*: concrete and generic abstract concepts; compositional symbols. *Basic operations*: symbol manipulation.
Epstein (1973; 1990; 1994)	**Experiential system** *Process*: preconscious; holistic; emotional oriented; passive; reproductive. *Representation*: concrete images, metaphors, and narratives. *Basic operations:* associative principles	*Processes:* parallel; simultaneous; interdependence(?). *Outcomes*: interdependent. *Regulation*: *Intervening variables*: motivation and emotional level of arousal.	**Rational system** *Process*: analytic; conscious; controlled; productive. *Representation:* abstract symbols, words, and numbers. *Basic operations*: logical principles.
Smith & DeCoster (in press)	**Associative mode of processing** *Process*: automatic; fast; uncontrolled; preconscious; reproductive. *Representation*: specific exemplars or prototypes (in a connectionist structure). *Basic operations:* associative principles (similarity or contiguity).	*Processes*: parallel; simultaneous (?); can inform one another. *Outcomes*: independent influence; can be a posteriori differently weighted. *Regulation*: "natural selection." *Intervening variables*: motivation, capacity, and task characteristics.	**Rule-based mode of processing** *Process*: optional; slow; controllable; productive. *Representation:* abstractions. *Basic operations*: logical principles.

This review focused on some of the most representative dual-process models[12] with direct or indirect application to judgmental situations. As a whole the models corroborate the idea that there is a general theoretical need to perceive "the mind" as dualistic. In fact, the existence of such a plethora of dual-process models is no doubt strong evidence that the dual process perspective is both viable and consensual. Moreover, the models suggest that the processes distinguished in different psychological domains are almost identical in nature. This does not mean that the different theoretical proposals map perfectly on each other. They do not, and their differences must be carefully noted. However, the degree of similarity with which each process is defined certainly suggests that the various models may well be pointing up the same general distinction in processing.

Abstracting from the various models gives us a clear sense of what the two processing models are like. The mind can process information **non-analytically**, reacting very quickly to a situation by attending globally and superficially to the stimuli and activating the "usual" answer (an essentially reproductive output). This non-analytic processing is conceptually-driven and is characterized by a higher number of top-down

[12] Several other approaches in different psychological domains also refer to processing of the same stimuli as involving two distinctive processing modes. The feature comparison model presented by E. E. Smith, Shoben, and Rips (1974) stresses one process as more effortful and analytical than the other one which is redundantly activated. In the decision making and problem solving domains, behavior is generally assumed to have a dual-processing nature. Decision making was first postulated to be a rational process characterized by maximization. However, since the work of Herbert Simon (1957) it has been considered to follow essentially a "satisficing principle". Thus, although people can use an algorithm (a systematic procedure that is guaranteed to lead to a solution and that implies attending carefully and integrating all relevant features) to find a solution of a problem or reach a decision, they tend to use simpler strategies defined by the use of heuristics (Kahneman & Tversky, 1973; Newell and Simon, 1972). Fazio (1986) has proposed an attitude access model involving either an automatic or a more effortful route (see also Dovido & Fazio, 1992, distinction between spontaneous and deliberative processes). Garcia-Marques and Hamilton's (1996) TRAP (Twofold Retrieval by Associative Pathways) impression formation model includes two different retrieval processes, exhaustive and heuristic, hypothesized to underlie recall and frequency estimation of trait related behaviors.

than bottom-up activations. It operates automatically at a preconscious level (Bargh, 1996) and synthesizes personal experience as accumulated knowledge. Alternatively, the mind can engage in slower **analytic** processing by consciously analyzing the situation more carefully and paying attention to its unique features (both distinctively and organizationaly), thus generating a more idiosyncratic response (a productive output). Analytic processing is essentially data-driven, being characterized, however, by a interplay of bottom-up and top-down activations.

The Conceptual Status of Regulation in Dual-Process Models

The mood-as-regulation-mechanism hypothesis assumes that the mind's dual processes need a "regulation mechanism". The hypothesis thus focuses on the circumstances that gives one process an advantage over the other, that selects one or both modes of processing to be active at any given time. Thus, it posits an internal variable, or a set of internal variables, that are able to signal when it is necessary to activate either or both modes of processing.

However, not all questions about selection of modes of processing are questions about "regulation". Selection can occur more "naturally", as result of the relation between the nature of each mode of processing and the actual circumstances of the system (see E. R. Smith, 1994, for a proposed general theory of the selection of cognitive processes that fits this "natural selection" perspective). The specific characteristics of any situation may constitute powerful instigators of one or other mode of processing. At the same time the characteristics of each mode of processing (such as whether it requires considerable capacity) also determine the way individuals act in particular situations.

Two variables highlighted by different models as "intervening in processing" are of special importance in defining the relation between process and situation (see Table 2.1.). Capacity and motivational factors are able to favor one process over the other only because they restrict the nature of the process that can be activated. Analytic processing requires both willingness to process and resources to do so. The lack of capacity or lack of motivation (relevance, involvement), by default favors non-analytic processing (e.g. E. R. Smith, 1994).

"Natural selection" can be argued to be a more parsimonious explanation of process selection than the assumption of a "regulation mechanism". However, natural selection does not avoid the need to assume a variable that initiates processing. It only assumes that this trigger variable is not selective (having then to explain selection in a different way). In fact, the question of regulation seems to be directly related to assumptions about the conjoint pattern of activation of processes (simultaneous, independence, exclusivity, redundancy). If a "trigger mechanism" is expected to activate both modes of processing, it is not selective. Thus, an assumption of simultaneous activation does not require any regulation mechanism. Independence, however, means that one process may be activated before, after, or concurrently with the other, whenever the circumstances allow. In this case the trigger mechanism is selective and, thus, it is a "regulatory mechanism". Selection must also occur when models assume process activation to be mutually exclusive, as there must be a way to know which mode of processing will be active at any specific favorable moment. Redundancy, although defining process activation as dependent on the output of the other process, implies a mechanism that is sensitive to some relevant characteristic of that output. Thus a regulatory mechanism seems necessary in all but a simultaneously activated models.

Nor does natural selection answer all questions of process activation in situations in which one or both processes may occur. First, there is the possibility that information is processed non-analytically even when individuals have available resources to engage in deeper processing, and the outcome is relevant. Some examples of this possibility come from the literature on expertise. Expert may rely on their "intuitive responses" in face of relative important (relevant) decisions, even when they have all the resources necessary to process more analytically. Several studies have shown that compared with novices, experts tend to process information schematically (Arkes & Freedman, 1984; Chase & Simon, 1973; Reder & Anderson, 1980; Schmidt & Boshuizen, 1993). Equally motivated to offer accurate responses and with equal availability of capacity resources, they "choose" not to attend all information available very carefully. Expert use of non-analytic processing is not explained by simple references to capacity and motivational factors. In some way the system "knows" analytic processing is not necessary. Second, situations arise in which both modes of processing are not always available. Individuals may have learned how to deal with a situation analytically but not yet have developed a non-analytic response to it. The inverse is also possible: individuals may react non-analytically to a situation but not be able to deal analytically with it. If this is the case the system may well need some mechanism that signals whether a processing mode is available or is not accessible, even if this mechanism is associated only with the successful or unsuccessful triggering of a process.

Finally, an argument for the need for a regulation mechanism might be made because selection of either or both modes of processing tends to function quite automatically and reflexively (Bargh, 1990). No careful scrutiny of the features of the situation can be expected to occur. A mechanism that is sensitive to environmental characteristics and to individual internal states and that has the power to rapidly initiate or inhibit one or the other or both modes of processing is thus necessary.

Regulation assumptions in the dual process models reviewed

The dual process models described above suggest that in some circumstances one process has an advantage over the other. In so doing, they suggest ways in which processing modes are selected and define variables that impact process activation. This section addresses these suggestions by focusing on the issues summarized in the following questions: *What do models assume about the selection of one process mode over the other? What do models assume about why one process rather than the other is activated? Are there any assumptions in the models about a mechanism that regulates the type of processing? Or is the question of regulation replaced by a question of a specific interaction between nature of circumstances and nature of processes?*

The majority of the dual process models described here are not explicit about their process activation assumptions. Those models that assume simultaneous activation (E. R. Smith and DeCoster's, Logan's and Mandler's models) do not refer to process co-occurrence as necessary, but rather as a frequent possibility[13] to which they give special attention. By giving special attention to the fact that both processes "can co-occur" the models suggest that activation is not selected. Non-analytic processing, being

13 One possible reason why co-occurrence is not considered to be as necessary may be fact that modes of processing are not always available. Smith and DeCoster (in press) considered that when people lack relevant rules they may use whatever association they have available to perform adaptively and some associative pathways are only created through repeated use a rule information. A similar position is taken by Logan who also stresses the fact that an automatic response is not always available, and so in those cases must be computed.

automatic, cannot be avoided in the presence of a triggering situation. Intention to process and, thus, voluntary control have the trigger role in activating analytic processing. Any possible selection of processing seems to be a matter of "process characteristics" and "adaptation" to environmental demands and occurs only subsequently activation of both processes (or at least the attempt to activate them). Selection, thus, does not require a regulation mechanism.

However, since the models lack precision regarding activation characteristics, it is also possible that the simultaneous activation that "can" occur, is not always intended to occur. For example, E. R. Smith and DeCoster note that both modes of process are not always available. If this is the case, the assumption of simultaneous activation may mask this independence of the processes, and a regulation mechanism becomes necessary. Similar arguments can be made about Jacoby's and Sloman's models. Although they suggest processs activation to be independent, the authors also tend to specially emphasize the circumstances in which both processes co-occur. By doing so, the authors open the door to the question of regulation, although they never address it.

Only three of the dual process models described above consider at least in some way the question of process activation and regulation. With the assumption that process activation is mutually exclusive, Brewer's (1988) model of person perception assumes that the individual's motives and goals will determine which processing path (personalization or categorization) will be pursued. Note that these motives in and of themselves make one process more available than the other (as would be expected by a "natural selection" perspective). Regulation is presented as a voluntary, intentional decision to engage in one or the other of the processes and thus is totally dependent on the individual's will.

While also assuming mutual exclusivity, Fiske's model explicitly refers to a mechanism of regulation (Fiske, 1982, 1988; Neuberg & Fiske, 1987; Fiske & Neuberg, 1990; Fiske & Pavelchak, 1986). Activation selection depends on the stimulus, or more properly on the *degree of matching* between the stimulus features and a specific knowledge structure (a category). Category-based processes always have priority over more distinctive processes, but a bad match will initiate an individuating process. Individuals give an advantage to this more analytic processing by carefully attending to stimulus features, and thus increasing the probability of a mismatch.

The third model that focuses on the question of regulation is the Heuristic-Systematic Model (Chaiken, et al., 1996). The regulation mechanism posited by this model follows from a sufficiency principle. It assumes heuristic processing as the default mode of processing, as long as it provides a sufficient *degree of confidence* (a sufficiency threshold). Failure to reach this desirable threshold will trigger more systematic processing. Thus a feeling of confidence associated with non-analytic processing in a specific situation signals whether the individual needs to engage in deeper processing or not. Instead of assuming that individual differences and situational factors restrict processing as a matter of "natural selection", this model assumes that these factors impact on the regulation mechanism.

In sum, it is not clear if the dual process models reviewed see process selection as resulting from "natural selection" or from a "regulation mechanism" activity. The majority of the models are not clear about their assumptions regarding the conjoint activation patterns of their processes. Thus, it is not clear if they agree or disagree about a set of circumstances that may or may not trigger analytic processing.

Given the importance of the regulation assumption for the mood-as-regulation-mechanism hypothesis and given that the majority of dual process models do not elaborate on the selection problem, I will now analyze some models that focus more directly on these issues.

Models with explicit regulatory mechanism

Some information processing models have focused directly the question of process selection and on the conditions that determine the activation of particular ways of processing current information. By reviewing examples of such "regulation" models in the cognitive and social cognitive literature, we can see if they provide any consensus regarding the nature of a such regulatory mechanism.

The **synapse model** (Higgins, 1989, 1996; Higgins & Brendel, 1995) is a general model of knowledge accessibility and activation that describes determinants of the relation between stored and stimulus information. It assumes that stimulus information has two functions: a stimulant function or a target function. The basic assumptions of the "synapse" model are that stored information (memory representation) varies in its levels of excitation prior to stimulus exposure, and that all else being equal, the higher the level of excitation of a memory at input, the greater the likelihood that the construct will be activated and so guide behavior. Prior excitation level is directly dependent on the frequency and recency of activation. It is the combination of a construct's prior level of excitation and its applicability to the input that determines the likelihood that a previously stored item of information will dominate the current process. The excitation level of a stored memory by itself is not sufficient to reach the threshold of activation required for subsequent use. A *good match* between the features of the input and of the memory is also necessary (Higgins, Rholes, & Jones, 1977). In what sense is this a regulatory model? The model has three characteristics that are directly related to an assumption of a "regulation mechanism". First, it assumes that stimulus processing can be controlled either by a previously-stored memory representation or by the stimuli itself (and so it assumes some kind of duality in stimulus processing). Second, the model defines the constraining variables that determine how each stimulus is going to be processed. Third, those variables are not expected to restrict process activation by merely creating an unfavorable environment for one mode of processing. Interestingly, the model gives all the regulatory power (i.e., the management of the way the stimulus is going to be processed) to the stimulus itself, because of the role played by its previous and actual presentation.

A similar assumption is made by another "regulatory approach": **mismatch theory** (Johnston & Hawley, 1994). The basic assumption of this theory is that if subjects recognize their familiar settings, know the situations in which they find themselves frequently, and yet engage in detailed physical analyses of them every time, this would be a waste of time and energy. The theory presupposes that if the mind is a resource managing system, it would not make sense to deal with an already known stimulus exactly as it was dealt with the first time. It would be a waste of limited capacity that could be invested in other specifics of the situation, especially the new ones. A more efficient alternative would be to largely suppress the physical analysis of familiar scenes and rely on knowledge. The theory thus conceptualizes the mind as an efficient system that engages in conceptually-driven processing whenever possible. It is not the case that data-driven processing of familiar situations never occurs, only that it usually does not. Transitory goals may induce individuals to engage in data-driven processing. In that case individuals may carefully attend to more specific aspects of even our familiar environments. But how does the system "know" that more or less superficial processing is necessary to cope with the situation? Mismatch theory, in line with other models (Hintzman, 1988; Humphreys, Bain, & Pike, 1989), postulates that an initial bottom-up processing of some aspects of a situation triggers the appropriate type of processing. If the situation is somehow familiar, subjects can rely on their previous knowledge. If this knowledge is highly and extensively activated (which induces a great amount of top-down processing), it will "turn down" bottom-up processing. One important aspect of this theory is that the *turning-down* of the bottom-up processing does not mean it will be permanently *turned off* in conceptually-driven situations. Bottom-up mechanisms are supposed to be periodically activated allowing verification and, when necessary, updating of expectancies.

In mismatch theory, as in synapse theory, we also find the idea that regulation comes from the stimuli itself, more specifically from the *match* between the actual stimulus presentation and previous presentation, operationalized as a "feeling of familiarity". Familiarity is thus the variable that is expected to induce conceptually-driven processing of information.

In the field of problem solving the question of processing regulation has also been addressed (see, for example, Schunn, Reder, Nhouyvanisvong, Richards, & Stroffolino, 1997) as an issue regarding the relative role of retrieval and reasoning. Reder and Ritter (1992) found that before responding to each problem, individuals made a quick "**feeling of knowing judgment**" about whether they could retrieve the answer or whether they had to compute it. Whenever a question is posed there is an automatic activation of this feeling. Its purpose is to help regulate strategy selection (Nhouyvanisvong & Reder, 1998). The feeling of knowing was shown to be independent of actually knowing the answer to the problem but related instead to the degree of familiarity of the situation (Reder, 1987; Reder & Ritter, 1992; Schunn et al., 1997). These results suggest that an unique variable such as the "feeling of knowing" (that is, the degree of belief that the relevant information can be retrieved) acts as a critical signal for the cognitive system to switch between processing modes. This variable is determined by the degree of familiarity with the situation/problem (i.e., its current activation level, see Reder, 1987). The process associated with how this mechanism functions is described by a generic semantic network model called SAC - Source of Activation Confusion (see, Nhouyvanisvong & Reder, 1998). The model is defined by interassociated nodes of concepts that vary in long term and current activation. Each concept associated with the problem is represented in memory as a node which has a base level strength. This strength represents the prior history of exposure to that concept. In addition to that level of activation, each node also has a current level. The current level is changed whenever the concept receives stimulation from the environment or from another concept related with it. The strength of a link that connects two nodes depends on how often the two concepts have been stimulated together. The activation level of the whole problem node determines the feeling of knowing. In sum, the critical strategy selection mechanism postulated by Reder and his collaborators is based on a feeling of knowing which arises from the level of familiarity with the situation (question). Very familiar problems will promote strong feelings of knowing and thus the favored response will imply a less effortful top-down retrieval strategy. Weak feelings of knowing (caused by unfamiliar contexts), on the other hand, will favor a more effortful bottom-up computational strategy of problem solving.

The three models described are examples of information processing approaches that stress the need for a regulation mechanism. Importantly, these models seem to agree on such a regulation mechanism's general features. The synapse model considers memory representation excitation level to depend directly on the frequency and recency of activation and on the its degree of applicability - *matching* to a memory trace. Similarly, Reder and his collaborator refer to level of activation as dependent on a previous history of activation and degree of *matching* to current question features. The *degree of familiarity* with the situation determines the activation level of the question and thus the feeling of knowing its answer. Again similarly, the degree of *matching* between the perceived features of a stimulus and a memory trace regulates how information is going to be processed, in mismatch theory. This is because matching is directly translated into a *feeling of familiarity*, which determines the relative priority of top-down, less elaborative processing versus bottom-up, more elaborative processing of the current situation. Thus, together these three models suggest that the degree to which the characteristics of the current situation match some memory representation is associated with activation level of that representation. This activation level seems to be translated into a feeling of familiarity which has a causal role in selecting how information is processed.

How consistent are these ideas with those expressed in the dual process models discussed earlier? Because Brewer considers regulation to be an issue of intention, neither matching nor familiarity play any role on it. At first glance, the idea that feelings can regulate processing also seems at odds with the Heuristic-Systematic Model. From the Heuristic-Systematic-Model perspective, regulation depends on a subjective feeling of confidence about the heuristic processing output. The degree of confidence associated with this output determines whether systematic processing needs be activated or not. How this confidence is assessed and how the feeling arises are, unfortunately, matters not fully explored by Chaiken and her collaborators. Note, however, that some evidence suggests a close relation between confidence about output and familiarity (Jacoby & C. M. Kelley, 1987). Thus, the Heuristic-Systematic view of regulation may be more compatible with regulatory models that it first seems. The importance of degree of matching in determining how information is processed is quite consistent with Fiske's dual process model. In Fiske's model, matching between stimulus and its memory representation selects how information is processed. However, Fiske does not assume, as do regulation models, that such matching will produce feelings of greater familiarity or that it is this implicit feeling that regulates the system processing mode.

In sum, the regulatory models focus on *matching* of presented stimulus features to memory traces and the feeling associated with that matches as the mechanism that regulates process selection. The fact that a stimulus match a memory makes processing more fluent. Thus a re-encountered stimulus is processed more easily than it was during its first encounter. This fluency or ease of processing, experienced subjectively as a *feeling of familiarity*, can then have various effects (see Jacoby & C. M. Kelley, 1990; E. R. Smith, 1994; Schwarz & Clore, 1996). What is suggested by these regulatory approaches and stressed by the mood-as-regulation-mechanism hypothesis is that one such effect is the selection of processing mode activation.

Matching features and their role in regulation

Because the regulatory mechanism is defined by the degree of match between stimulus and memory information, it is important to clarify the concept of matching and the role its characteristics play in regulation.

Objectively matching is a process of finding a one to one correspondence between the information that reach our sensory organs and the information represented in memory. This correspondence is assumed to be experienced and subjectively perceived as a feeling.

Processing does not integrate all information related with stimuli and its context. Only certain elements from the world are selected for cognitive processing, with other information being filtered out (see Broadbent, 1958; Bruner, 1957). The information in the environment to which an individual currently directs his/hers attentional resources is call *focal*. Since not all features of stimuli are expected to receive equal attention at any point (Higgins, 1996; E. R. Smith & Zárate, 1992) the features of our environment that define the focal stimulus (a characteristic determined by several different factors, included expectancies) are variable. This implies that the similarity between stimulus and a memory representation is also variable. "Similarity depends on the way perceiver processes and interprets the stimuli" (Smith & Zárate, 1992, p.9). Thus, a first important feature of matching is that, matching is relative to what is focal. Any variable that impacts on individuals' attention will then impact on degree of matching.

The importance of this feature of matching is that the focal stimulus definitions may mediate the effect that several variables have in mode of processing. These variables may influence focal stimulus definition by influencing either the amount or the direction of attention to some or other details of the situation. Given that, as the focal stimulus becomes more and more detailed the probability of a match with any memory representation decreases, any task that *focuses attention* on the specific features of the stimulus has a higher probability of recruiting analytic processing (Kahneman & Miller, 1986; Sherman et al., in press; E. R. Smith & DeCoster, in press). Inversely, any *distraction* or capacity restraint will reduce the details of the focal stimulus, increasing the probability of a match and consequently the probability of recruiting non-analytic processing. *Processing goals* may induce individuals to engage in different modes of information processing by priming them to attend to different (more or less familiar) aspects of their environment. "Perceivers' goal influences attention and [consequently] perceived similarity" (E. R. Smith & Zárate, 1992, p.12). Features relevant for one processing goal are not necessary relevant for another processing goal. Thus, focal stimulus definition is dependent on the processing goal activated. The *intensity of motivation* to fulfill those goals might further influence the definition of focal stimulus by influencing the number of those relevant details that are attended to. Highly motivated individuals will favor more analytic processing by intentionally focusing their attention on all the goal relevant (and perhaps some non relevant) features of the stimulus. Changes in the focal stimuli brought about by attention to more detailed features of the stimulus will increase the probability of a mismatch (as suggested by Fiske, 1987). Because they allocate few attentional resources to the stimulus, individuals with little motivation are unlikely to notice deviant components of the stimulus. Thus changes in motivation can reflect changes in either or both the amount and the direction of capacity allocation. These changes will influence the definition of the focal stimulus and, thus how familiar the situation is perceived to be.

A second important feature of matching arises from its nature. Matching is a "global" process (see Hintzman, 1990, for a review), and to be implicitly experienced as a feeling of familiarity. In this way, familiarity signals not only the match of the stimulus with all items in memory (or at least with all items learned in a particular context) but also the degree of match between stored information and the focal stimulus (focal "object" plus focal "object-context") *as a whole*. The more elements in memory that match the focal stimuli and the more closely they match it, the stronger the internal signal of familiarity will be (Hintzman, 1988). Different degrees of matching will be associated with different intensities of a feeling of familiarity (which seems to vary in a continuous fashion, Yonelinas, 1994).

The relevance of this feature is associated with the fact that because of the continuous nature of the feeling not all variations in the intensity are expected to lead to variations in processing mode. Only when the feeling of familiarity falls below some threshold are individuals expected to engage in analytic processing. This threshold is defined by the amount of familiarity felt as necessary and sufficient, at a precise moment. The argument is similar to the one presented in the Heuristic/Systematic Model (e.g., Chaiken, et al., 1989). Activation of more analytic processing depends on a criterion of confidence: the *sufficiency threshold*. This threshold is assumed to vary as a function of situational and personal variables. The idea that some threshold is associated with the impact of familiarity in mode of processing activation is also stressed by Yonelinas (1994). In his studies, "Familiarity was found to be a signal detection process, whereby only items exceeding some criterion were judged as old" (p.1351). The use of non-analytic processing was found to increase gradually as this criterion become more lax (p.1352).

The third and final important feature of matching is that it is a *never ending* process. As information is continuously received by our sensory organs it is matched to information stored in memory. An initial matching will however inhibit bottom-up processing. As a consequence, some additional "familiar details" and even some "unfamiliar details" of the stimulus may be disregarded (see Johnston & Hawley, 1994, for a review of this effect). However, inhibition of bottom-up processing will happen primarily for "expected" or "irrelevant" inputs, since "unexpected" inputs are expected to enhance bottom-up processing. As stated by mismatch theory, familiar stimuli or scenes are associated with suppression of bottom-up processing of expected components and with *popout* of deviant components (Johnston & Hawley, 1994). As a consequence, attention is greater for unexpected or incongruent features than for expected or congruent ones (see Stangor & McMillan, 1992; Rojahn & Pettigrew, 1992, for reviews). However, only if these unfamiliar details of information significantly reduce the degree of matching are they expected to trigger more analytic processing. Importantly, the likelihood of a deviant component's popout is related to variables such as: the degree of deviance (how much the component mismatches memory representation; Barton & Sanford, 1993), its relevance for the processing goal (the likelihood of defining the focal stimulus, Locksley, Stangor, Hepburn, Grosovsky,& Hochstrasser, 1984), and the general degree of stimulus familiarity (see Johnston & Hawley, 1994, for a review).

In sum, the regulation of how information is processed is on the hands of a feeling that reflects the degree with which input match some stored representation. This matching is relative to what is focal, and thus dependent of attentional factors. Being a global sign varies in an continuum and thus implies some threshold to be associated with the impact of familiarity in mode of processing activation. Matching is a continuous process and thus at any moment of the general process unexpected information may trigger more analytic processing.

Necessary characteristics of a regulatory mechanism

What are the necessary characteristics of a variable assumed to function as a regulation mechanism? The "regulatory models" reviewed above give the role of regulation to a situationally sensitive internal variable (degree of matching, feeling of familiarity). A variable, in order to have the property of triggering a processing mode, and thus of regulating processing, has to be an *internal variable,* has to be a variable that belongs to the information processing system. However in order to define an adaptative system, the variable, must at the same time be able to relate the system to its environment. It must, thus, be an internal variable which is sensitive to the relevant environmental characteristics. In addition, this variable must not be able to be turned off. It has to be able to constantly signal how information is going to be processed. Since information processing cannot be turned off, its regulatory mechanism cannot be turned off either. Further, to have a regulatory role, a variable has to have a systematic relation to how information is processed. Different levels of that variable have to be related to different activation patterns of the two modes of processing. In sum, a variable which acts as a regulatory mechanism must be a) an internal variable, that b) cannot be turned off, that c) is sensitive to relevant environmental variations and that d) has a systematic relation to the mode with which information is processed.

Conclusion

The emergence of different dual process models in both the cognitive and the social cognition fields, together with the empirical evidence associated with them, provide strong support for a dual processing conception of the function of the mind. These frameworks contend that our decisions and judgments are developed either through an analytic process or a non-analytic process. Analytic processing implies a careful consideration of the specific characteristics of a situation and their integration with some information in memory in computing a judgment. Non-analytic processing, in contrast is mainly a reproductive, conceptually-driven, top-down process. Thus, there is ample evidence of the existence of dual processes in human cognition, as assumed by the mood-as-regulation-mechanism hypothesis.

Although process selection can be considered a "naturally occurring event", there are also reasons to suggest that such a dual process system needs a regulation mechanism. Although time and capacity can favor non-analytic processing, there is still need for some (possibly voluntary) mechanism that dictates whether the judgments produced by such processing are adequate. Even without constraints, regulation must also be assumed, since even under such conditions non-analytic processing can occur. A review of models that explicitly include regulation, suggest that an adequate regulation mechanism for such a system need to be constantly presented, context-sensitive, and internal to processing system.

The three dual process models that have been most explicit about their regulatory assumptions confer this function on a "feeling" related to the fluency with which stimuli are processed. Thus there is evidence that human information processing requires a regulation mechanism, as centrally assumed by the mood-as-regulation-mechanism hypothesis. The fact that this function is bestowed upon a feeling state that triggers process selection is also consistent with the mood-as-regulation-mechanism hypothesis.

CHAPTER III:

Analyzing the "Heart"

Is mood a viable regulation mechanism?

The MIPE (**M**ood **I**nformation **P**rocessing **E**ffect) clearly suggests that our cognitive system is sensitive to affective changes. The functioning of the "mind" is, without doubt, affected by the "heart". The mood-as-regulation-mechanism hypothesis claims that the impact affect has in processing is not a question of moderation but instead a question of mediation. Affect is a variable that is intrinsic to the processing system and not a variable that may impact processing. The hypothesis assumes the existence of two distinctive modes of processing information and of a mechanism whose function is to regulate the two processes' activation pattern. Based on assumptions of some "regulatory models" (see Chapter II) the mood-as-regulation-mechanism hypothesis considers that this regulation mechanism has the characteristics of a feeling. It thus accounts for the effect we defined as the MIPE, by suggesting a close relation between mood and this feeling

This chapter aims to understand if the feeling we call mood is a viable regulation mechanism or not. First, it deals with issues of mood definition and analyzes whether mood is compatible with the characteristics that may be considered necessary for a "regulation variable". Second, it analyzes, in more detail, the characteristics of the MIPE by reviewing the relevant empirical evidence.

Mood: Definitional issues

The first necessary step in trying to argue that mood may have the characteristics necessary to a regulation mechanism is to define what mood is. Unfortunately, this is not an easy task. There is no consensus in the literature on how to define not just mood but related concepts like emotion, feelings, and affect. In fact, the perplexing differences in the usage of the affective lexicon make the goal of clearly understanding how to define these terms, almost impossible. However, given this general state of disagreement and inconsistency in the literature, there are some points which may be considered at least as more consensual. I will focus on those in defining how various terms will be used in this dissertation.

Generally, affect is opposed to cognition. Affect represents a supposedly non-cognitive dimension of human life, where stimulus processing is translated into valenced feelings instead of being translated into knowledge. This dimension of human life allows us to experience a situation as good or bad, positive or negative, disturbing or comforting, and so forth. The use of the term affect refers to a general category of "feelings" such as mood and emotion (Batson, Shaw, & Oleson, 1992; Forgas, 1995b;

Sedikides, 1995; Simon, 1982). The affective phenomena of mood and emotion have in turn been distinguished[1] on the basis of the following criteria: duration, intensity, diffuseness or globality, and attribution to an unidentifiable or unknown cause (M. S. Clark & Isen, 1982; Fridja 1993; Jacobsen, 1957; W. N. Morris, 1989; Rucmick, 1936; Schwarz, 1990). In contrast to emotions moods are *more pervasive*, *lower in intensity* and *more diffuse* and *global* than emotions (e.g., M. S. Clark & Isen, 1982; Forgas, 1992a; Fridja, 1993; Schwarz & Clore, 1988; Sedikides, 1992). Moreover, although moods usually do not have a traceable antecedent (e.g., M. S. Clark & Isen, 1982; Forgas, 1992a; Fridja, 1993; J. V. Wood, Saltzberg, & Goldamna, 1990), they *change in valence with reference to the relation between the internal and external world.*

Mood is pervasive. Mood is expected to be a constantly activated feeling, that is, to be pervasive. This property of being constantly activated should not be confounded (as has been done) with other properties such as "of longer duration" (e.g., Nowlis & Nowlis, 1956; Schwarz & Clore, 1988; Sedikides, 1992) or "being less variable" (Isen, 1984)[2]. Moods, like emotions, can have different durations, from seconds to years (being thus more or less variable). Emotions, like moods, can change either slowly or quickly. We can love someone for minutes and we can love someone for the rest of our lives. We can be scared by a spider for seconds or we can be afraid of it for the rest of our lives. We can feel bad for one single moment or be depressed for years. We can feel happy for one

[1] This distinction is far from being universal. There are of course those who do not distinguish between moods and emotions (e.g., Solomon, 1980; Zajonc, 1980).

[2] Mood has also been defined both as a trait (and so as very stable) and as a state with a duration of weeks or months (see Carlson & Hatfield, 1992, for a review). These views have made it necessary to refer to *transient mood states* in comparison (see, for example, Carlston & Smith, 1996).

second and change in the next. What is important about the pervasive property of mood is that it is *omnipresent* (we are always in some mood). This omnipresence is supported by mood's *continuous* nature (W. N. Morris, 1992). Mood changes from a positive pole to a negative pole. Between these two poles are different intensities of negative and positive feeling. When a very mild negative feeling begins to change to a very mild positive feeling, we feel neither one way or the other (we experience it as a "neutral mood" state[3]). However, this non-positive, non-negative state is also a feeling, and not its absence. Emotions, on the other hand, may be absent. They are not necessarily always present. Not to be in love, or not to be afraid, is not something that is felt. It is more an absence of feeling.

Mood is a low intensity feeling. A second distinctive property of mood is its low level of intensity[4]. There is a general consensus with regard to the fact that what we usually refer to as a mood state is a mildly positive or a mildly negative mood. To be mildly sad or mildly happy is our regular way of feeling. Emotions, on the other hand, are generally more intense feelings. Yet, although mood is referred to as having low intensity, there are known cases of severe depression and euphoria, which are also referred as "mood states". This extreme positivity (*mania*) and this extreme negativity (*depression*) are,

---

[3] In a metric sense the neutral mood state is an unique point on the continuum that, like any other point, represents a particular intensity state (zero). The likelihood of such a point (the likelihood of any particular point of a continuum) is near zero. However, not all points of the continuum are distinguishable at the subjective experience level. Because of that fact, valenced feelings with very low intensity are usually experienced as neutral mood state.

[4] Although it is possible that intensity has some relation to arousal, there seems to be no reason to assume that intensity is the same thing as arousal (see, for example, Revelle & Loftus, 1992, for a similar argument).

however, non-normal or pathological cases of mood. They differ from mild mood states in that they are usually very hard to change and so are seen as much more stable than mild moods. The fact that mood can assume these non-natural values should not, however, affect the way mood is characterized. Let us think for instance of body temperature values. There is a range of temperature values that can be considered normal. There is another range that is considered pathological. How do we define body temperature? It is certainly not by its abnormal properties. How temperature usually changes and how these changes affect our body are questions that focus on its normal values. The understanding of how the body reacts to very high and very low temperatures can help clarify some questions regarding the temperature mechanism. However, these studies cannot assume that the mechanism will function in exactly the same way at normal and abnormal values. Thus depression and euphoria can be considered pathologic, non-normal mood intensities. The study of how these highly intensive affective states can influence cognition can inform us about both cognition and affective system properties. It can even indicate the way these two dimensions are related to each other. However, those studies will always be far from being representative of the normal function of affect. Thus the implications of these pathological states for cognitive processes should not be generalized to mood states as they vary normally in intensity. As Fridja and his collaborators (Fridja, Ortony, Sonnemans, & Clore, 1992, p.61) pointed out, “Not paying attention to intensity variables may well confuse empirical findings”.

Mood is diffuse and unfocused. This property of diffuseness seems to be related to mood’s absence of orientation towards an external object. We do not feel in a bad mood towards someone in the same way that we hate someone. We simply feel bad “inside”.

Emotion, in contrast to mood, implies a reference to what the feeling is about. Mood, in contrast to emotion, does not have a target (Averill, 1980; M. S. Clark & Isen, 1982). Contributing to this quality is the fact that the antecedents of mood are not always easily traceable to an external object or event. When an external event is identified as the cause of our feelings and the feeling is thus able to be referenced to an external object, we are experiencing an emotion. However, not all causes (even external ones) are easily identified. To the extent that the cause of a valenced feeling cannot be identified, the feeling will became more and more diffuse, being attributed to unstable fleeting objects or to no object at all. Such a feeling is, thus, likely to be reported as "mood".

Mood changes in valence with reference to the relation between the internal and external environments. Whereas emotions are understood to have a cause directly associated with the external object towards which they are directed, the causes of mood are more frequently assumed to be internal. However, those authors that refer to mood as having an "internal cause" (e.g., Batson et al., 1992; W. N. Morris, 1992) define it as a relation between internal and external environments. For Morris, mood exists to signal states of the self in terms of the physical, psychological, and social resources available to meet perceived environmental demands. For Batson et al. (1992), mood informs the organism about the likelihood with which pleasure or pain will be obtained from interaction with the physical and social environment. Just as different body sensations may signal different body temperatures, the feeling that we call mood signals differences in positivity or negativity, goodness or badness. But just as body temperature can be affected by the relation between the internal and the external environment, so too can mood.

What is known about how mood changes? What stimuli or events are known to trigger different mood states? The basic fact seems to be that how people report they feel varies with changes in either internal or external environments. Although in general people seem to be in a mildly positive mood (Diener, 1984), fairly innocuous events, such as changes in the weather, are known to lead to changes in their moods (Cunningham, 1979; Schwarz & Clore, 1983). Thus, mood is a very transient state: although we might be in a good mood for a while, this positivity is expected to dissipate quite quickly[5] into a neutral state or even to degenerate into a negative feeling (e.g., Erber, 1996). Different *external* events such as music (e.g., Sutherland, Newman, & Rachman, 1982; Wenzlaff, Wegner, & Klein, 1991), films or documentaries (e.g., Isen & Gorgoglione, 1983), newspaper stories (Erber, 1991; Kuykendall & Keating, 1990; Wegener & Petty, 1994; Wegener, Petty & Smith, 1995; Williams, 1980), positive or negative feedback (M. S. Clark & Waddell, 1983), rewards and punishments, and so forth, are all known to trigger quick changes in current feelings.

There is also evidence of variations in reported mood as the result of some *internal* variations. Changes in the characteristics of the processes we engage in influences our feelings. Interruption of a boring task arouses greater positive feeling than information that it will continue increases distress (Wisem & Levin, 1995). In addition, several studies have shown that thoughts have a direct impact on feelings. Direct evidence of this impact can be found in one the most frequently used techniques of mood manipulation, the Velten procedure (1968). This procedure invites individuals to read a

[5] Clark (1983) and Isen, Means, Patrick, and Nowicki, (1982, p.245) report that several mood induction methods have common effects that persist for 5 to 15 minutes.

series of emotionally charged statements and instructs them to generate a mood congruent with those sentences. The same impact is found with the autobiographical recollection of positive and negative events (Bless, Bohner, Schwarz, & Strack, 1990; D. Brewer, Doughtie, & Lubin, 1980; Goodwin & Williams, 1982) and with the self-generation of positive and negative stimuli (Baugmann, Cialdini, & Kenrick, 1981; Manaucia, Bauman, & Cialdini, 1984; Salovey & Rodin, 1985; Wegener et al., 1995). There is also evidence that mood changes with factors other than with emotionally charged content. Mood changes with changes in our facial expressions (Adelman & Zajong, 1989; Blaney, 1986; Ellis & Ashbrook, 1988; Laird, 1984; Laird, Wegner, Halal, & Szegda, 1982; Strack, Martin, & Stepper, 1988) and with changes of temporal rhythms such as circadian (Sack & Weher, 1988), weekly (Larsen & Kasimatis, 1990), and seasonal rhythms (Wehr & Rosenthal, 1989).

All this evidence suggests that how people report feeling is subject to several distinctive influences. The most direct known influence is exerted by stimuli or events with emotionally charged content. This means that external and easily traceable stimuli impact on individuals' moods. This implies that emotions impact moods. Two points must be considered with regard this possibility. First, the only thing that evidence shows is that emotionally charged events can induce individuals to report being in a better or worse mood. Whether the feelings that induce those ratings are always the same is unknown. Feelings do not always have clear boundaries and so other feelings can also influence reports about how individuals currently feel. Second, if the feelings evoked by an emotionally charged external object or emotional memories are not clearly associated with their causes, they may really be experienced as mood. Mood induction is however also possible without the presentation of emotionally charged stimuli.

But what about the idea that mood changes in valence with reference to a relation between the internal and external environments[6]? The factors just reviewed as known to affect mood ratings do not seem to be directly related to changes in the physical, psychological, or social resources available to meet perceived environmental demands (as assumed by W. N. Morris, 1992). No direct evidence has associated mood ratings with the relation between appraisal of resources and demands. However, there are several experiments that have looked at the impact of discrepancy between existing conditions and desired goals on how individuals feel (see Carver, Lawrence, & Scheier, 1996, for a review). Discrepancy reduction, particularly fast reduction, seems to be related to greater positive affect. This discrepancy reduction implies a change in the relation between the internal and external environments. Thus, changes in the valence of mood can occur with reference to the relation between our internal and external environments.

In summary, mood may be differentiated from other affective states by characterizing it as an *unstable continuous, low intensity, and diffuse affective state that is able to change in valence with reference to a relation between the internal and external environments.* External objects can also have an impact on individuals' moods via other feelings, such as emotions. Mood is omnipresent and changes in mood are made within a small range (low intensity values) on a continuum anchored by positive and negative valence. Positive changes do not necessarily imply a change from one pole to

[6] This reference to the relation between the internal and external environments could be defined as a *collative variable*. This concept was first introduced by Berlyne (1965) to specify a stimulus-individual interaction. Stimulus properties such as novelty and familiarity represent both some aspect of the stimulus and some aspect of the individual's experience (Zajonc, 1998).

the other, but only movement towards the positive pole, with negative changes implying movement in opposite direction. Unlike an emotional state, a mood state does not usually attract the individual's attention. Given its pervasiveness, low intensity, and diffuse nature, mood can, and usually does, function in the background of other cognitive activities (Bless & Fiedler, 1995).

Compatibility of the definitional features of mood with those of a regulation mechanism

The mood-as-regulation-mechanism hypothesis claims that mood is able to regulate processing activation. The definitional features of mood presented above seem to fit some of the characteristics previously pointed out (in Chapter II) as necessary for any variable to act as a regulatory mechanism. The definition of mood, just offered, fits with the first two necessary characteristics: mood is an internal variable which cannot be turned off. The third necessary characteristic is that the variable must be sensitive to relevant environmental variations. An argument in favor of this sensitivity may be the fact that mood is defined as a transient state. If mood did not change easily, that would necessarily mean that it could not be sensitive to the needs of a cognitive system which must be constantly adapting to its environments. This criterion, however, points to the fact that that sensitivity must be contingent on the *relevant* environmental variations (which, according to regulation models discussed in Chapter II, should be the degree with which encountering stimuli match previously stored information). The little information we have about how and in what circumstances mood changes does not allow clear support for the claim that mood plays this role. In fact, to better understand the function of mood and its influence on judgment, it is necessary to focus even more closely on the mechanisms by which mood changes. Mood changes as result of changes in individuals' general environments, but why? What are the common features of all the stimuli that change mood in one direction or the other? Is there any common pattern in these changes or are they mediated by other variables? Answers to all these questions, which are unfortunately not currently forthcoming, will help clarify the claim that mood can be a mechanism that regulates how information is processed.

The fourth characteristic that a variable needs to function as a regulation mechanism is a systematic relation to the mode with which information is processed. This relation is the focus of this dissertation, as embodied in the MIPE. In the next section, I analyze this effect more thoroughly.

Are particular mood states associated with particular modes of processing information?

The mood-as-regulation-mechanism hypothesis aims to explain the fact that mood influences information processing. This influence has been claimed to be related to engagement in a more or a less analytic processing mode. Thus the mood information processing effect (MIPE) stresses that different moods states are associated with different modes of processing information. This section aims to clarify the features of this effect at the same time as making clear the claim that mood is related with mode of processing.

More precisely, positive mood is associated with a different mode of processing than is non-positive mood.

The relation between mood and cognition has been studied within different domains of information processing: memory, attribution, evaluation, persuasion, impression formation, and so forth. However, only some of the studies in these domains were developed within a dual-process framework and with a methodology that allows us to dissociate one process from the other. Only those studies which allow output from an analytic process to be distinguished from output from a non-analytic process provide support for the claim that mood can function as a process regulation mechanism. Furthermore, only a sub-set of those studies shares the view of mood as a *transient valenced* feeling and so does not confound a pathological state with a normal functional one[7]. Three criteria were used to categorized a study as studying a transient mood state: (1) mood was induced; (2) the mood induction procedure was not related to any specific emotion, such as love, fear, anxiety etc., and (3) checks on the effectiveness of the induction centered on current feelings (asking "how do you feel right now, at this moment", for example). A review of the results produced by this subset of studies will clarify how such transient valenced feelings may be related to modes of processing information[8] and thus will help to better clarify the MIPE.

---

[7] For an extensive review of the effects on cognitive processing of being versus not being depressed, see Hartlage, Alloy, Vasquez, & Dykman (1993).

[8] For this reason I will exclude from this review all studies focusing on the direct impact of mood on the valence of output. That is, studies of mood congruency effects are excluded. For a review of these effects, see, for example, Sedikides (1992).

Mood and reaction to strong or weak persuasive arguments: Persuasion studies

The studies that most directly relate mood to a particular processing mode are those developed within the persuasion field. These studies were developed within a theoretical framework of dual-processing models such as the Systematic-Heuristic approach (Chaiken, 1980, 1982, 1987) and the Elaboration Likelihood Model (Petty & Cacciopo, 1981, 1986). Typically, in these studies mood is an independent variable crossed with a manipulation of the persuasive argument's quality: weak and strong arguments. Weak arguments are expected to elicit unfavorable evaluations in those who attend them very carefully and more favorable evaluations in those who do not elaborate on their content. On the other hand, strong arguments do not engender completely opposite types of responses from individuals engaging in different modes of processing information. The main point is, then, that individuals who engage in analytic processing react differently to weak and strong arguments, where as those who engage in non-analytic processing react more similarly to weak and strong arguments. Argument quality in this experimental paradigm has thus the important role of enabling the researcher to infer from individuals' attitudinal judgments the mode of processing in which they were engaged. Thus, for example, if in a low-involvement condition individuals presented with weak arguments reacted similarly to those presented with strong arguments, it could be concluded that in such conditions individuals tend to engage in a non-analytic processing mode (e.g. Petty & Cacioppo, 1979, 1990)[9]. In addition, if highly motivated individuals reacted differently to strong and weak arguments it could be inferred that they were processing the content of the message analytically. In this way, the typical persuasion experimental paradigm is a setting that allows researchers to assess the mode of processing with which individuals compute new **attitudinal judgments**. Because of this, it is no surprise that the majority of the studies investigating mood effects on cognitive processing have been developed within this paradigm (for reviews, see for example, Fiedler, 1988, 1991; Mackie, Asuncion, & Rosselli, 1992; Schwarz, 1990; Schwarz & Clore, 1996; Schwarz & Bless, 1991).

In addition to attitudinal judgments, other related dependent measures can also be informative of the mode with which the information was processed. One such measure is the **number and quality of the thoughts** that are elicited by the persuasive arguments. These cognitive responses can be assessed by asking individuals to list all the thoughts that popped into their minds as they were listing to the persuasive message (Greenwald, 1968; Brock, 1967). Relevant to the question of process diagnosticity is the coding of these listed thoughts as favorable or unfavorable to the attitudinal issue. Weak messages are by definition expected to elicit unfavorable thoughts in those engaged in analytic

[9] Bless and Schwarz (in press) call our attention to a logical fallacy (*affirming the consequent*) associated with the inference of a processing mode on the basis of the differential impact of different quality arguments. They emphasize the importance of distinguishing sufficient and necessary conditions for analytic and non-analytic processing. I agree that this inference is conjectural in nature, but so in fact is all scientific knowledge. We always accept *transiently* a hypothesis that is inductively inferred from verified results that were predicted by it (which is deductively invalid reasoning). In this context the key word is *transiently*. That is, we should always be ready to abandon this kind of conjectural inference, if empirical evidence (rather than pure logic) suggests that is invalid.

processing. Strong messages elicit more favorable thoughts. Thus, differences in the general quality of thoughts produced by individuals in response to strong and weak arguments allows us to argue that they were engaged in analytic processing. Moreover, the number of those responses can increase as individuals elaborate content more and decrease as they elaborate content less. In this way, the impact of positive mood on the number and the favorability of cognitive responses is a clue to the extent to which information was elaborated and so to how information was processed.

The impact of a heuristic on a judgment is also expected to be different depending on the mode in which information was processed. Heuristics are simple rules which are assumed to provide individuals with a simpler and quicker way to achieve a judgment (Chaiken & Eagly, 1983). If individuals do not carefully analyze the content of persuasive messages their judgments are expected to be more influenced by the activation of heuristics than if individuals engage in such analytic processing (Chaiken, Liberman, & Eagly, 1989). Individuals who engage in analytic processing of the message are expected to rely less on simple rules and more on message content. In this way, the impact of heuristics on attitudinal judgments is also informative of the process that governed formation of the judgments. Thus, further support for the idea that a particular mood is associated with less analytic processing could be provided by studies manipulating the presence or absence of a heuristic cue.

Other relevant clues about the mode of processing being used can be gleaned from **processing times**. Judgments that result from more systematic or analytical processing are expected to take more time than superficial and non-analytical judgments.

Table 3.1 summarizes the studies of the impact of mood on processing that were developed within the persuasion experimental paradigm. The table provides information on mood induction and mood check procedures, experimental design, and experimental procedures. Results are focused on the impact of mood on variables that are diagnostic of processing mode, such as attitude judgments and cognitive responses.

Table 3.1: Summary of mood studies developed in the persuasion field

	Mood induction and check procedures (HM-Happy mood; NM- Neutral mood; SM- Sad mood; CM-Control)	**Design and procedure** (Ss - Subjects) (S- Strong arguments; W- Weak arguments)	**Relevant results** (significant: marginal+; p<.05*, p<.01**; p<.005***)
Worth & Mackie **(1987)**	**Induction**: Lottery participation with $1 reward (HM) or no lottery participation (NM). **Check:** Effectiveness tested with separate group. Question "How do you feel at the present moment", two 9-point scales (Happy-Sad; Pleasant-Unpleasant) HM= 6.06; NM= 4.07 .	**2 (mood) x 2 (message con and pro) x 2 (expert vs non-expert) x 2 (strong vs weak arguments).** **Procedure:** Disguised measure of attitude previous to mood manipulation. After mood manipulation, Ss read on a PC screen a message about acid rain control presented by environmental major or mathematical major, with the goal of evaluating the source's performance. Ss then rated their attitudes (9-point scale) with RT assessed and listed their thoughts	*Mood main effect *:* HM recalled fewer arguments than NM. *Mood x Arg. Quality interaction* : NM attitude change * and quality of cognitive responses * , differently affected by S and W arguments; HM not. *Planned comparisons related with Mood x Expert interaction* $^{+}$ *:* HM but not SM attitudes differently affected by expert and non expert.
Mackie & Worth **(1989)** **Exp. 1**	**Induction**: Lottery participation with $2 reward (HM) or no lottery participation (NM). **Check:** (...)	**2 (mood) x 2 (limit exposure vs no limit time) x 2(strong vs weak message).** **Procedure:** Disguised attitude measurement previous to mood manipulation. After mood manipulation . Ss read on PC screen, with a goal of evaluating source performance, a counter attitudinal message regarding acid rain . Ss then rated their attitudes (9-point scale) with RT assessed, listed their thoughts and recalled arguments	*Main effect of Mood *:* HM had longer exposure times than NM. *Mood x Exposure interaction **:* HM recalled fewer arguments than NM. *Planned Contrast associated to the Mood x Exposure x Arg Quality interaction *:* Regarding attitude change, only HM in limited exposure time not differently affected by S and W arguments. *(No mood impact on quality of cognitive responses)*

Mackie & Worth (1989) Exp. 2	**Induction**: Affective stimuli presentation (4m) - humorous film (HM); depressing film (SM); informational film (NM). **Check:** After viewing the film. Embedded in the film survey, Ss were asked to rate (on two 9-point scales-Happy-Sad and Pleasant-Unpleasant) how they feel at the present moment: HM=6.70; NM= 5.74.	**2 (mood) x 2 (expert vs non expert) x 2 (limited exposure vs unlimited exposure) x 2 (strong vs weak message).** **Procedure:** Disguised attitude measurement previous to mood manipulation. After mood manipulation and check, Ss *read* on computer screen, with the goal of evaluating source performance, a counter attitudinal message presented by a legal scholar or by a freshman regarding the handgun control issue. Ss then rated their attitudes(9-point scale) with RT assessed, listed their thoughts and recalled arguments	*Main effect of Mood* *: HM had longer exposures times than NM. *Planned Contrast associated with the Mood x Exposure* ** : For HM in limited exposure recall was lower than other 3 conditions *Planned Contrast associated with the Mood x Exposure x Arg Quality interaction*: With regard attitude change * and quality of cognitive responses . All Ss differently affected by S and W arguments except HM with limited exposure. *Planned Contrast associated with the Mood x Exposure x Expertise interaction* +: Only HM attitudes in limited exposure time were differently affected by expertise level.
Bless, Bohner, Schwarz, & Strack (1990) Exp. 1	**Induction**: Vivid and detailed written report of a happy (HM) or sad (SM) life event. **Check:** Before experimental task. Embedded in a participant questionnaire: "How do you feel at this very moment"- 9-point scale (very good to very bad). HM= 7.0; SM= 6.1	**2(mood) x 2 (strong vs weak message) x 2(content vs language focus of attention)** **(base line given by a control group)** **Procedure:** After completing participant questionnaire, Ss listened to a counter-attitudinal message regarding increasing student fees, with either a goal of evaluating it or comprehension of language. Ss then rated their attitudes (9-point scale) listed their thoughts and answered a free-recall and recognition test about arguments.	*Mood x Arg Quality interaction*: SM attitude ** and proportion of favorable responses ***, but not HM, differently affected by S and W arguments. *Planned Comparisons with control group* * : Attitudes of HM focused on language differed from the control group independently of message quality. In all other conditions only those with S arguments differ from it. (*No mood effect on amount of cognitive responses and free recall*)
Bless, Bohner, Schwarz, & Strack (1990) Exp. 2	**Induction**: Vivid and detailed written report of a happy (HM) or sad (SM) life event **Check**: Before experimental task Embedded in a participant questionnaire: "How do you feel at this very moment"- 9-point scale (very bad to very good). HM=6.3; SM= 5.4	**2(mood) x 2 (strong vs weak message) x 2(distraction vs no-distraction).** **Procedure:** After completing participant questionnaire, Ss listened to a counter-attitudinal message regarding increasing student fees, with a language comprehension goal, either simultaneously solving 11 simple arithmetic problems or not. Ss then rated their attitudes(9-point scale) and list their thoughts	*Mood x Arg Quality interaction* + : SM but not HM, quality of cognitive responses differently affected by S and W arguments *Mood x Arg. Quality interaction x Distraction*: SM attitudes+ differently affected by S and W only in non-distraction condition *. In contrast HM do not differentiate arguments in either distraction condition.
Kuykendall & Keating (1990)	**Induction**: Affective stimuli presentation - Stories: "Meeting half a way" (HM); "Revitalization of Chicago " (NM) ; " Babies with AIDS" (SM). **Check:** After reading the story. Embedded in article evaluation survey. Ss rated their current feelings in a 9-point scale (1-negative, depressed; 9-positve, uplifted). HM=7.30; NM= 4.85; SM= 3.10).	**3(mood) x 2 (strong vs weak arguments)** **Procedure:** After mood induction and check, Ss were asked to evaluate the writing style of an editorial about the exams of their own school (counter-attitudinal message). After reading the editorial Ss indicate their attitude on three 0-100 scales (unfavorable/ favorable; apathetic/enthusiastic; harmful/beneficial). Thought listing then assessed.	*Mood x Arg. Quality interaction* : SM attitudes * were differently affected by S and W arguments. HM did not differentiate arguments. Only NM quality of cognitive responses ** differentially affected by S and W arguments.

Batra & Stayman **(1990)**	**Induction**: Affective stimuli presentation - happy and warm story (HM) vs no story (NM). **Check:** After reading the story. Embedded in an "empathy survey". Reduced version of Mood Adjective Check ILst (Nowlis, 1965) with 4 point scales. Three scales emerged from Factorial Analysis: happy; warm; negative. HM= 3,07; 3,04; 1,41; NM= 2,69; 2,60; 1,64 .	**2(mood) x 2 (strong vs weak arguments) x 2 (high vs low need for cognition).** **Procedure:** After the "empathy study" in where NFC was assessed (18-item scale of Cacioppo, Petty & Kao, 1984), Ss were presented with a printed ad (with 3 strong vs weak arguments) for a bank and asked *to* read it and to evaluate the bank services. Then Ss listed their thoughts and answered brand-attitude questions.	*Mood main effect:* HM report more favorable brand-attitudes** and fewer unfavorable responses** than NM. *Mood x Arg. Quality interaction *:* NM attitude differently affected by S and W arguments, whereas HM do not differentiate arguments . *(No interaction on quality of cognitive responses)* *(No three way interaction)*
Smith & Shaffer **(1991)** **Exp.1**	**Induction**: Affective stimuli presentation (12 m) - humorous video (HM); informational film (NM). **Check:** After viewing the film. Embedded in the film survey, Ss were asked to rate (on four 9-point scales-bad-good; sad-happy; unpleasant-pleasant; depressed-elated) how they feel at the present moment: HM=28.54; NM= 23.56.	**2(mood) x 2 (strong vs weak arguments) x 2 (high vs low relevance).** **Procedure:** After film survey, Ss listened to a counter-attitudinal message (7 strong or weak arguments-1m) in favor of comprehensive exams which would be implemented either in the following year (high rel.) or 5 years hence (low rel.). Then Ss rated how much they agree with the conclusion and with the general idea (two 9-point scales, 1- not al all; 9- very much), listed their thoughts and recalled arguments.	*Mood Main effect*:* NM generated a higher number of message related thoughts than HM. *Mood x Relevance interaction:* In low relevance condition NM generated a higher number of message related thoughts * and more unfavorable thoughts * than HM. *(No mood effects on: argument quality evaluations and attitude)*
Smith & Shaffer **(1991)** **Exp. 2**	**Induction**: As in Exp. 1. **Check:** As in Exp. 1: HM=29.80; NM= 25.00.	**2(mood) x 2 (strong vs weak arguments) x 2 (expert vs non-expert) x 2 (heuristic before vs after message).** **Procedure:** After film survey, Ss listened to a counter-attitudinal message (8 strong or weak arguments) about acid rain control, with the goal of answering to some questions. Ss were informed that the message was delivered by either an expert or a non-expert on the topic. This information was given before message or after message. Dependent variables were collected as in Exp. 1.	*Mood Main effects:* NM attitudes* agreed more with message than HM. HM generated more favorable thoughts* than NM. *(No mood effects on: argument quality evaluations and number of message related thoughts)*
Smith & Shaffer **(1991)** **Exp. 3**	**Induction**: Vivid and detailed written report of a happy life event (HM) or imagine their usual route to school (NM) **Check**: As in Exp. 1. HM=28.17; NM= 22.58.	**2(mood) x 2 (mood stability: fixed vs control) x 2 (strong vs weak arguments)** **Procedure:** Before mood induction, Ss received a believed to be a memory drug. Half of them were informed that a drug side effect was to "preserve mood" (fixed mood condition). After mood induction and check, all Ss listened to the acid rain message with a memory goal setting. Dependent measures were collected as in Exp.1.	*(No mood effects on: attitude measures, argument quality evaluations, number of message related thoughts and favorability of those thoughts)*

Innes & Ahrens (1991) Exp. 2	**Induction**: Velten procedure with 12 self-reference taped recorded positive (HM) or neutral (NM) statement. **Check**: Before and after mood manipulation. With the Depressive Adjective Check List (Ellis et al., 1984). Positive changes for MH and no changes for NM were obtained	**2 (mood) x 2 (critical vs creative goal) x 2 (strong vs weak arguments)** **Procedure:** After mood manipulation and check, Ss read a pro-attitudinal message regarding a relevant issue (media ownership in Australia) either with the goal of participate in a critical debate about the issue or of participate in a creative debate about the issue. Ss then rated their attitudes(11-point scale) list their thoughts and recall arguments	*Mood x Goal x Arg Quality* [+]: With critical goal NM but not HM attitudes were differently affected by S and W arguments. The creative goal did not show the same pattern. *(No information regarding other dependent measures)*
Bless, Mackie, & Schwarz (1992) Exp. 1	**Induction**: Vivid and detailed written report (15m) of a happy (HM) or sad (SM) life event **Check**: Immediately after mood manipulation. Embedded in a task questionnaire: "How do you feel right now" - 11-point scale (very bad to very good). Mood before message: HM= 7.8; SM= 5.8 Mood after message: HM=8.7; SM=6.3. Mood after filler task: 7.1/ 7.1 (mood dissipates)	**2(mood) x 2 (strong vs weak arguments) x 2 (mood on encoding vs on judgment)** **Procedure:** Ss listen to a counter-attitudinal message about increasing of student fees, with a language comprehension goal, either before (judgment) or after (encoding) mood inducement (filler and mood task were counterbalanced). Ss then rated their attitudes(9-point scale) list their thoughts and recall arguments	*Mood x Arg. Quality .x Timing of mood induction interaction* : Ss' attitudes * and quality of cognitive responses [+] were differently affected by quality of arguments in all conditions except when Ss were in HM while encoding the message. *(No effect of mood on recall)*
Bless, Mackie, & Schwarz (1992) Exp. 2	**Induction**: Affective stimuli presentation (5m) - humorous film (HM); depressing film (SM); informational film (NM). **Check:** After viewing the film. Embedded in a film survey. "How do you feel now" - 9-point scale (sad-happy): HM= 7.21; SM= 4.05; NM= 6.02.	**3 (mood at the time of judgment) x 2(strong vs weak arguments) x2 (global evaluation vs detail representation)** **Procedure:** Ss read a counter attitudinal message about the oil drilling issue, with a language comprehension goal, before mood inducement. Then they answer a question about either the general strength of the message or how many arguments were in the message. Mood inducement precede attitude judgments. Ss then rated their attitudes(9-point scale) being RT assessed, list their thoughts and recall arguments	*Planned Contrast associated with the 3-way interaction* * : Ss attitudes differently affected by quality of arguments in all conditions except for HM Ss when first asked for the number of the arguments presented. *(No effects of quality of cognitive responses are reported)*
Bohner, Crow, Erb, & Schwarz (1992) Exp. 1	**Induction**: Affective stimulus presentation: individuals find either a coin (HM) or an onion (NM) **Check**: Disguised interview at the end of study "How do you feel right now, at this moment" on a 10 point scale. HM= 7.5; NM= 6.0	**2(mood) x 2 (strong vs weak arguments)** **Procedure:** In a natural setting. Ss were asked to comply either with a favorable strong argument or without any argument.	*Planned Contrast associated with the Mood x Arg Quality interaction* ** : NM but not HM behavioral compliance , was differently affected by the presence or absence of a strong argument.

Bohner et al. **(1992)** **Exp. 2**	**Induction**: Bogus feedback: positive or negative feedback regarding performance on an alleged "Vocational aptitudes test" **Check**: After manipulation. Embedded in a post experimental questionnaire : How do you feel now at this moment on a 9-point scale (bad-good). HM= 6.53; SM= 4.77	**2 (mood) x 2 (strong vs weak cue) x 2 (strong vs weak arguments)** **Procedure:** In a natural setting. Ss were asked to give money either to a strong cause (for wheelchairs ramps) or weak cause (for separate library for the disabled), at the same time they saw a list of contributors either with 2 (weak consensus) or 19 names (strong consensus)	*Mood x Consensus x Arg Quality interaction* *: Ss in all conditions <u>complied</u> with the request, except when in SM with W arguments and weak consensus.
Bohner & Apostolidou **(1994)**	**Induction**: Vivid and detailed written report of a happy (HM) or sad (SM) life event **Check**: Before message exposure, and before attitude judgments were made, subjects indicated their current mood. (...)	**2(mood) x 2 (strong vs weak arguments) x 2 (mood at encoding vs at judgment) + 2 control condition: neutral mood x (strong vs weak)** **Procedure:** Ss in the <u>encoding</u> conditions after mood induction read a message advocating the fluoridation of drinking water (8 <u>strong</u> or 8 <u>weak arguments</u>). Then they performed a filler task (to read and reproduce an affectively neutral paragraph), and reported their attitudes toward fluoridation on a 6-item 9-point scale. In the <u>judgment</u> conditions, the order of mood induction and neutral task was reversed. <u>Control</u> Ss performed a neutral task both before and after reading the message.	*3-way interaction* + : Ss <u>attitudes</u> differently affected by quality of arguments in all conditions except when Ss were in HM while encoding the message. *Planned comparison between S and W arguments in Happy vs Neutral mood, at Encoding* + : When mood was manipulated at encoding, NM <u>attitudes</u> were more differently affected by S and W arguments than HM attitudes.
Bodenhausen, Sheppard, & Kramer **(1994)** **Exp. 2**	**Induction**: Vivid and detailed written report (12 m) of an angry (A) or sad (SM) life event, or mundane events of the previous day (NM). **Check:** (...)	**3 (affect) x 2 (expert vs no expert source)** **Procedure:** After mood induction, Ss *read* an essay about raising the legal driving age attributed either to a group of transportation policy experts at Princeton University or to a Princeton student. Ss then rated their attitudes (11-point scale) and listed their thoughts	*Affect x Expertise interaction* * : Angry Ss <u>attitudes</u> but not SM nor NM differently affected by high and low source credibility. *(No effect of argument quality)*
Bodenhausen, et al. **(1994)** **Exp. 3**	**Induction:** Same as in Exp. 2 **Check:** (...)	**3 (affect) x 2 (high credible source vs low credible source)** **Procedure:** After mood induction, Ss *read* an essay about banning meat from meals either attributed to a students government or vegetarian league. Ss then rated their attitudes (11-point scale) and listed their thoughts	*Affect x Expertise interaction* + : Angry <u>attitudes</u> but not SM nor NM differently affected by high and low source credibility. *(No effect of argument quality)*

Bohner, Chaiken , &, Hunyadi **(1994)**	**Induction**: Vivid/ detailed written report of a happy (HM) or sad (SM) life event. **Check** : Before exp. situation. Embedded in a post-participant questionnaire. "How do you feel at this very moment"- 11-point scale (1-bad ; 11- bad). HM= 8.21; SM= 4.75.	**2 (mood) x 2(strong vs weak arguments) x 2 (ambiguous vs unambiguous mess.)** **Procedure :** Ss read a test-report, done by an expert, comparing two competing brands of a product (answering machine). The target was described as superior in 4 important features (Unambig) or 4 unimportant features (Ambig.). Ss rated favorability towards product, if it was good or bad and intention to buy it (three 11-point scales) and listed their thoughts	*Planned Comparisons associated with the Mood x Arg. Quality x Ambiguity interaction :* Although all Ss attitudes were differently affected by S and W arguments (*main effect of argument quality****), HM attitudes* were only different from SM attitudes when they received a unambiguous weak arguments. *(No effect of cognitive responses)*
Sinclair, Mark, & Clore **(1994)**	**Induction:** Ss were approached on either pleasant (HM) or unpleasant (SM) days. **Check**: Embedded in questionnaire for statistical control of data. After attributional manipulation. Evaluation of their present mood on a 9-point scale (9= happiest). HM= 6.75; SM= 6.13.	**2 (mood) x 2(strong vs weak arguments) x 2 (attribution vs no-attribution)** **Procedure :** Half of the Ss were told that weather could affect mood and asked to rate the weather (attribution). After Ss rated their present mood, they listened to 3 weak or strong counter-attitudinal arguments advocating the implementation of a comprehensive exam with the goal of evaluating the source performance. Ss then rated their attitudes (four items associated with 9-point scale)	*Mood x Attribution x Arg Quality*:* In no-attribution condition SM attitudes were much more affected by quality of arguments than HM whereas in attribution condition SM and HM did not differ.
Wegener, Petty, & Smith **(1995)** **Exp. 1**	**Induction**: Imagine and write 2 positive (skip finals, expenses-paid trip to Hawaii- HM) or 2 neutral (go to library and check a book- NM) scenarios **Check:** (...)	**2(mood) x 2 (strong vs weak arguments)** **Procedure :**After mood induction, Ss *listen*ed to a message regarding "changes in the foster care program", with two goals: judge sound quality and judge the quality of speakers' voice.	*Mood x Arg. Quality:* HM but not NM attitudes * and favorability of cognitive responses + were differently affected by S and W arguments
Wegener, Petty, & Smith **(1995)** **Exp. 2**	**Induction**: Affective stimuli presentation (10m) - humorous film plus article (HM); depressing film plus article (SM) . Ss were correctly informed about how the article was supposed to make them feel. **Check**: After film - how it make you feel- and after article - average of three 9-point scales (not reported) . HM= 1.88 and 2.46 ; SM= 7.54 and 7.80.	**2 (mood) x 2 (uplifting/proatt. Vs depressing/counteratt)) x(strong vs weak arguments)** **Procedure :** After mood induction, Ss *read* a pro-attitudinal or counter attitudinal message regarding increasing student fees. Messages were said to make people feel happy (if pro-att) or sad (if counter-att). Ss asked to evaluate the quality of the message.	*Mood x message content x Arg Quality:* Attitude*** and favorability of cognitive responses** of HM Ss that received a counter-attitudinal message, did not differentiate between S and W messages contrary to all other conditions.

Rosselli, Skelly, & Mackie **(1995)**	**Induction**: Affective stimuli presentation (5 m) - "Comic relief" program in video (HM); informational film about wine (NM). **Check:** After viewing the film. Embedded in the film survey, Ss were asked to rate (on three 9-point-scales-sad-happy) how the film made them feel; how they were feeling at the present time; how they describe their mood at the present time: HM= 6.51; NM= 4.94.	**2 (mood) x 2 (emotional vs rational message type) x(strong vs weak message) x 2 (pro vs con issue)** **Procedure :** After mood induction, all Ss *read* a counter-attitudinal message with 6 arguments regarding animal research that were strong or weak and emotional or rational in nature. Each argument was presented one at a time, in random order. Ss controlled rate of presentation. Then Ss reported attitudes and listed their thoughts	*Mood x Arg. Quality interaction* : NM but not HM attitude changes * and quality of cognitive responses *, differently affected by S and W arguments. *Path Analysis:* HM post-attitudes were mainly determined by their initial attitude. SM post-attitudes depended on type of arguments and were mediated more by cognitive than affective responses.

The results of almost all these experiments converge on the suggestion that individuals in positive moods are more likely to engage in a non-analytic, more superficial mode of processing information than those in non-positive moods. In general both attitude change and cognitive response measures generated by individuals in good moods seem to be unrelated to quality of arguments. For the attitudinal measures, this pattern was verified in sixteen of the nineteen directly relevant studies. The differential impact of quality of arguments on the quality of happy and non-happy individuals' cognitive responses is verified in eight of the fifteen studies that include this measure. In those eight studies happy individuals generated an equal number of favorable responses (or have an equal index of response favorability) in the face of strong or weak message quality. The results of other studies never oppose this pattern; it simply did not emerge, or emerged without statistical significance.

As can be seen in Table 3.1, the finding that happy individuals' attitude change is unrelated to the quality of arguments has been replicated with: (1) a variety of mood manipulations (bogus positive and negative feedback on different tasks, presentation of several different humorous or depressing video-clips, the Velten procedure, vivid imagination of positive or negative scenarios, monetary rewards, naturally occurring weather); (2) a variety of attitudinal issues (government control of acid rain production; increase of university students fees; media ownership in Australia; oil drilling of the California coast; raising the age at which young people can drive; banning meat from a regular diet; the quality of an answering machine; implementation of comprehensive exams; animal research) and even behavior compliance with different requests (permission to make a phone call or making a monetary contribution); (3) a variety of modes of presenting the relevant information (read on paper, read on computer screen, listened to from a tape recorder, listened to from a person); (4) a variety of populations (German students, American students, Australian students, all from different universities); and (5) a variety of settings (experimental settings in laboratories, natural settings in laboratories, natural settings outside the laboratory).

The results of the studies reviewed point to the fact that individuals in neutral moods elaborate incoming information more. Neutral mood is thus associated with analytic processing. Mildly negative feelings are also argued to be associated with this mode of processing. It is worthwhile, however, to call attention to the fact that only two of the reported studies compare three levels of mood directly, (Bless, Mackie, et al., 1992; Kuykendall & Keating, 1990). All the other studies compare a positive with a non-positive state, whether it is a "neutral" or a "negative" mood state.

Together all these studies help to clarify further characteristics of the MIPE. They suggest that the MIPE: might be a small effect, might not occur only at encoding, might depend on the specifics of processing goals (focus on target/issue/object/arguments), might depend on vagueness about mood's source, and is influenced by motivational and capacity manipulations. Evidence also seems to suggest that in the persuasion domain, the effect may occur with the processing of both pro-attitudinal and counter-attitudinal issues.

Is the MIPE a small effect? In the studies reviewed in Table 3.1, the magnitude of the MIPE seems to be very weak. Although there is a consistent pattern in the data of the reviewed studies, it is frequently only marginally statistically significant (see Table 3.1). Even more powerful statistical analyses, such as planned contrasts, are frequently associated with alphas higher than the usually accepted 5%. This suggests that the MIPE may be quite a small effect. That is, although positive mood tends to be associated with a particular mode of processing, this is not always the case. The effect may be reduced because situational or personal variables often interfere with the relation between mood and processing mode. The persuasion studies reviewed show that variables such as message type, processing goals, and processing time, for example, all affect the magnitude of this relation. However, it might also be argued that instead of detecting what is a small effect, these studies allow only limited detection of a big effect. That is, it may be that the association between mood and processing mode is strong, but current methods of assessing mood and measuring processing mode lack precision [10]. Notice that in these persuasion studies the MIPE is identified not by individual variability but by between subjects variability (processing mode is inferred from an interaction of between subjects factors). If future research demonstrates that the MIPE is in fact a quite small, theoretical explanations will need to incorporate some justification for this fact.

---

[10] In either case, researchers should attend more carefully to "measures of dispersion" (such as S.d. and S.e.) associated with both mood measurements and processing mode estimates. It would be interesting to analyze whether conditions with higher S.d. in mood measurements also show higher S.e. in the effect observed.

Is the MIPE an encoding effect? The presence of mood at message encoding seems to be highly relevant to the MIPE. Results of Bless, Mackie et al.'s (1992) first experiment together with Bohner and Apostolidou's (1994) results suggest that, under a non-evaluative processing goal, the MIPE is found only if mood is manipulated immediately before message presentation. No such effect has been found when mood is manipulated only before judgment. However, the results of Bless, Mackie et al.'s (1992) second study suggest that mood can also impact memory based-judgments. Even when mood was induced at the time of judgment, happy individuals seemed to engage in non-analytic processing. In fact happy individuals only differentiate between strong and weak arguments because they were first induced to attend to the quality of these arguments. Analytic processing occurred before the mood induction and judgment phases. Thus, it is highly likely that its output was retrieved as the basis for a non-analytic judgment. Because of that happy individuals offered answers very similar to the ones they would have given if they had engaged in more analytic processing.

Is the MIPE moderated by processing goals? Processing goals can also interfere with the relation between mood and mode of processing. A processing goal that requires focusing attention on the persuasive characteristics of each argument (message evaluation goal) seems to enable individuals in positive moods to overcome the tendency to engage in a less elaborative processing mode (Bless et al., 1990). In turn it is possible that processing goals that focus attention on non-persuasive characteristics of the message can result in individuals in neutral or negative moods showing no signs of having carefully analyzed the content of presented information. In fact, individuals in negative moods given a creative goal (Innes & Ahrens, 1991) or asked to focus exclusively on the non-semantic properties of the message (sound or speakers' quality -- Wegener et al., 1995) failed to differentiate between strong and weak arguments. Comparison of the attitudes of individuals in positive moods who listen to a message either with an evaluation goal or with a mere language comprehension goal revealed some tendency (although less than individuals in negative moods) to differentiate strong and weak arguments in the evaluation condition (Bless et al., 1990). However, it may be that there are also differences between different evaluative goals. Mackie and collaborators (Mackie & Worth, 1989; Worth & Mackie, 1987) showed a MIPE with a goal of evaluating the source performance. Batra and Stayman (1990) presented evidence of a MIPE when they asked individuals to evaluate not message content, but the relevant attitude. To better understand the MIPE, more must be known about the impact of processing goals on modes of processing and about how they interact with mood.

Does the MIPE depend on misattribution? Another piece of information relevant to the definition of the MIPE is furnished by this set of studies. Some studies suggest that the mechanism by which mood is related to mode of processing information may involve a mis-attribution process. It would seem that the fact that mood inductions have mainly been accomplished by explicit procedures makes this hypothesis unlikely. How can individuals who watch a comic film and then report their current mood not know what the source of their feelings is? However, it should be noted that mood induction is typically carried out as a totally separate task, and sometimes has even a totally unrelated experimenter. Such procedures, designed to avoid awareness of the goals of the study, may also have in some way prevented individuals being aware of the lack of relation between their feelings and the message processing task. Thus the MIPE might be depend on at least the absence of a conscious attribution of the current affective state to a previous external source. The only study that addresses this hypothesis (Sinclair et al., 1994), showed that making explicit the lack of relation between feelings and the current task eliminated the MIPE.

Is the MIPE moderated by motivational and capacity factors? Some of the studies summarized in Table 3.1 clearly suggest that motivation and capacity are able to moderate (qualify) the MIPE. Capacity deficits, such as those promoted by distraction, impact on processing mode, preventing even non-happy individuals from engaging in more analytic processing (Bless et al., 1990, Exp.2). In their two studies, Mackie and Worth (1989) manipulated individuals' capacity by restricting the time some participants had to read the message. They showed that although happy individuals processed argument quality differently from non-happy individuals when time was restricted, they differentiated between strong and weak messages when encouraged to take as much time as they wanted to read the message. Motivation to process seems also to moderate processing. Bless et al. (1990, Exp.1) instructed participants to pay attention to argument quality and elaborate on its content resulted in happy individuals engaging in analytic processing. However, Batra and Stayman's (1990) manipulation of need-for-cognition did not qualify the MIPE pattern. The influence of need-for-cognition on the relative impact of weak and strong arguments was merely additive to the influence of mood on that relative impact. Thus, the reviewed evidence does not seem to clarify very well the role of motivation and capacity factors on the MIPE. The studies seem to suggest that these two factors (capacity and motivation) may moderate the MIPE. However, none of the studies presented in Table 3.1 test the hypothesis that the MIPE is a direct effect rather than with being mediated by either motivational or capacity factors[11].

Is the MIPE affected by the direction of the persuasive message? The majority of the studies analyzed here presented individuals with what was intended to be a counter-attitudinal message. Only four studies used pro-attitudinal messages (Innes & Ahrens, 1991; Mackie & Worth, 1987; Rosselli, et al., 1995; Wegener et al., 1995). Unfortunately the studies do not allow a conclusive understanding of the effect of this variable[12]. Wegener and his collaborators (1995) confounded pro-attitudinal and counter-attitudinal messages with an uplifting and depressive tone rendering their results inconclusive. In Mackie and Worth's (1987) study, pro-attitudinal messages did not produce the same pattern of effects as did counter-attitudinal ones. However, the fact that this null effect

---

[11] Some of these studies (e.g. Mackie & Worth, 1989 and Bless et al., 1990) were designed with the goal of testing the hypothesis that capacity or motivational factors mediate the MIPE. Although motivational and capacity effects in factorial designs could arise from the fact that the factors mediate processing, the fact is that they suggest only moderation effects.

[12] One possibility is that individuals give more careful scrutiny to arguments supporting positions with which they disagree (mismatching previously received information) than to arguments supporting positions they like. In this case, the MIPE would be expected to be stronger with counter-attitudinal arguments than with pro-attitudinal ones. The differences in Mackie and Worth's (1987) study, although not reliable, are in this direction. This may thus be a point to explore more carefully in future studies.

might result from ceiling effects in the attitude measurement renders it inconclusive. In fact, Rosselli et al.'s (1995) results suggest that the impact of argument quality on attitude change was not qualified by message direction. Happy individuals only tended to be persuaded by one message direction more than the other. Innes and Ahrens's (1991-Exp. 2) study suggests a reliable MIPE associated with a pro-attitudinal message. So, in general, there seem to be no evidence that the MIPE is differently associated with pro- or counter-attitudinal messages.

Further support for the idea that positive mood is related with non-analytic processing comes from evidence associated with heuristic manipulation. Happy individuals' judgments are expected to be more sensitive to manipulation of the presence or absence of a heuristic cue than those in neutral or negative mood states. Of the five studies that allow evaluation of this hypothesis, four explicitly manipulated the expertise of the source of the persuasive message (Bodenhausen, Sheppard, et al., 1994; Mackie & Worth, 1989; Worth & Mackie, 1987) whereas the other gave individuals information regarding consensus (Bohner et al., 1992). Bodenhausen and collaborators' (1994) results suggest only that neutral and sad mood individuals do not rely on such cues to make their judgments, as they did not induce good mood. Mackie and Worth (1987, 1989) suggest that individuals in happy moods rely more exclusively on the heuristic cue as a base for their judgments than those in neutral moods. Bohner et al.'s (1992) happy individuals were not affected by either argument quality or by consensus, although unhappy individuals were affected by both of these.

Two sets of reviewed studies failed to replicate the association between a positive mood and a non-analytic processing[13]. In three studies presented by S. M. Smith and Shaffer (1991), mood never interacted with argument quality factor. However, it must be said that no other important results were replicated either. In fact a) in their first and third studies, argument quality had no impact on agreement or disagreement with the message; b) in the first study motivation level had no influence on agreement with the position advocated; c) in the second study heuristic manipulation had no effect on attitudes, and d) in the third study the attribution of mood to a source other than the message had no effect on agreement with the message. Wegener et al.'s (1995) results are stronger. The results of their first experiment are the opposite of what is typically found: individuals in positive moods seem to differentiate more between strong and weak messages than individuals in negative moods[14]. The inverted pattern of the interaction between mood and argument quality found in the first study was also contributed to by non-happy individuals processing the message content non-analytically. This inversion was, however, not replicated in their second study. What was replicated was elaboration under positive affect. This happened in a condition where participants received a message

[13] Petty and his collaborators (Petty, Schumann, Richman, & Strathman, 1993) published two studies that manipulated argument quality and mood with no reference to any interaction between these variables on any of the dependent measures used (attitude change and cognitive responses). Since no means or analyses associated with this interaction were presented, these studies could not be included in this review.

[14] These results suggest that happy mood can also increase processing. It thus challenges the view that happy individuals engage in non-analytic processing. Some other studies have also been argued to sustain the hypothesis that happy mood can increase processing (Mathur & Chattopadhay, 1991; Murray, Sujan, Hirt, & Sujan, 1990). Unfortunately these studies cannot be easily related with the MIPE since neither their design nor dependent measures are diagnostic of a dual-process distinction.

they expected would make them "happy " (uplifting/pro-attitudinal condition). That is, this effect occurred when happiness was attributed to an external source.

Mood and the use of "previous" knowledge: Priming, Stereotype, Expectancy based illusory correlations and Scripts

Non-analytic processing, in contrast to analytic processing, is essentially a reproductive, top-down, process. The nature of the information that influences non-analytic judgments vary from simple concepts to more highly organized memory structures such as stereotypes and scripts. How individuals process information may, thus, be inferred from the degree with which this more or less structured information impacts on judgments. Whereas non-analytic judgments are essentially determined by individuals previous knowledge, analytic judgments integrate information activated in memory with more actual and detailed stimulus information. Several studies have investigated the impact of activating such previous stored information on processing. Those whose dependent measures included an assessment of the impact of previous knowledge on performance are, thus, informative of whether information is processed analytically or non-analytically.

Currently presented information (a prime) is not only more accessible in memory later but also activates related material and functions as a context for other subsequent tasks. This context has been shown to impact the subsequent task (called a priming effect, Neely, 1976; Posner & Snyder, 1975). One such impact is to facilitate processing by allowing individuals to engage in less analytic, more top-down, processing. By facilitating information processing, previously activated information not only reduces the latency of responses but also directly influences the characteristics of individuals' responses. These facilitation effects are however expected to depend on information processing mode. Engagement in non-analytic processing is expected to favor such an effect, since it renders individuals more likely to rely on relevant knowledge activated in memory, rather than attending to specific details of the currently presented information. Thus, mood can be expected to moderate priming effects such that positive moods facilitate them and non-positive moods reduce them.

The degree of impact of more organized information in memory, such as stereotypes, is also expect to reflect the mode with which information was processed. The reliance on stereotypes as a basis for perceiving and judging others reflects a non-analytic, simpler processing mode (Bodenhausen, 1988, 1993; Bodenhausen & Wyer, 1985). The use of stereotypes is thus expected to be associated with positive mood. Individuals in neutral or negative moods who engage in more extensive and analytic processing of information should pay more attention to individuated information and rely less on the implications of the stereotype. Several studies have independently manipulated mood and stereotype. All of them investigated the impact of stereotypic information on some type of judgments. Most commonly, studies have assessed the impact of a valenced stereotype on some evaluative judgment. Other studies have assessed the impact of stereotypes on the degree of illusory correlation[15] observed. Expectancy-based illusory correlations are defined as an overestimation of the number of "occurrences" that are stereotypic-congruent. Greater expectancy-based illusory correlations suggest an increased reliance on pre-existing stereotypes in making

[15] Distinctiveness based illusory correlations are not easily fit into the distinction between more analytical or less analytical processing. For this reason no reference to this effect is considered here.

judgments (Hamilton et al., 1993). Other examples of very general stereotype use occur in judgments of group variability. Although there is no theoretical approach that directly associates variability judgments with different modes of processing, these studies may also be informative about processing differences of individuals in positive and non-positive moods. Appropriate variability judgments seems to require deliberative processing of incoming information, which in turn requires capacity (Stroessner & Mackie, 1992). If this is so, variability judgments made by people in positive moods are expected to be less accurate than those made by people in other mood states.

Recognition memory judgments have also been considered to be associated with two modes of processing information (e.g., Jacoby & Kelly, 1987, 1990; Mandler, 1979, 1980, 1981). In Mandler's view, recognition results from either an elaborative process or an activation/integration process. This second mode of processing operates on already established mental representations (such as scripts) leading to an integration of the stimulus features with the mental representation. Although an elaborative processing mode can also be associated with the activation of a mental representation, it provides less evidence of integration. Different modes of processing are also expected to result in different levels of retention of detailed information. An elaborative process should be associated with better retention of the details of information. Some evidence for this hypothesis comes from the script-based memory retrieval effect. Script processing is known to increase not only "hits" (true recognitions) but also "false alarms" (false recognitions) for the recognition of typical or expected information (Graesser, Gordon, & Sawyer, 1979). The relation between hit and false alarm rates provides a measure of memory discrimination. The greater the difference between the hit rate and the false alarm rate, the better the discrimination[16]. The better the discrimination the better *retention* is assumed to be. Results show that although hit rates do not vary as a function of information typicality, there is an exponential increase in false alarm rates (Graesser, Woll, Kowalski, & D. A. Smith, 1980). Because of such a direct relation between the number of false alarms and typicality, retention is expected to decrease as typicality increases.

Table 3.2 summarizes MIPE studies that were developed by looking at mood's impact on priming effects and on the use of two general knowledge structures: those related with stereotype activation and those related with the use of scripts[17]. It provides information about mood induction, mood check procedures, experimental design, and experimental procedures. Results are focused on the effects of mood on variables known to reflect a greater or lesser impact of established knowledge structures on processing, such as reaction times, illusory correlations, recall, recognition, and trait judgments.

---

[16] Whenever the number of items used allows, memory discrimination or sensitivity can be represented by the sensitivity score d' which is calculated by subtracting the hits and false alarms and dividing the difference by an estimate of response variability (Green & Swets, 1966; Kintsch, 1977).

[17] Attitudes have also been defined as more or less complex knowledge structures (e.g., Fazio, 1986; McGuire, 1964). When the evaluation of a previously encountered object is required, it may be merely retrieved instead of being re-computed on the basis of object attributes (Fazio, 1986; Hastie & Park, 1986). Individuals engaged in non-analytic processing are more likely to base evaluations merely on directly accessible attitudes than those engaged in more analytic processing. Consistent with this idea, Rosselli et al.'s (1995) study showed that happy individuals' prior opinions had a larger impact on their final attitudes than the prior attitudes of non-happy individuals (see Table 3.1).

Table 3.2 : Summary of mood studies developed in the previous knowledge influence of judgments field

	Mood induction and check procedures (HM-Happy mood; NM- Neutral mood; SM- Sad mood; CM-Control)	Design and procedure (Ss - Subjects; RT - Reaction times)	Relevant results (significant: marginal+)p<.05*, p<.01**; p<.005***)
Priming			
Fiedler, Asbeck. & Nickel **(1991)**	**Induction**: Affective stimuli presentation (12 m) - humorous sequence of films (HM); depressing sequence of film (SM). **Check**: After video, Ss indicated their momentary emotional state on a 128 mm graphical rating scale labeled very depressed-very elated: HM=79.96; SM=24.29.	**2 (mood) x 2(questioning about positive vs negative traits) x 2 (evaluation on positive and negative dimensions)** **Procedure:** 1- Ss read a target person description; 2- mood manipulation as filler task; 3- half of Ss rated target on positive adjectives and other half on negative adjectives; 4- Ss rated on what extend they think that a set of positive and negative behaviors are related with the positive or negative adjectives previously used to described the target.	*Mood x Questioning x Scale valence interaction* + : questioning valence leads to congruent valence ratings only in HM condition. *Mood Main effect* ** : More positive ratings for HM than for SM Ss. *Mood x Scale valence interaction* * : The most extreme ratings of HM Ss are more accentuated with regard to negative behaviors.
Bless & Fiedler **(1995)** **Exp. 1**	**Induction**: Vivid and detailed written report (15m) of a happy (HM), a sad (SM) life event or a normal day life event (NM). **Check** : Immediately after induction. "How do you feel right now"- 11-point scale (very bad to very good). HM= 8.8; NM=8.0; SM=6.9.	**3 (mood) x 2 (familiar vs unfamiliar targets) x 2(primed vs unprimed words)** **Procedure.** After mood induction and check, Ss were asked to think about a very well known (familiar) or a not very well known person (unfamiliar) and rated how much some attributes (trait or specific behaviors) applied (1-not at all; 9-very much). Traits matched to behaviors appeared one or two trials earlier, in priming condition. RT were collected.	*Mood x Priming interaction* * : HM Ss showed a stronger prime effect (short RT for prime words). SM did not present any prime effect.
Bless & Fiedler **(1995)** **Exp. 2**	**Induction**: HM and SM was induce as in Exp.1 **Check** : As in Exp.1. HM= (...); SM= (...).	**2 (mood) x 2(primed vs unprimed words)** **Procedure.** After mood induction and check, Ss judged if a concept presented on a computer screen was, "appear within the last 5 trials or not". Traits matched to behaviors appeared two or three trials earlier, in priming treatment. RT were collected.	*Mood x Priming interaction* ** : All Ss showed an inverse prime effect (short RT for unprimed adjectives) more accentuated in HM than in SM condition.

Stereotypes

Mackie, Hamilton, Schroth, Carlisle, Gersho, Meneses, Nedler, & Reichel **(1989)** **Exp. 1**	**Induction**: Affective stimuli presentation (4m) - humorous film (HM); depressing film (SM); informational film (NM). **Check:** After film Ss rated "how do you feel now" (1-sad; 9-happy): HM= 6.93 ; SM= 5.68 ; NM=5.87 .	**3 (mood) x 2 (trait valence) x 2 (stereotype and non-stereotype traits) x 4(versions).** **Procedure:** After mood induction and check, Ss read 32 sentences describing a member of one of 4 different occupations, either with two positive or negative traits (at a rate of 6s each). Ss estimated the number of times they saw each trait paired with each of the 4 occupations.	*Mood x Trait valence x Stereotyped traits interaction* : relative to NM, HM show greater stereotypic biases*** (but only with negative attributes). SM show greater illusory correlation*** than NM with positive traits but not with negative ones.
Mackie, et al. **(1989)** **Exp. 2**	**Induction**: Affective stimuli presentation- humorous film (HM); depressing film (SM); informational film (NM). **Check:** After film Ss rated "how do you feel now" (1-sad ; 9-happy): HM= 6.52 ; SM= 3.37 ; NM= 5.90 .	**3 (mood) x 2 (trait valence) x 2 (stereotype and non-stereotype traits) x 4(versions).** **Procedure:** As Exp.1 but on computer presentation so RT could be measured.	*Planned contrast associated with the Mood trait congruence x Stereotype and Non-stereotype traits interaction* + : Illusory correlations in mood congruent conditions smaller than in mood incongruent conditions. *(No effect of stereotype biases)*
Forgas & Moylan **(1991)**	**Induction** : Affective stimuli presentation (10m)- humorous film (HM); depressing film (SM); informational film (NM). **Check:** After film. Embedded in the film survey. Ss rated their "current mood" on three7-point scales (happy-sad; good-bad; satisfied-dissatisfied) : HM= 2.45 ; SM= 3.76 ; NM= 5.03 .	**3 (mood) x 2 (same-race, mixed-race couples)** **Procedure:** After mood induction and check, Ss viewed pictures of Caucasian, Asian or mixed couples. Ss evaluated each member of the couple on a bipolar scale (9-points) combined into two measures: competence and likeability.	*Mood x Racial match interaction:* Mood congruence effect on competence ** and likeability ** observed only in the mixed race couple condition.
Forgas **(1992a)**	**Induction:** Affective stimuli presentation (10m) - humorous film (HM); depressing film (SM); informational film (NM). **Check:** After film. Embedded in the film survey. Ss rated their "current mood" on three7-point scales (happy -sad; good-bad; satisfied-dissatisfied). HM= 2.53; NM=3.68; SM=4.87.	**3 (mood) x 2 (high vs low prototypically)** **Procedure:** After mood induction and check, Ss formed impressions (on 3 dimensions: evaluative, extroversion, and competence) of people consistent or inconsistent with familiar prototypes. Then performed an interference task (arithmetic items) and a cue-recall memory test.	*Mood x Prototypically interaction* HM show better recall ** of typical targets SM , and NM of atypical targets. SM impressions** (on the 3 dimensions) of atypical targets were worse than of typical targets. HM impressions * (on evaluative and extroversion dimensions) of typical targets were better than of atypical targets.
Stroessner & Mackie **(1992)** **Exp.1**	**Induction**: Affective stimuli presentation(4m) - humorous film (HM); depressing film (SM); wine corking film (NM). **Check**: After video. Embedded in film survey. Ss were asked to rate, "how did the video make you feel" and "how do you feel now" on a 9-point scale (sad-happy): HM=6.72; NM=5.73 ; SM=3.14.	**3 (mood) x 2 (high vs low variability)** **Procedure:** Ss were presented with one of two sets of 28 behaviors typical performed by members of a target group. Two sets of behaviors belonging to two trait dimensions varied only on their perceived variability (high vs low) . Ss rated on 9-point scale group's sociability, intelligence, and general group perceived variability.	*Mood x Variability interaction:* HM and SM Ss saw the groups as equally lacking in variability ** in opposition to NM Ss. HM Ss perceived low variability group (LV) as less variable than what was perceived by NM and SM Ss. With regard to estimates in both traits + they were higher for LV than HV only in the NM condition.

Stroessner & Mackie **(1992)** **Exp. 2**	**Induction**: Affective stimuli presentation(5m) - humorous film (HM); depressing film (SM); historical documentary (NM). **Check**: After video. Embedded in film survey. Ss were asked to rate, "how did the video make you feel" and "how do you feel now" on a 9-point scale (sad-happy): HM=6.90; NM=5.66 ; SM=3.93.	**3 (mood) x 2 (high vs low variability) x 2 (stereotype and non-stereotype traits) x 2 (positive vs negative traits).** **Procedure:** As in Exp.1, except that group was identified as sorority and traits were stereotypic or not, and positive or negative). After ratings Ss had 4 m to recall all target behaviors.	*Mood Main effect* + : Ss in NM and SM recalled more behaviors than HM Ss. *Mood x Stereotype interaction* * : Only HM Ss rated the stereotypic traits as more characteristic of the group. *(Mood x Variability interaction: with regard perceived variability: same pattern of Exp. 1 did not reach significance.)*
Bodenhausen, Kramer, & Susser **(1994)** **Exp. 1**	**Induction**: Vivid and detailed written report (12 m) of a happy (HM) life event or a mundane event (NM). **Check** : Before experimental task within a demographic questionnaire. On a 7 point scale Ss rated how well the adjective happy describe them at the moment. HM= 4.29 ; NM= 3.72.	**2 (mood) x 2 (stereotype present vs. absent) x 2(scenarios)** **Procedure:** After mood induction and check, Ss were asked to judge the misconduct of a target (a fellow student). To half of the participants the target was identified as a member an athletic to other half as a member of a Hispanic group. The target misconduct was either typical of one group or of the other group. Then Ss rated the likelihood of target's guilty .	*Mood x Stereotype interaction* + : HM, but not NM, perceived target as guiltier in the stereotypic than in the non-stereotypic condition.
Bodenhausen, Kramer, & Susser **(1994)** **Exp. 2**	**Induction**: Facial posing task-contraction of the "smile" (HM)) and contraction of their dominant hand (NM). **Check**: As Exp. 1. HM=4.62; NM=3.76.	**2 (mood) x 2 (stereotype present vs. stereotype absent) x 2(scenarios)** **Procedure**: As in Exp. 1	*Mood x Stereotype interaction* + : HM, but not NM, perceived target as guiltier in the stereotypic than in the non-stereotypic condition.
Bodenhausen, Kramer, & Susser **(1994)** **Exp. 3**	**Induction:** On an "unrelated study" Ss listen to a happy and exciting (HME) or a happy and calm music(HMC). **Check**: Pre-test on a different group having a control group (N). Ratings on happiness: HME=5.67; HMC= 5.91; N=4.50. Ratings on energetic: HME=5.33; HMC= 3.46; N=2.80.	**2 (arousal) x 2 (stereotype present vs. stereotype absent) x 2(scenarios)** **Procedure**: As in Exp. 1	*Main effect of Stereotype* * : All Ss perceived target as guiltier in the stereotypic than in the non-stereotypic condition.
Bodenhausen, Kramer, & Susser **(1994)** **Exp. 4**	**Induction**: Vivid and detailed written report (12 m) of a happy (HM) life event, or a mundane event (NM) . **Check** : As Exp. 1 . HM= 6.76 ; NM= 6.06.	**2 (mood) 2 (stereotype present vs. absent) x 2(scenarios) x 2 (accountability: low vs high)** **Procedure**: As in Exp. 1, but at the end of the instructions half of the subjects were told that their judgment was anonymous and other half that they would have to justify their judgment.	*Mood x Stereotype x accountability interaction* * : HM perceived target as guiltier in the stereotypic than in the non-stereotypic condition, only in the low accountability (low motivation) condition.

Bodenhausen, Sheppard, & Kramer **(1994)** **Exp. 1**	**Induction:** Vivid and detailed written report (12 m) of an angry (A) or a sad (SM) life event, or mundane event of the previous day (NM). **Check:** Before experimental situation within a demographic questionnaire. On a 7 point scale Ss rated how well the adjectives sad and irritated describe them at the moment. Sad: SM= 2.48 ; NM= 1.62 (=A); Irritated: A= 1.98 ; NM= 1.33 (=SM).	**3 (affective states) x 2 (stereotype present vs absent) x 2 (scenarios).** **Procedure:** As in Bodenhausen, Kramer &, Susser (1994, Exp.1).	*Affect x Stereotype interaction *:* Angry Ss, but not NM or SM, perceived target as <u>guiltier</u> in the stereotypic than in the non-stereotypic condition.
Forgas **(1995a)** **Exp. 2**	**Induction:** Affective stimuli presentation (10m) - comedy series (HM); sport injury film (SM); lecture on art (NM). **Check**: After film. Embedded in a film survey. Average of "current mood" ratings on three 7 point scales (happy-sad; good-bad; satisfied-dissatisfied). HM= 2.36; NM=3.57; SM=4.77.	**3 (mood) x 2 (typical vs atypical targets)** **Procedure:** After mood induction and check, Ss look at 4 couples with the goal of indicating their perception of them . After a filler task (read about art) Ss write down as many details as they could recall of each of the 4 couples.	*Mood x Typicality interaction ** :* HM show better <u>recall</u> of typical targets; SM and NM of atypical targets.
Forgas **(1995a)** **Exp. 4**	**Induction:** False feedback - Ss told they had performed above average (HM) or below average (SM) on a test of verbal abilities or that the test was being pre-tested. **Check**: As in Exp. 2. HM= 2.67; NM=3.81 ; SM=4.89.	**3 (mood) x 2 (typical vs atypical targets)** **Procedure:** After mood induction and check, Ss look at 4 couples with the goal of forming an impression of them and of their relationship. Target impression was rated on 5 bipolar scales (likable, competent, self-confident, happy, sincere) and targets relationship on others 5 bipolar scales (superficial, happy, balanced, trusting, cooperative). An experimenter recorded latencies for each Ss responses by looking at a clock. After a filler task Ss recalled details of each couple.	*Mood main effect:* Compared to NM, HM took less and SM more <u>time to analyze target information</u>** and to <u>make judgments</u>** *Mood x Typicality interaction-* Compared to NM, HM took less <u>time to analyze information</u>** and to <u>make judgments</u>* of typical targets, and SM took more time with regard atypical targets. Compared to NM, HM show better <u>recall</u> ** of typical targets, and SM show better recall of atypical targets.
Bless, Schwarz, & Wieland **(1996)** **Exp. 1**	**Induction**: Vivid and detailed written report (15m) of a happy (HM) or a sad (SM) life event or a normal day life (NM). **Check** : After inducement. "How do you feel right now"- 9-point scale (very bad to very good). HM= 8.6; NM= 7.8; SM=7.1.	**3 (mood) x 2 (positive vs negative category) x 2(positive vs negative individuating information)** **Procedure:** After mood induction and check, Ss listened to a 3m description of a target with the goal of answering some questions about it. Half Ss were told (5 times) that target was a "Greenpeace representative" and other half that he was a "manager of a chemical company". Descriptions had either 6 positive and 2 negative behaviors or 6 negative and 2 positive behaviors. Using 9-point scales targets were evaluated on 4 dimensions that compound global evaluative score. A surprise recall test was presented at end.	*Mood x category x individuating information:*** : Different mood states made different use of categorical and individuating information on their <u>evaluations</u>. SM did not use categorical information, NM used the two types of information additively, and HM use of individuating information depended on categorical information (positive category intensify the negativity of behaviors). *(No effects in recall)*

Bless, Schwarz, et al. **(1996)** **Exp. 4**	**Induction**: Vivid and detailed written report (15m) of a happy (HM) or a sad (SM) life event. **Check** : After inducement. "How do you feel right now"- 9-point scale (very bad to very good). HM= 8.5; SM=7.6.	**2 (mood) x 2 (positive vs negative category) x 2(positive vs negative individuating information) x 2 (category label at beginning at end)** **Procedure:** As in Exp.1, except that category label was mentioned only three times and either in the beginning or at the end of the person description.	*Two separate mood x category x individuating information interactions*: When category label was at the beginning, pattern of interaction replicated * results of Exp.1. When category label was given at end, it did not replicate.
Scripts			
Bless, Clore, Schwarz, Golisano, Rabe, & Wolk **(1996)** **Exp. 1**	**Induction**: Vivid and detailed written report of a happy (HM) or sad (SM) life event (12m). **Check** : After inducement: "How do you feel right now"- 9-point scale (very bad to very good). HM= 7.1; SM=5.4 After filler task: Mood differences dissipates	**2(mood) x 2 (encoding vs retrieval)** **Procedure:** Ss were involved in 4 different tasks: mood induction; script (restaurant) presentation; filler task and a recognition task regarding typical (script related) and atypical items. Mood and filler tasks were counterbalanced to induce mood at encoding or retrieval.	*Mood Main effect* *: HM Ss were more likely to recognize (incorrectly) a typical item than were SM Ss. *(No effect with atypical items)* *(No order effect)*
Bless, Clore, et al. **(1996)** **Exp. 2**	**Induction:** *(Repeated in two different moments)* Affective stimuli presentation- humorous film (HM), depressing film (SM); informative documentary (NM) **Check:** After each inducement: "How do you feel right now"- 11-point scale (sad to happy): HM1= 8..9; HM2=9.0; NM1= 7.6; NM2=7.7 ; SM1=7.2 ; SM2=6.4 .After filler task: mood differences dissipated.	**3 (mood) x 3 (d2 before mood, after mood alone vs after mood+with script)** **Procedure:** Ss were involved sequentially in the following tasks: a "secondary task" (the d2 concentration test - which required high capacity resources), a mood induction task, a repetition of d2, a repetition of mood induction, a dual-task (d2 simultaneously with script presentation) ; a filler task and a recognition task regarding typical (script related) and atypical items.	*Mood Main effect* * : HM Ss were more likely to recognize (both incorrectly and correctly) a typical item than were SM Ss. NM Ss fell in between. *(No effect with atypical items* *2-way interaction* * : HM Ss show better performance on d2 than NM and SM Ss, only when this task was done simultaneously to script presentation.
Bless, Clore, et al. **(1996)** **Exp. 3**	**Induction:** As Exp. 2 **Check:** After each inducement: "How do you feel right now"- 11-point scale (sad to happy): HM= 8.7; 8.9; SM=6.9 ; 6.0. After filler task: mood differences dissipates	**2 (mood) x 2 (low vs high level of atypicality items) x 2 (d2 before mood, after mood alone vs after mood plus with script).** **Procedure:** Same as Exp. 2.	*Mood Main effect* * : HM Ss were more likely to recognize (both incorrectly and correctly) a typical item than were SM Ss. *(No effect with atypical items* *Level of atypicality x d2 as single or simultaneous task interaction* * : High level of atypicality had a stronger detrimental impact on d2 performance when this task was performed at the time of script presentation. *.Planned contrasts associated with 3-way interaction* * : When d2 was simultaneous to script, HM performance on d2 was better than SM only with low level on atypicallity. *(No effect when d2 alone)*

These studies show that happy people rely more on activated previous knowledge than non-happy people. Primed information had greater impact on happy individuals' judgments than on the judgments of non-happy individuals. Happy individuals were also much more sensitive to the valence of the available information than non-happy individuals, reacting more extremely to negative than to positive information. These studies also show happy people's greater reliance on stereotypes and other knowledge structures. Judgments were more influenced by expectancies or other knowledge structures if processors were in positive moods, which reduced the latencies of those judgments. Stereotype activation biased the perceived distribution of group members' attributes (and so induced illusory correlation) and behaviors (and so induced stereotypic judgments). Category information had more impact on happy individuals' judgments than did individuating information. Script activation biased memory for related and unrelated items, but these effects were more accentuated in individuals in positive moods. These effects have been observed with a variety of mood manipulations (presentation of humorous or depressing video-clips, vivid recall of positive and negative scenarios, facial muscle contraction, and music presentation).

All except one[18] of these studies clearly suggest that happy individuals process information differently from non-happy individuals. In general, these studies suggest that individuals in neutral moods are less influenced by information activated in memory, rely less on activated general knowledge structures and rely more on individuating information. Most of the studies also argue that mildly negative feelings induce such analytic processing. Only Stroessner and Mackie (1992, Exp1) found an identical,

[18] The only study that did not presented a MIPE was developed by Forgas and Moylan's (the only mood effect was not a MIPE but that in a relatively effortful condition, mood congruency effects were done).

detrimental, effect for happy and sad individuals: both happy and sad individuals perceived less variability in the behavior of group members than individuals in a neutral mood condition. However, this symmetrical pattern that was not fully replicated in their second study.

Together the studies summarized in Table 3.2 allow us to address many of the same issues raised by the persuasion studies. They also help to clarify the role motivation and capacity factors may have on the effect.

Is the MIPE a small effect? The majority of the studies presented on Table 3.2. do not suggest so. In general the MIPE seems to be more easily detected in these studies than in the persuasion literature. Why is this so? First, whereas in the persuasion studies the MIPE was identified by a between subjects difference, in the studies summarized in Table 3.2, MIPE variability is assessed by individual variability (represented by a measure of the degree of impact general structures activated in memory have on individual performance). Second, the majority of studies in Table 3.2 did not use evaluative judgments as dependent measures. Among those that did, the impact of mood on mode of processing was not easily detected in three (Bodenhausen, Kramer, et al., 1994, Exp.1, Exp.2 ; Fiedler et al., 1991). It may thus be that the nature of the tasks in which individuals engage also makes the MIPE easier or more difficult to detect. Recall that in persuasion studies, the nature of the task is also judgmental. These two points may thus corroborate the idea that the association between mood and processing mode is quite strong, but current methods of measuring processing mode lack precision.

Is the MIPE an encoding effect? Generally in all studies mood effects are associated with mood being induced at time of encoding relevant information. Manipulating the timing of mood induction, Bless, Clore et al. (1996, Exp.1) found that the differential reliance of happy and non-happy mood processors on script use occurs both when mood is present at encoding and when mood is presented only at the time recognition judgments are made. Thus, even when mood is induced only at the time of retrieval, performance in a recognition task is also affected by current affective states[19].

Is the MIPE affected by the nature of information processed? The studies with illusory correlation suggest that the valence of information influences not only reliance on established knowledge structures, but also the MIPE's pattern. Evidence of greater illusory correlations suggests an increased reliance on preexisting stereotypes in making judgments (Hamilton et al., 1993). The impact of mood on illusory correlations reflects the fact that happy individuals are more affected by expectancies than individuals in neutral moods. However, these results seem to depend on the valence of the stereotypic information. Information valence moderates the MIPE, since incongruence between feelings and stimuli makes processing more difficult. In fact, differences regarding the time taken to process stereotypic and non-stereotypic sentences were found only when sentence valence was incongruent with the perceiver's feelings (Mackie et al., 1989, Exp.2). However, if individuals in positive moods were more affected by stereotypes only when the target traits were negative, a symmetrical effect was obtained for those in negative moods. Individuals in negative moods who read positive characteristics about

---

[19] The different impact of mood at judgment in this study and in the persuasion studies might rely on the difference between the two kinds of judgments involved. Although attitudinal judgments can be made online, recognition judgments cannot.

group members were more subject to stereotypic biases. These results suggest a different pattern for the MIPE which is consistent with the capacity explanations of both positive and negative moods impact on processing information (Ellis, Thomas & Rodriguez, 1984; Ellis & Ashbrook, 1988; Mackie & Worth, 1988, 1989). The study developed by Fiedler and his collegues (1991) also manipulates the valence of previously presented information. Although this information influenced judgments, the study does not suggest that valence qualified the impact of mood on how information is processed.

Is the MIPE moderated by motivational and capacity factors? Whereas Bodenhausen and collaborators (1994, Exp. 4) provide further evidence suggesting that motivation moderate the MIPE, Bless and collaborators help make this moderation effect clear by ruling out the mediational hypothesis. In fact, both these sets of studies (Bless, Schwarz et al., 1996; Bless, Clore et al., 1996) seem to suggest that the MIPE is a direct effect. At the same time that positive mood increased confidence in general knowledge structures, neither motivation nor capacity to process was impaired. In the first set of studies, happy individuals (although seeming to rely more on categorical information) elaborated on the discrepancy between the categorical and individuating information, which required considerable cognitive resources and motivation to process. In the second set of studies performance on a "secondary task" (task intended to measure cognitive effort) was measured to infer participants' motivation and capacity status. If positive mood induces motivational or capacity processing deficits, these deficits should have influenced the secondary task performance. This did not happen. Instead the efficiency that resulted from script-based processing freed up resources for the secondary task, resulting in better performance. In addition happy and sad individuals seemed equally involved in the recognition task since differences in performance were found only with regard to typical items and not atypical items. Thus, mood seems to influence how participants deal with received information without affecting either their capacity and motivation to engage in a more systematic, analytical mode of processing. The impact of motivational and capacity factors on the MIPE have, thus, only a moderation status.

Mood and Causal Attribution

How individuals perceive the causes of other people's behaviors has also been regarded as the product of dual processing modes. Gilbert (1989) suggested that dispositional (internal) inferences are a result of a type of processing which requires minimal effort and resources. Individuals can engage in such processing even if their capacity is limited or if they have no reason to think deeply about the target person. In contrast, more processing effort is necessary to take external causes of behavior into account. Thinking about situational causes requires additional processing of environmental information and a possible discounting of the initial dispositional inference made. Thus the characterization of individuals by their behavior is understood to be an easier process than the one that encompasses the use of causal thinking to correct those impressions. This reasoning suggests that whereas internal attributions are not very diagnostic of the amount of effortful associated with processing, situational attributions for behavior require more effortful processing (Gilbert, 1989).

Given that non-analytic processing is assumed to require less processing effort than analytic processing, it may be that internal attributions are more prevalent in the non-analytic processing mode and external attributions are more prevalent in more careful analytic processing. If so, differences in patterns of perceived "locus of control" of a behavior may suggest the engagement of different modes of processing.

Table 3.3 summarizes the set of studies that manipulate mood in experimental contexts associated with causal attribution. Relevant results are considered in relation to the internal or external nature of attributions made, and more specifically, with the occurrence of dispositional versus non-dispositional attributions.

Table 3.3 : Summary of mood studies developed in the causal attribution field

	Mood induction and check procedures (HM-Happy mood; NM- Neutral mood; SM- Sad mood; CM-Control)	**Design and procedure** (Ss - Subjects)	**Relevant results** (significant: marginal+; p<.05*, p<.01**; p<.005***)
Sullivan & Conway **(1989)** **Exp. 1**	**Induction:** Vivid autobiographical recall (8m) - Ss recalled two experiences either that made them feel "really good" (HM) or "really bad" (SM). The third group described two different routes they get to school (NM) **Check:** Following experimental task. Combined score of ratings on 9-point scales on 4 positive (*delighted, energetic, happy, pleased*) and 4 negative (*dissatisfied, gloomy, sad, uneasy*) adjectives. Means of negative scores were subtracted from means of the positive scores. HM= 3.6 (= NM); SM= 1.5.	**3 (mood) x 2 (valence of target behavior)** **Procedure:** After mood inducement, Ss listened to an audiotape of two positive and two negative behavior descriptions. Ss wrote down several possible causes of each behavior. These causes were classified as dispositional vs situational.	*Pairwise comparisons on mood main effect* : SM Ss made more dispositional attributions than HM* and than NM+.
Sullivan & Conway **(1989)** **Exp. 2**	**Induction:** As Exp. 1 **Check:** Following experimental task. Combined score of rates on a 9-point scale of 4 positive (*good, happy, pleased, refreshed*) and 3 negative (*discouraged, miserable, sad*) adjectives. Means of negative scores were subtracted from means of the positive scores. HM= 2.6; NM= 3.1 SM= 1.3.	**3 (mood) x 2 (valence of target behavior)** **Procedure:** Same as Exp.1.	*Mood x attribution type interaction* ** : SM Ss made more dispositional attributions than HM and NM Ss. No differences on the number of nondispositional attributions.

Forgas, Bower, & Moylan **(1990)** **Exp. 1**	**Induction:** False feedback - Ss told they had performed above average (HM) or below average (SM) on a test of verbal abilities or that the test was being pre-tested. **Check:** After mood manipulation . Ss rated how they felt on a 7 point scale (1-happy;7-sad). HM= 2.03; NM= 3.27; SM= 5.98.	**3 (mood) x 2(success vs failure)** **Procedure:** After mood ratings, Ss read eight of Kogan & Wallach (1964) life dilemmas, with a success or failure outcome. Ss rated on a 7 point scale how important 4 causal factors (ability, effort, difficulty of situation, luck) were.	*Mood main effect* ** : HM made more internal attributions (ability and effort) than NM and SM did. *Mood x outcome interaction* * : Mood effect was more evident when outcome was success.
Forgas, et al. **(1990)** **Exp. 2**	**Induction:** Affective stimuli presentation - humorous film (HM), depressing film (SM) or no film (NM) **Check:** After mood inducement. On a 7-point scale (1-happy; 7-sad). HM= 2.69; NM=3.39; SM= 4.40.	**3 (mood) x 2(success vs failure) x 2 (self vs other)** **Procedure:** After mood ratings Ss indicated whether they were satisfied with their exam performance in the pre-requisite course and their attribution (on 7 point scales: ability, effort, difficulty of situation, luck) of their own and others' performance.	*Mood main effect* * : HM Ss made more internal attributions than SM. *Mood x Outcome x target interaction* **: HM Ss made more internal attributions for success and external attributions for failure, regardless of target. SM Ss reversed that pattern for the self. NM made more internal attributions for the self following success.
Curren & Harich **(1993)**	**Induction:** Affective stimuli presentation (8m) - humorous film (HM), war film (SM). **Check:** After mood inducement. Embedded in a questionnaire about the film. Ss rated their "current mood" on two 7-point scales (sober-amused; positive negative). HM= 6.5; 1.8; SM= 1.8; 6.0.	**2 (mood) x 2(success vs failure) x 2 (importance high vs low)** **Procedure:** Before mood induction, Ss performed a product evaluative task believing that their analytical ability was tested (high importance) or not (low importance). After mood induction they received false positive or negative feedback about performance and were asked to name reasons for their performance and to use Russell's (1982) Causal Attribution scale to measure internality of their attributions.	*Mood main effect* * : HM Ss made more internal attributions than SM. *Mood x Outcome x Importance interaction* ** : In unimportant set mood effect was only present for success whereas in the important set mood effect was only present for failure.

Table 3.3 summarizes the studies developed in the attribution field that are relevant to the question of whether mood is associated with a specific type of attributional behavior. Only three sets of studies filled the necessary requirements: Sullivan and Conway's (1989) studies, Forgas at al.'s (1990) studies, and Curren and Harich's (1993) study. Unfortunately, the findings of those five studies do not seem to

agree. The results of Sullivan and Conway's (1989) two studies suggest that individuals in negative moods make slightly more dispositional (internal) attributions than those in any other mood states[20]. However, both the results of the two studies developed by Forgas and collaborators (1990) and Curren and Harich's (1993) study show a higher association between positive mood and internal attributions.

Despite this lack of consistency in results, these studies might provide a better understanding of the role of capacity and motivational factors in producing the MIPE. Although Sullivan and Conway (1989) presented results that are opposite to Forgas et al.'s, both sets of authors argued that a higher number of dispositional/internal attributions resulted from capacity deficits. However, the former authors interpreted their data as evidence that sad individuals have more capacity deficits than happy individuals, whereas the latter authors interpreted their data as evidence that happy individuals lack capacity to process. Their arguments in favor of a capacity explanation of the MIPE are associated with the lack of any motivational impact on processing. Sullivan and Conway's claim is based on the fact that their sad individuals generated as many responses as non-sad individuals (they "should" have produced fewer causal attributions if less motivated). Forgas et al.'s (1990) claim is based on the fact that whereas sad participants' responses differ in low (other) and in high (self) motivation conditions, happy participants' responses were equal in both conditions.

Unfortunately, there are several reasons why these interpretations might be suspect. Sullivan and Conway's claim regarding non-motivational differences between sad and

---

[20] However, it is not clear what those states are (neutral and/or positive), since positive and neutral mood induction procedures produced similar values on manipulation check items.

happy participants relied on the equal number of attributions they made. In Curren and Harich's study we find exactly the same result: an equal number of reasons was listed by happy and sad participants. However, if this number reflects the degree of individuals' involvement in the situation we should expect it to be influenced by the manipulation of the "importance" of their task, which did not happen. Moreover, since in Sullivan and Conway's study all individuals made more external attributions than internal ones, it seems that the majority of responses were non-dispositional. Since these responses are the ones expected to be the more effortful, it might mean that participants were all highly motivated. The fact that participants in negative moods produced slightly, but significantly, more internal responses than did individuals in any other condition is then not clearly attributable to motivational or capacity factors. Notice that the nature of the majority of responses in Sullivan and Conway's study is also incongruent with the two other sets of studies. In Curren and Harich's (1993) studies all participants made more internal ratings. Similarly in Forgas et al.'s studies all participants made more internal than external responses. The claim that happy individuals made even more of these internal responses because of capacity deficits is also debatable. Forgas' results in the "self condition" parallel Curren and Harich's results (also self related) in the "unimportant condition" and Forgas' results in the "other condition" map on to their results in the "important condition".

On the basis of this evidence, can it be said that positive and non-positive moods induce individuals to engage in different modes of processing information? If non-dispositional attributions require individuals to engage in deeper processing, all Sullivan and Conway's participants were processing deeply. Since all subjects produced non-dispositional inferences as well as dispositional ones, it appears that they all attended the environmental information (which is Gilbert's criterion for inferring more effortful processing). Sad participants, however, produced a slightly higher number of internal attributions. This could mean less elaboration. However, since sad individuals also gave *more diverse responses,* this might suggest that they were processing the information more carefully. In contrast, the majority of participants in Forgas and collaborators' and Curren and Harich's studies were not engaged in such deep processing as they all gave many more "low-effort" responses. Once again, although sad participants made more external attributions, they also gave *more diverse responses.*

What can explain the asymmetry of all these results? One possible reason is the different nature of each experimental task. Sullivan and Conway asked participants to write down the reasons the target acted in a interpersonally positive or negative way. Forgas and his collaborators asked participants to rate how much a success or failure in an exam could be attributed to four different causes: *ability, effort, luck, and situation.* Curren and Harich first asked for a list of reasons for personal success or failure and only then asked participants to rate the locus of causality using 3 nine-point ratings: *reflect on you - reflect on situation; outside of you- inside of you; something about you-something about others.* The differential nature of tasks alone might have induced different levels of engagement in the processing of information. In fact, it can be argued that more effort is necessary to write down an answer than to select one.

In sum, with regard to the attribution field, it seems to be very clear that there are not sufficient data to suggest that mood is preferentially associated with one or another kind of attributional behavior. Without clear evidence of the MIPE, no other questions regarding its characteristics may even be addressed.

Mood and decision making; problem solving; and reasoning

Individuals can made decisions and solve problems by engaging in either a more or a less analytic processing of information. They can solve a problem or make a decision on the basis of a complex process that tries to achieve an optimal solution or on the basis of a more simplified kind of strategy (Simon, 1976). Sloman (1996) also suggests that all reasoning and inference processes can be carried out in either a rule-based, analytical mode or a non-analytical, associative mode. If individuals in neutral moods engage in more analytic processing, they should perform better on tasks which require the use of logical and mathematical rules. If happy individuals engage in less extensive processing of information, they should give more "intuitive" responses, rely more on heuristic processing, and depend more on previously learned answers.

To furnish evidence that particular mood states are associated with particular modes of making decisions, reasoning, and solving problems, some dissociation procedure or measure must be used. Preferably the same experimental task should have different solutions derived from one or the other mode of processing. Alternatively, a task must be clearly associated with one or the other type of processing. Since non-analytic responses are more efficient (if they are available), response latencies also inform about the mode of processing individuals are engaged in. However, for response latency to be informative, it is necessary to be sure that the task is able to be accomplished by a non-analytical processing mode (must be either associated with this mode of processing or be able to be performed in either mode).

Most of the studies developed in these fields have taken as evidence of different processing modes the diversity of strategies used by participants as well as the type of strategy followed. More flexibility of thought is interpreted as an index of higher elaboration and deeper processing. Different modes of processing are also inferred from the accuracy of responses. More correct responses are assumed to indicate more careful processing. It is, however, debatable whether mode of processing should be inferred from a correct or incorrect response to the task. Both heuristic and deeper processing can be associated with both correct and incorrect outputs.

Only a few studies that address the impact of affect on decision making, problem solving, reasoning, and inference processes actually manipulate mood[21]. Table 3.4 summarizes their major features including mood manipulations, designs, procedures, and most relevant results. These results focus on the dependent measures discussed above: type of strategy, flexibility of strategies, correct versus incorrect responses, and latency of response.

---

[21] Several studies suggest that dysphoric individuals have difficulty with complex problem solving tasks because of their "reduced attentional resources". Studies with clinical samples offer more consistent evidence of deficits in the depressed compared with non-clinical samples. Non-clinical depressed individuals' impairment is totally dependent upon the nature of the problem solving task. After reviewing the literature, Hartlage, Alloy, Vasquez and Dykman (1993) conclude that the degree of interference in problem solving is directly related with the severity of depression (p.252).

Table 3.4 : Summary of mood studies developed in problem solving, decision making and reasoning

	Mood induction and check procedures (HM-Happy mood; NM- Neutral mood; SM- Sad mood; CM-Control)	**Design and procedure** (Ss - Subjects)	**Relevant results** (significant: marginal+; p<.05*, p<.01**; p<.005***)
Problem Solving			
Mitchell & Madigan **(1984)** **Exp. 1**	**Induction**: Velten procedure with 50 somatic-statements for HM and SM. Similar non-affective sentences to be read with feeling were constructed for the NM condition. **Check:** After experimental task. With the Multiple Affect Adjective Check List (Zuckerman & Lubin, 1965).	**3 (mood)** **Procedure:** Following the mood inducement, Ss responded to a Means-Ends Problem Solving Test (Platt & Spivack, 1975). Responses were classified as "relevant "or not ("irrelevant" + not-related, no-answer)	*Mood main effect*: SM generated fewer relevant means and more other responses.
Mitchell & Madigan **(1984)** **Exp. 2**	**Induction**: Velten procedure + an explicit demand to be in the right mood: instruction to act as if they were elated (HM) or depressed (SM). **Check:** As Exp. 1.	**2 (mood)** **Procedure:** As Exp. 1.	*(No effects)*
Isen, Daubman, & Nowicki **(1987)** **Exp.1**	**Induction:** Affective stimulus presentation (5m) - humorous film (HM); math film (NM); no film (CM). **Check:** (...)	**4 mood/task (HM difficult, NM difficult, CM difficult, CM easy)** **Procedure:** Ss in all conditions were presented with the "candle task" (Duncker, 1945). In difficult conditions the list of objects had "a box of tacks"; in easy conditions the list had "a box" and "tacks".	*Mood main effect* ** : Ss in HM gave higher number of correct responses than Ss in NM or CM (difficult). HM differed in their strategy: they generated and tested many ideas, rapidly. CM perseverated on one solution.
Isen et al. **(1987)** **Exp. 2**	**Induction:** Affective stimulus presentation (5m) - humorous film (HM1); depressing film (SM); math film (NM) ; no film (CM). Other group received a candy bar (HM2) **Check:** "How the film makes you feel" or "how do you feel". Answered on a 7-point scale (positive-negative). HM1= 3.11; HM2= 2.69; SM= 5.52; NM= 3.90; CM1= 3.18; CM+ arousal = 3.10.	**6 mood/arousal (HM1, HM2, SM, NM, CM1, CM+arousal)** **Procedure:** As in difficult conditions of Exp.1.	*Pairwise comparisons related with Mood main effect*: Ss in the HM1 condition gave a higher number of correct responses than Ss in all other conditions*. Ss in the HM2 did not differ from the other non-happy conditions.

Isen et al. **(1987)** **Exp. 3**	**Induction:** Ss were provided with a candy-bar (HM) or not (CM). **Check:** (...)	**2 (mood) x 3 (level of difficulty of task)** **Procedure:** After mood manipulation, Ss solved 21 items (7 very difficult, 7 moderate difficulty , 7 very easy) selected from the 78 Remote Associates Test items (Mednick et al., 1964).	*Pairwise comparison related with Mood x Difficulty interaction:* HM only differ from CM on the moderate level of difficulty, giving higher number of correct responses* than CM .
Isen et al. **(1987)** **Exp. 4**	**Induction:** Affective stimulus presentation (5 m) - humorous film (HM); no film (CM); no film +arousal (CM2). **Check:** (...)	**3 (Mood/Arousal)** **Procedure:** After mood manipulation Ss solved 7 items of moderate difficulty selected from the 78 Remote Associates Test items (Mednick et al., 1964). As moderate in difficulty items.	*Mood main effect* *: HM Ss gave higher number of correct responses than the two other conditions which did not differ.
Kaufman & Vosburg **(1997)** **Exp. 2**	**Induction**: Affective stimuli presentation (10m) - a humorous film (HM); a depressing film (SM); a nature program (NM); no-film (CM). **Check**: After video. Russel Adjective Check List : (*Mood means not reported*)	**4 (mood)** **Procedure:** After mood checks Ss performed two tasks in random order, with 5 m for each task: Two string problem and the Hatrack problem (Maier, 1970). Ss were asked to press a key of a response box when they started and finished the task, and to write down the solutions of each problem in paper.	*Mood Main effect:* Latency of correct responses was fastest for SM, followed by NM and control condition, and was slowest for HM. *(significance level not reported)*
Decision Making[22]			
Forgas **(1989)**	**Induction:** Bogus feedback on a social adjustment and personality questionnaire. **Check:** Before and after the decision task. On a 7-point happy-sad scale. HM= 2.69; 3.11; NM= 3.31; 3.59 ; SM=4.42 ; 4.03.	**3 (mood) x 2 (personal vs impersonal decision)** **Procedure:** Ss were given personal information about several targets and asked to choose a partner for themselves (personal conditions) or for the next participant in the experience (impersonal condition). They indicated which items they paid attention to and rated their importance.	*Mood Main effects:* HM took less time to reach a decision ** and fewer steps ** than SM or NM. SM were less efficient * than NM or HM. HM uses more elimination by attributes decision strategy ** than SM (NM falling between). *Mood x personal relevance interaction*: Mood had greater effect on decision efficiency ** when making impersonal than personal decisions. HM decision strategy ** is affected by personal relevance, whereas SM and NM are not.

[22] Isen and Means (1987) report a study that has been frequently cited in this literature. The fact that the authors did not furnish all the details necessary for a critical analysis of their results prevents me from including it in this analysis.

Forgas (1991) Exp. 2	**Induction:** Bogus feedback on the performance of a social adjustment and personality questionnaire. **Check:** After the decision task. On three 7-point scales (happy-sad; good-bad; satisfied-dissatisfied). HM= 2.74;NM= 3.69; SM=4.49.	**3(mood) x 2 (personal vs impersonal decision)** **Procedure:** Same as Forgas, 1989	*Mood Main effects:* HM took less time to reach a decision ** and fewer steps ** than SM or NM. SM constructed global impressions whereas HM and NM used comparison by features decision strategy **. *Mood x personal relevance interaction*: Mood had greater effect on decision efficiency ** when making impersonal than personal decisions. High personal relevance increased the use of global impressions ** more in the SM:
Forgas (1991) Exp. 3	**Induction:** Affective stimuli presentation - humorous film (HM); depressing film (SM); lecture on art film (NM) **Check:** After mood inducement. On three 7-point scales (happy-sad; good-bad; satisfied-dissatisfied). HM= 3.04; NM=3.71; SM= 4.29.	**3(mood) x 2 (personal vs impersonal decision)** **Procedure:** Same as Exp. 2 but target information was presented on a computer screen.	*Mood Main effects:* HM took less time to reach a decision * and took fewer steps * than SM or NM. SM were less efficient * than NM or HM. SM constructed global impressions whereas HM and NM used comparison by features decision strategy **. *Mood x personal relevance interaction*: HM reached a decision faster * and dealt faster * with information in the impersonal condition than in the personal condition. High personal relevance increased the use of global impressions ** more in SM.
Reasoning			
Melton (1995)	**Induction**: Affective stimulus presentation - a humorous cartoon or a comedian tape (HM) ; or no manipulation (CM). **Check:** After film. Composite score of 4 adjectives (Positive Aff. factor: happy, cheerful, delighted, excited) belonging to a 14 adjective scale, associated with 5 point scales describing how they feel in the present moment (1-not at all; 5-very strongly). HM=33.1; 32.9; CM= 28.3	**2 (mood)** **Procedure:** After mood induction and check, Ss solved, in random order, two types of problems: a set of Remote Associations items and 10 syllogisms. Ss were invited to draw a diagram if they felt necessary. Time and type of answer were collected.	*Mood main effects:* CM performed better** on the syllogisms than HM. HM selected unqualified universal conclusions * more often. HM used heuristic strategy + more. Fewer HM drew a diagram + HM spent less time + on the syllogism task. (*No effect of mood on the associative items.*)
Palfai & Salovey (1993)	**Induction**: Before each problem task. Affective stimulus presentation (6-10m) - a humorous film (HM); a depressing film (SM); film with no specific valence (NM). **Check**: After each film. Composite score of five 6-point scales (sad; happy, disappointed, content, exhilarated, satisfied): HM=32.96; 31.66; NM=22.25; 22.07 ; SM=13.35; 13.35	**3 (mood) x 2 (deductive and analogy tasks)** **Procedure**: After mood induction and check, Ss solved two sets of problem tasks (10 deduction or 10 analogy problems) mediated by a re-manipulation and check of mood. Latencies and responses were assessed.	*Mood Main effect:* HM and SM response latencies** were higher than NM . *Mood x Task interaction *:* Both SM and NM response latencies were lower* than HM in the deductive task. Positive trend* of NM, HM and SM response latencies in the analogies task. *(No effects on number of problems solved correctly).*

Oaksford, Morris, Grainger, & Williams **(1996)** **Exp. 1**	**Induction**: Affective stimuli presentation (7m) - a humorous film (HM); a depressing film (SM); a nature program (NM); no-film (CM). **Check**: After video. Composite score of five 9-point scales (refreshed-tired; calm-anxious; alert-unaware; positive-negative; amused-sober): HM=2.38; NM=2.78 ; SM=3.96; Control=3.24	**4 (mood)** **Procedure:** After mood checks Ss performed a non-rational version of the Immigration Task (Cheng & Holyoak, 1985) - a *deontic* version of Wason (1968) selection task.	*Mood effect* * : Mood conditions differ in the distribution of type of response used most. Both SM and HM were confirmers rather than falsifiers; the opposite was true for NM and Control conditions.
Oaksford et al. **(1996)** **Exp. 3**	**Induction:** Affective stimuli presentation (7m) plus giving Ss the goal of achieving a mood state - a humorous film (HM); a depressing film (SM); a nature program (NM); no film (CM). **Check**: Before and after video. Post video: (the composite score of five 9-point scales used in Exp. 1): HM=2.26; NM=3.27; SM=4.08; Control=4.12	**4 (mood)** **Procedure:** After mood checks Ss performed a Tower of London task (Shallice, 1982)	*Mood effect.* HM took more moves to solve the problem and spent less time to plan their moves than other conditions.

The research presented in Table 3.4 suggests that mood does influence how individuals make decisions, solve problems, and reason. The data suggest that those who feel good tend to simplify decisions and problem solving, use more heuristic strategies, and take more time to solve more analytical tasks. Before assessing whether this set of studies can help clarify the MIPE and its characteristics, let us first ask if these studies actually provide evidence of a MIPE.

Forgas claims to have demonstrated a MIPE in decision making. He bases his claim on several points. First, individuals in positive moods are faster in dealing with information and making decisions than individuals in neutral and negative moods. In addition, personal relevance, like other involvement/motivation manipulations, interacts with mood manipulations. Mood effects on decision latencies are more evident in low relevance situations than in high relevance situations. These results are compatible with those obtained in the persuasion literature, suggesting that high motivation in some way overrides "deficits" associated with positive mood (Bless et al., 1990). With high personal involvement, happy individuals' decision latencies are the same as those of non happy individuals. Whereas involvement impacts on the decisional strategies of happy individuals, it does not affect the decisional strategy used by non happy individuals (Forgas, 1989, 1991, Exp.2). Finally, happy individuals tend to use different decisional strategies than do sad individuals. Happy individuals' strategies encompass the comparison of features whereas sad individuals rely more on global impressions. The nature of these strategies can be argue to be inconsistent with what would be expected by the MIPE. But as Forgas (1991, p.715) notes "...both the impression formation and the comparison by features strategies are compatible with detailed, systematic, or simplified heuristic processing". Thus, in general, Forgas' studies furnish evidence to support the MIPE: in contrast to non-happy individuals, happy individuals engage in non-analytic processing.

All the studies in the reasoning field also seem to suggest a MIPE, with the pattern that has been identified in other domains. Melton's (1995) results clearly support this conclusion. His experimental tasks were syllogisms. Syllogisms are deductive arguments whose solutions are achieved through analytic, rule-based processing. However, a solution (not always the correct one) may be achieved on the basis of less elaborative processing. Melton's tasks allow such shortcuts, enabling individuals who feel good to use them more. Since the heuristic answer could be dissociated from the logical one, it was clear why individuals took more or less time to respond. Palfai and Salovey's (1993) study associated the two processing modes with performance in two different tasks. Latency of responses was the single significant dependent variable. Since happy individuals took longer to solve "deductive problems," results were consistent with the idea that they had "problems" engaging in more analytic rule-based processing. Oaksford et al.'s (1996) results are, however, less clear. In their first study using a *deontic* version of the analytic Wason (1966) four-card-selection-task[23] they found no evidence of a MIPE: Both sad and happy individuals behaved similarly in using more non-logical strategies. Some support for the MIPE and its pattern is offered, however, by the results of their third experiment. In this experiment, only happy individuals performed differently from the control groups, exhibiting less analytic behavior (less advance planning, and more trial and error).

Evidence from the problem-solving studies does not seem to help clarify the MIPE. Isen's studies suggest that happy individuals react to decisional and problem solving situations differently from those who are not in positive moods. According to Isen, happy participants make quicker decisions without sacrificing efficiency. Instead of being merely impulsive and careless, happy individuals adopted an "elimination by aspects" decision strategy and quickly eliminated less relevant dimensions, reaching the same or better decisions than those in neutral or negative moods. These results are interpreted as evidence against the idea that happy individuals lack capacity to do deeper processing. Positive mood improves performance on tasks usually considered very difficult and demanding of capacity, mainly because it improves creativity (Isen et al., 1987, p. 1130).

The relevant question here, is, however, if the pattern of behavior shown by happy people in these studies is or is not related to a non-analytic processing of information.

---

[23] *Deontic rules* are "moral obligations" and "right actions," such as those associated with permission, promise, obligations, or warnings. Although the original Wason task requires logical rules (and thus a rule-based analytic process) the special context added to the task might activate a "mental schema" that could facilitate non-analytic processing (Johnson-Laird, Legrenzi, & Legrenzi, 1972). This question is not taken in consideration in Oaksford et al.'s (1996) study.

First, it is worth noting that success on a difficult task does not necessarily depend on analytic processing. Such tasks may also have less capacity demanding solutions. In this case, the task could be completed more quickly if individuals engaged in non-analytic processing than in analytic processing (see E. R. Smith & DeCoster, in press, for a similar argument on other topics). If this is the case, better performance on such "a demanding task" under positive mood is informative of processing mode only if such efficient solutions are available. Since no such information is given in these studies, a conclusion that happy individuals may "perform better" is not by itself informative of the characteristics of the MIPE. Second, Isen and her colleagues (1987) interprete their data as supporting the idea that positive mood facilitates "divergent thinking"[24] and thus facilitates performance on "creative problem-solving tasks". Similarly, Mitchell and Madigan's (1984) and Kaufman and Vosburg's (1997) results regarding happy participants' "greater efficiency" are also interpreted as a result of creativity.

In order for these studies to be relevant to elucidating the MIPE it would be important to know how this "creativity" is related to modes of processing. This is, however, a point that still needs clarifying. Since non-analytic processing is defined as essentially a reproductive processing mode whereas analytic processing is productive, it is tempting is to equate creativity with analytic processing. However, the creative moment is usually defined as an intuitive moment, a moment where for no special reason the "right" answer pops to mind. This description of creativity better fits non-analytic processing. It may thus be that creativity is the reproduction of an established "answer" in a totally different context. That is, it involves a kind of flexibility of thought that

---

[24] Divergent thinking refers to the ability to think about diverse valuable alternatives in novel situations. It contrasts with convergent thinking which refers to a thinking of a deductive kind in which there is a single appropriate answer (Guilford, 1961).

should not be equated with a deep search down a logical pathway for a new answer, such as characterizes the productivity of analytic processing.

Together these two points suggest that much more work must be done before we understand how such "creativity studies" inform us about the MIPE and its nature.

In sum, Table 3.4 provides evidence for the MIPE , most clearly in the studies of reasoning. Happy individuals engage in non-analytic processing by using more heuristic strategies, solving analogy compared to deductive problems faster, elaborating the information they receive less deeply (spending less time in planning their action) and always reacting more quickly in general. The decision making studies can be said to support only the idea that happy individuals react more quickly to the decisional situation. Studies developed in the problem solving field, although suggesting the existence of a MIPE, are inconclusive regarding its actual pattern. Their results will only be fully understood when the relation between their manipulations and dependent measures more diagnostic of dual processing modes is more clearly defined.

Apart from corroborating the MIPE in a different context, and suggesting that motivational factors may indeed moderate these effects (Forgas, 1991), these studies do not provide much additional information that helps clarify the MIPE

Mood and perception of people and behavior

Person perception studies address the questions of how information about persons is encoded, represented, and recalled in memory as well as how that information impacts on evaluations. A dual process approach would suggest that this information may be either carefully attended in all its details or more quickly considered with reference to some general and previously stored structure. The typical procedure in these studies is to provide individuals with short behavior descriptions and ask them to form an impression of the person described and then report it on one or more evaluative/descriptive dimensions. Individuals may also instead be asked to remember as many of the descriptive sentences as possible, allowing the impact of impression and memory goals on how information is recalled to be compared. For our purposes it is relevant to considered whether these dependent variables are diagnostic of whether information was processed analytically or non-analytically. Non-analytic evaluations of a person are expected to differ from analytic ones in latency. Evaluations that result from a deep and careful analysis of received information will take longer than those relying on less analytic processing. Recall of information that was analytically processed may differ in efficiency and organization from information that was processed non-analytically. Why this might be so is not clear, however. Higher clustering (organization) may result from either simplified, non-analytic processing or more elaborate, analytic processing (Bless, Hamilton, et al., 1992). Thus, happy people are expected to evaluate others more quickly (process non-analytically) than non-happy people who is expected to attend to more details of that information (process analytically). However, there is not clear how these different mood states may impact the degree of organization of recall.

How individuals perceive behavior might also be informative about how they process information. Within the field of behavior perception Lassiter, Koenig, and Apple

(1996) manipulate mood within the experimental paradigm developed by Newtson (1973). Newtson considered that perceivers divide others' behavior into units of meaningful actions and thus developed an experimental paradigm in which he asked participants to press a button whenever they detected a meaningful action in a presented sequence of behaviors. Lassiter and collegues (1996) postulate a behavior perception continuum on which there is gross or global level of unitization at the low-effort end and a fine-grained or detail-oriented level of unitization at the high-effort end. Thus unitization rates may in some way be diagnostic of dual processes. Analytic processing of information would then be expected to induce more detailed -oriented processing and thus a higher number of perceived behavior units. Non-analytic processing would favor perceptions of more global units of behavior. Corroborating this idea, unfamiliar behavior sequences tend to be unitized at a finer level and familiar behaviors at a grosser level (Newtson, 1973; Wilder, 1978). Markus, J. Smith, & Moreland (1985) found that perceivers unitized behaviors into fewer units if they possessed a relevant self-schema. Individuals who lacked such a schema had to employ a higher rate of unitization. Motivation seems to affect unitization levels, with highly motivated individuals unitizing more finely (J. A. Russel, 1979; Hogue & Atkinson, 1989).

Organizing studies by their focus on person or behavior perception, Table 3.5 summarizes their relevant features and significant results.

Table 3.5 : Summary of mood studies developed in person and behavior perception

	Mood induction and check procedures (HM-Happy mood; NM- Neutral mood; SM- Sad mood; CM-Control)	**Design and procedure** (Ss - Subjects)	**Relevant results** (significant: marginal+ ; p<.05*, p<.01**; p<.005***)
Person perception.			
Forgas & Bower (1987)	**Induction**: Feedback - positive (HM) or negative detailed feedback (SM) about Ss performance on a social adjustment and personality bogus test. **Check**: 9-point happy-sad scales presented on 3 occasions during the procedure.	**2 (mood) x 2 (positive vs negative target attributes)** **Procedure:** Ss read descriptions of persons containing positive and negative details presented on a computer screen with an impression formation goal .	*Mood Main effect* ** : HM took less time to read person descriptions than SM. HM took less time to make judgments than SM *Mood x Attributes interaction* ** : HM Ss contrary to SM Ss take less time to make positive judgments and more time to make negative judgments.
Bless, Hamilton, & Mackie (1992)	**Induction**: Affective stimuli presentation (4m) - humorous film (HM); depressing film (SM); wine cooking film (NM). **Check**: After video, Ss were asked to rated "how do you feel now" on a 9-point scale (sad-happy): HM=6.77; NM=5.72 ; SM=3.90.	**3 (mood) x 2 (impression vs memory) x 2 (positive vs negative behaviors descriptions)** **Procedure:** Ss read 28 descriptions of positive and negative behaviors of four trait categories, with an impression formation or memory goal. A 3m filler task was then presented to dissipate mood differences (after which mood was checked again) and recall measures were collected.	*Mood x Instruction set interaction* * : HM show higher levels of clustering and SM lower levels in both impression formation and memory goal set. NM Ss in both sets of instructions showed: higher clustering in the impression formation than in the memory condition.
Behavior perception.			
Lassiter, Koenig, & Apple (1996) Exp. 2	**Induction**: Velten procedure (60-self reference mood statements). **Check**: Following manipulation. With Multiple Affect Adjective Check List. HM= -10.11; SM= 64.17 (Higher numbers reflect higher dysphoria)	**2 (mood)**[25] **Procedure:** After mood induction and measurement, Ss viewed one of two short video-tapes of a woman working in an office setting and pressed a button when judging that a meaningful action ends and another begins.	*Planned contrast* * : HM Ss pressed more frequently than SM Ss, who thus had lower unitization rates.

[25] Control of effectiveness of mood effects are not considered in this presentation.

Lassiter, Koenig, & Apple **(1996)** **Exp. 3**	**Induction**: Velten procedure (60- self reference mood statements). **Check**: Following manipulation. With Multiple Affect Adjective Check List. HM= -17.28; NM= 1.95 SM= 53.31 (Higher numbers reflect higher dysphoria)	**3 (mood) x 2 (need for cognition)** **Procedure:** After mood induction and measurement, Ss answered an 18-item scale of need for cognition. Then Ss viewed a short video-tape of a woman in her apartment and pressed a button to indicate beginning and end of a meaningful action.	*Main effect of Need for cognition* *** : Ss low in need for cognition discriminated fewer meaningful units (actions). *Planned contrast related with Mood main effect* - HM Ss pressed more frequently than SM Ss, who this had lower unitization rates.

Mood states do seem to impact the process by which people are perceived and judged. Individuals in positive moods produce quicker evaluations of others (Forgas & Bower, 1987) and see information as more related and organized than non-happy individuals (Bless, Hamilton et al., 1992). These findings are consistent with the idea that positive mood is associated with particular ways of dealing with information (and thus with a MIPE). The results thus seem compatible with the idea that happy individuals tend to engage in non-analytic processing, since they engage in a processing mode that provides quicker outputs and is sensitive to previously activated information. In addition, the evidence suggests that by influencing how information is processed, mood also influences how information is organized. A better and clearer understanding of how processing and memory organization are related is, however, necessary for these studies to contribute much more to our understanding of the MIPE.

The person perception studies reviewed in Table 3.5 address two topics of interest to the MIPE: the impact of valence of information and the role of processing goals.

Is the MIPE affected by the nature of information processed? In Forgas and Bower's (1987) study valence was shown to impact analytic and non-analytic judgments differently. Since congruence effects were mainly found in positive mood conditions, it seems that valence has greater impact in superficial processing than if the information is carefully analyzed. One possibility is that happy individuals base their judgments more on the specific features of provided information than do individuals in sad or neutral moods. This would suggest that they engage in a more detailed-oriented processing mode, paying attention to details of the stimulus. However, and more in keeping with other data, it is also possible that happy individuals merely rely on only one detail of the information: its valence. The use of a heuristic such as " what is good is good and what is bad is bad" would produce results more dependent on stimulus valence than if individuals attended to other characteristics of the data.

Is the MIPE moderated by processing goals? Processing goals were previously seen to impact processing and thus to possibly moderate the MIPE. However, in Bless, Hamilton, et al.'s (1992) study only participants in neutral moods were sensitive to the processing goal manipulation (organizing information more with an impression formation goal than with a memory goal). Regardless of the processing goal, happy participants' recall performance and recall clustering was as good as that of participants in neutral moods with an impression formation goal. Regardless of processing goal, unhappy participants recalled as much as those in positive moods. However their clustering scores were, with both processing goals, lower than those of happy participants. These results seem to suggest that the impact of goals on processing can be overridden by the impact of mood on processing. Research comparing impression and memory goals has found that subjects forming an impression have better recall than those with a memory goal and that this effect is mediated by the different levels of clustering elicited by those processing objectives(e.g. Hamilton, 1981). However a memory goal does not seem to be able to overcome the tendency of happy individuals to process received information more globally. If processing goals can in fact moderate the impact of mood on processing, they are not all equally effective in doing so.

The two behavior perception studies[26] presented in Table 3.5. suggest that positive mood is associated with non-analytic processing. If we attend to the continuum of unitization postulated by Lassiter et al. (1996), we would have to conclude from their studies that positive mood induces deeper processing of behavioral information. In fact happy participants seem to perform identically to high-need-for-cognition participants. Thus, these results are the opposite of those obtained in most of the other studies. Why might this be so? One possibility is performance on the unitizing task is unrelated to modes of information processing. This could happen for at least two reasons. Higher clustering of behavior into significant units may signal both more and less integrative processing. The goal of clustering units of behavior into a meaningful unit in and of itself may induce analytic processing, making the impact of mood on processing unrelated to processing mode. In this case the impact of motivation on processing would signal only the different levels of attention given to informational detail and not real differences in

[26] Lassiter et al. (1996) reported three more studies in which the influence of mood on unitization rate was also assessed. Those studies are not reported here because mood was not manipulated. Naturally occurring dysphory was also shown to induce less effort in unitizing other's behavior (Exp.1). However, when directly instructed to use a more effortful strategy (Exp.4) or when behavior sequences where positive rather than neutral or negative (Exp.5), dysphoric individuals unitized as effortfully as non-dysphoric individuals.

processing. Clearer knowledge about this measure of unitization is thus necessary before its implications regarding the MIPE can be understood.

In sum, the studies that assess mood effects in both person and behavior perception offer interesting but inconclusive results. They seem to corroborate the idea that different mood states are associated with different modes of information processing (a MIPE). However, they provide some results that can be understood only after the relation between their manipulations and dependent measures in the context of dual processing approaches is more fully understood. This is work yet to be done.

Summary:

All the studies reviewed here suggest that mood influences the way in which information is processed. The main question to be answered, however, is whether there is a clear association between particular moods and particular modes of processing. Is positive mood associated with associative, non-analytical, more memory-based processing? Is neutral mood associated with rule-based, analytical, detailed-oriented, and more data-driven processing? Where does negative mood stand in regard to these associations? Other relevant and related questions are: When and how does mood have its effect? How do other factors such as awareness of the source of mood state, processing goals, motivation, and capacity influence the relation between mood and processing? How does their influence help us understand why mood affects the processing of information ?

The experience of being happy or not being happy seems to be crucial to whether individuals engage in one information processing mode or the other. In general, the reviewed data suggest that positive mood is more likely to induce a non-analytic, more superficial mode of processing information than is neutral mood. Happy individuals are equally persuaded by strong and weak arguments. They do not scrutinize message arguments carefully. They do not engage in a detailed analysis of message content. Happy people seem to rely on previously-learned associations. Their judgments accommodate the characteristics of presented stimuli to the regularities observed in previous experiences and stored in memory. Happy people rely on well learned and highly structured information, such as stereotypes and scripts, as a basis for their judgments. They are more influenced by information made accessible in memory. Moreover, happy people seem to encode incoming information on the basis of its association with information already stored in memory. Thus, with regard to a positive mood state, we can conclude that there is sufficient evidence that happy people process information in a non-analytic mode. Whenever this mode of processing allows task goals to be achieved, happy people complete tasks quickly and efficiently (and not necessarily, but frequently, accurately). However, if the task or processing goal requires a more analytic processing to achieve an appropriate outcome, happy people's performance can be impaired, either in terms of latency or quality of their responses.

With regard to a non-happy mood states, the evidence points to preferential engagement in an analytical, systematic, elaborative, rule-based mode of information processing. People who are not happy attend to the details of information they receive more carefully. They can use information stored in memory (knowledge) in order to compute judgments but they will not simply use it without further thinking (E. R. Smith & DeCoster, in press). This way of dealing with information is more time and capacityconsuming. From the **27 studies** that explicitly manipulate positive, neutral and negative mood and associated positive mood with non-analytic processing[27], **fifteen studies** suggest that sad people process in the same way as do those in neutral mood (Bless, Mackie et al. 1992, Exp.2 ; Bodenhausen, Kramer, et al. 1994, Exp.1., Exp.2, Exp.3 ; Forgas , 1989, 1992a, 1992b, 1995a -Exp.2; Forgas et al., 1990, Exp.1; Isen et al., 1987, Exp.2; Kuykendall & Keating, 1990; Mitchell & Madigan, 1984; Oaksford et al., 1996, Exp.2; Palfai & Salovey, 1993; Stroessner & Mackie, 1992, Exp.2). **Seven studies**[28] presente data in which the responses of those in neutral mood measures fall in between responses of those in positive and negative mood states (Bless, Hamilton et al., 1992; Bless & Fiedler, 1995, Exp.1; Bless, Schwarz et al., 1996, Exp.1; Bless, Clore et al., 1996, Exp.2; Kaufman & Vosburg, 1997, Exp.2; Sullivan & Conway, 1989, Exp.1, Exp.2). The **three studies** that suggest that sad people's performance may be more similar to that of people in happy mood do not have consistent results either across studies or across dependent measures[29] (Forgas, 1995a, Exp.4; Oaksford et al., 1996, Exp.1; Stroessner & Mackie, 1992, Exp.1). Only **one study** show neutral mood performance to be more similar to positive mood performance (Mitchell & Madigan,

---

[27] Since it does not associated positive mood with non-analytic processing, although it included a manipulation of three levels of mood, Lassiter and colleagues' (1996) third experiment is not included in these analyses.

[28] Forgas, 1991, suggests that individuals in neutral mood process information differently from both happy and sad individuals. However, the performance of neutral individuals is more similar to that of happy individuals on some dependent measures and more like that of sad individuals on others. Although this could be interpreted as neutral performances falling between performances of the other two conditions, the data are far from clear. Because of this these studies are not classified in either of these categories.

[29] It seems then that the frequently cited " lack of agreement" in the experimental literature regarding the association of negative mood with a specific mode of processing comes from studies that either do not explicitly manipulate mood or that cannot clearly associate mode of processing with performance.

1984, Exp.1). The reviewed studies seem thus to confirm the MIPE, with a positive mood state being associated with non-analytic processing and lack of positivity in mood being associated with analytic processing.

What do these studies reveal about the mechanism that underlies the MIPE?

First, this mechanism is sensitive to context. The effect of mood on information processing mode seems to be moderated by the nature of the task and of the processing goals associated with it. It is not very clear yet how all of the tasks used in the studies reported relate to each mode of information processing. However, it is obvious that some tasks can only be completed by engagement in more careful and analytical processing, whereas others can be completed via some kind of shortcut. Only in this latter case can there be differences induced by different mood states. Processing goals can also define what the "characteristics of the stimulus" are. Fewer attentional resources are spent on processing the stimulus context than on processing stimulus features. Thus, tasks that demand scrutiny of presented information are more likely to induce careful evaluation of that information, regardless of mood state. In contrast, tasks that focus attention on peripheral characteristics are less likely to induce systematic processing.

Second, the mechanism may act at encoding as well as at retrieval of information. Two studies provide initial evidence about the temporal impact of the mechanism on processing. Bless, Clore et al. (1996) suggest that the mechanism acts both at encoding and at retrieval, at least with regard to a memory retrieval task. Judgmental tasks may be different, however. Since evaluation is frequently spontaneous, it would not be surprising if individuals formed judgments as they encoded relevant information. If mood is not present at that time, there will be no difference in how information is dealt with. The presence of mood differences at retrieval of that judgment will not change the nature and characteristic of the judgment and so no mood influence is detected. This may be why Bless, Mackie, et al.(1992) found mood effects only at encoding, when individuals had a impression formation goal. Thus, although these studies may help to understand when the mechanism responsible for the MIPE acts, they are not definitive about it.

Third, the review suggests that the mechanism responsible for the MIPE may involve a (mis)attribution, process (Sinclair, et al., 1994). This conclusion depends on the finding that when the source of mood is made clear, the MIPE is eliminated. However since only one study clearly suggests this relation of the mechanism with a mis-attribution this characteristic also needs more attention in future studies.

Finally, and most important, these studies are informative regarding the role of capacity and motivation in the MIPE. Both motivational and cognitive factors are known to influence information processing (see, for example, Tesser & Shaffer, 1990, for a review). Capacity as well as motivation is required for analytic processing. The intrinsic relationship of these factors to the definition of the processing modes makes them primary contributors to engagement in different processing modes. It is because of this that the majority of the theoretical explanations of the MIPE (see Chapter I) consider mood effects to be mediated by at least one of these factors. The evidence reviewed has been claimed as support for the mediation of either capacity or motivation. However, no data reviewed here clearly support such a hypothesis. Mackie and Worth (1989), manipulating mood and capacity, show that capacity is more crucial for happy individuals than for non-happy individuals to engage in analytic processing. Bless et al.(1990), manipulating mood and motivation, show that motivated happy individuals can process information more deeply. However, both these manipulations of both capacity and motivation have been criticized as lacking discriminant reliability. Adding more controversy to this discussion, Batra and Stayman (1990) show that need-for-cognition (an individual motivation variable that is known to affect processing) did not qualify the MIPE, whereas Bodenhausen and collaborators (1994, Exp.4) show that manipulation of motivation did qualify the effect. In addition to all these conflicting results, the fact is that none of these studies really tests the mediational assumption. That is, the claimed mediational variables were never measured and then partialed out of the relation between mood and mode of processing. It is thus clear that the reviewed studies do not provide compelling evidence to assume that mood effects are necessarily mediated either by motivational or capacity factors. Moreover, since evidence provided by Bless and collaborators (Bless, Clore et al., 1996; Bless, Schwarz et al., 1996) suggest that the MIPE might very well be a direct effect, capacity and motivation influences on the MIPE are likely to have only a moderation status.

Mood processing effects and he viability of mood as a regulation mechanism.

One of the aims of this review is to assess the viability of mood as a kind of regulation mechanism that was discussed in Chapter II. Several conclusions from the review suggest that mood is a viable regulation mechanism.

First, mood has a systematic and direct relation with information processing mode. Feelings positive engages individuals in non-analytic processing and lack of positivity engages individuals in more analytic processing. Neither motivational not capacity factors seem to mediate this effect, although they can moderate it.

Second, this close relation between mood and mode of processing seems to be sensitive to some specific aspects of the context, as a regulatory process is expected to be. Finally, the fact that the process by which mood manipulations impact on processing might involve a "misattribution" (as suggested by Sinclair et al., 1994) is also relevant for the regulation hypothesis. It corroborates the idea that the reason why different manipulations of affect influence processing is not because they induce such feelings but because those feelings can be confounded with a feeling that arises from another source. Conscious awareness of that other source prevents such a confounding, and eliminates the MIPE.

Conclusion

The goal of this chapter was to clarify the meaning of the concept of mood and its effects on information processing. It thus addressed different theoretical approaches to the concept of mood, and systematically described the fundamental features that seem to distinguish mood. These features seem to corroborate the idea that mood can function as a regulation mechanism. Mood functions constantly in the background of information processing (without disturbing it) and changes easily in valence and intensity in the face of different circumstances. The empirical evidence regarding the impact of mood on processing mode selection in a number of different fields was also fully reviewed in this chapter, helping to define the specific features that characterize the relation between mood and processing mode. The relation between mood and processing mode seems also to be suited to the functions of a regulation mechanism: mood has a systematic direct, and context-sensitive relationships with processing mode activation. Moreover, the impact of mood on processing seems to arise from a confounding of this affect with some more natural process of regulation.

The reviewed studies also helped define some of the aspects of the relations between mood and processing that must be accounted for by a model that seeks to explain the MIPE. These include the fact that the MIPE seems to be a direct effect, which is moderated by motivational and capacity factors; that positive mood is associated with non-analytic processing whereas non-positive mood is associated with analytic processing; that mood effects on judgment occur essential at encoding, although mood also impacts memory retrieval processes; and that awareness of the true source of mood seems to disrupt its impact on processing.

CHAPTER IV:

The "mind needs a heart"

The hypothesis of mood-as-regulation-mechanism

Several conclusions can be drawn from the previous chapters. First, the human mind is dualistic in the sense that there are two alternative modes by which individuals can make decisions or judgments. In one mode (the *analytic* mode), individuals attend to the particulars of a situation and analyze them carefully and systematically. It is thus a consciously controlled, slow, and effortful process. In contrast, the alternate mode (the *non-analytic* mode) is characterized by automatic access to knowledge previously associated with the stimuli on which attention is focused. It is a reproductive, top-down process that is quick, implacable, and not necessary under conscious control (see Chapter II). Second, several theories assume that what regulates these two modes of processing activation is a "feeling" (see Chapter II). Third, mood is able to function as such a regulation mechanism since it is an internal variable that cannot be turned off and that is sensitive to relevant environmental variations (see Chapter III). Fourth, in several fields of research, particular moods have been shown to be consistently related to particular modes of information processing. Positive feelings induce a non-analytic mode of processing whereas non-positivity of feelings induce analytic processing (see Chapter III). This mood affect on how information is processed is referred to as the Mood Information Processing Effect (MIPE; see Chapter I and Chapter III). Finally, several alternative explanations of the MIPE have been offered. All them conceptualize mood as a variable external to the information processing process and most of them consider the effect of mood to be mediated by either motivational and/or capacity factors (see Chapter I). However, there is no clear evidence for a necessary mediation of the MIPE by either capacity or motivational factors (see Chapter III). To the contrary, some evidence suggests that mood influences how information is processed directly (Bless, Clore, Schwarz, Golisano, Rabe, & Wolk, 1996).

All these points represent a favorable context for the mood-as-regulation-mechanism hypothesis. In this chapter, this hypothesis is made more explicit by summarizing its assumptions and its predictions. The first section defines the information processing assumptions underlying the mood-as-regulation-mechanism hypothesis and discusses in detail the implications of the assumed regulation mechanism. The second section defines the unique features of the mood-as-regulation-mechanism hypothesis and its implications, reporting empirical approaches that may support these assumptions. The final section systematizes and summarizes the general predictions derived from these assumptions.

Mood-as-regulation-mechanism hypothesis: Background or foundational assumptions

Most previously offered explanations of the mood and processing effect conceptualize mood as a variable external to information processing system. The mood-as-regulation-mechanism hypothesis states that mood is not only integral to information processing, but that it regulates information processing. It assumes that information processing requires regulation because it subscribes to the existence of two different alternative computation modes.

Three assumptions asserted and defended in Chapter II are the basic foundations of the mood-as-regulation-mechanism hypothesis.

1. *Information processing can be accomplished by two distinct alternative and independently activated modes of computation.*

2. *The existence of two alternative independently activated computational modes requires a regulation mechanism.*

3. *The regulation mechanism is a feeling that signals a match between input and mental representation.*

1. Two independent modes of processing

The first assumption of the mood-as-regulation-mechanism hypothesis is that information processing can be accomplished by two distinct alternative and independently activated modes of computation.

The two alternative computation modes that define information processing have distinct natures. *Non-analytic* processing operates outside of conscious control, with individuals being generally aware only of the results of such processing. It generates responses that are influenced by contextual cues that activate simple heuristics or "feelings" regarding the stimuli. It translates personal experience with the world, such that learning is governed by principles of association, similarity, and contiguity. The non-analytic process is thus basically a top-down, automatic, uncontrollable, reproductive, and fast mode of processing. It can be inferred to govern processes that are implicitly influenced by memory. Examples of such processes are judgments that reflect either the use of more complex memory structures such as stereotypes, object schemas, heuristics, and established attitudes, or the use of a simple memory trace (priming and repetition effects). In contrast, the *analytic process* encompasses careful attention to the specifics of the situation together with the explicit use of a criterion or rule to make judgments. Memory is explicitly used since it allows access to information relevant for processing, that is, representations of the stimuli and of the necessary symbolic rules (which tend to obey logical principles). Consequently this analytic process is controllable, productive, deliberative, and relatively slow.

With regard to the relationship between processes, the mood-as-regulation-mechanism considers that both systems can be simultaneously activated (ruling out a mutually exclusive relation). Some evidence supports this assumption. For example, individuals' responses can incorporate elements associated with both modes of processing and responses can be differently affected by manipulations of capacity or motivational factors (e.g. Chaiken & Maheswaran, 1992; Jacoby, 1991; Jacoby & C. M. Kelley, 1990; Jacoby, Woloshyn, & C. M. Kelley, 1989; Maheswaran & Chaiken, 1991). However, to assume that simultaneous activation can occur, not mean that it must occur. One process might precede the other. However, given the automatic nature of non-analytic processing, it is very unlikely that analytic processing would ever precede non-analytic processing. In contrast, it is highly likely that non-analytic processing would precede activation of analytic processing.

The way the mood-as-regulation-mechanism hypothesis understands the relation between the two processes could thus be considered to define a relation of "redundance" (see Chapter II). An assumption of redundance, however, implies that analytic processing is activated as a continuation of non-analytic processing, when some "threshold" is reached. Information relevant to this threshold arises from the initial process itself. The mood-as-regulation-mechanism hypothesis does not consider the activation of one process to be directly dependent upon the output of the other process, but instead as *independent*. In this view, the "decision" regarding activation or non-activation comes from a third factor, a factor that is sensitive to how "appropriate" non-analytic processing is for that situation.

2. A need for regulation

> The second foundational assumption of the mood-as-regulation-mechanism hypothesis is that the existence of two alternative independently activated computational modes requires an assumption of a regulation mechanism.

What regulates processing mode activation? How does the processor 'know' which mode of processing is appropriate in any given situation (Sherman, 1987; E.R. Smith, 1994)? As asserted and defended in Chapter II, the mood-as-regulation-mechanism hypothesis sees the question of regulation as going beyond natural selection. Instead of assuming that the emergence of one or the other mode of processing is related with mere contextual constraints, the hypothesis considers that the existence of two independently activated processing modes imposes the need for a triggering selection mechanism. This mechanism automatically and reflexively selects the appropriate mode with which information is to be processed in a way that may be unrelated to actual contextual constraints. Thus, even in a context favorable to the emergence of deeper systematic processing (such as when individuals have available capacity and the outcome of processing is personally relevant), this mechanism may signal that non-analytic processing is appropriate. It can do so because it has direct access to information about the viability of a simpler but efficient processing mode that can deal with the situation or about the need for activating a proper algorithm and engaging in more analytic processing.

3. The regulation mechanism is a feeling

> The third fundamental assumption of the mood-as-regulation-mechanism hypothesis is that the mechanism of regulation is a feeling that signals a match between input and mental representation.

Consistent with some important dual process theories that include a regulation mechanism, the mood-as-regulation-mechanism hypothesis considers regulation to be controlled by a feeling. This feeling has a role similar to the one that Reder and collaborators assume is played by the "feeling of knowing" (Reder & Ritter, 1992; Schunn, Reder, Nhouyvanisvong, Richards, & Stroffolino, 1997). Individuals' quick judgments about whether they <u>felt</u> they could retrieve an answer to a problem or whether they had to compute it were independent of actually knowing the answer but closely dependent on the familiarity of the situation. Familiar situations gave participants a "feeling" that they "knew" the answer, and thus promoted less effortful, top-down, retrieval strategies. Unfamiliar situations, in contrast, triggered more effortful bottom-up computational strategies. Thus, a "feeling of knowing" caused by familiarity acted as a critical signal to switch the cognitive system between non-analytic and analytic processing modes. The idea that processing is regulated by "implicit awareness of familiarity" is also common to mismatch theory (Johnston & Hawley, 1994). This theory assumes that detailed processing of well-known, frequently encountered, or familiar situations wastes limited capacity that could be invested in other, particularly novel, situations. When stimulus situations match memory representations, initial bottom-up processing occurs with an "ease" or "fluency" that results in an (implicit) feeling of "similarity," "recognition," or "familiarity" (Eich, 1982; Fiske, 1982; Gillund & Siffrin, 1984; Hintzman, 1988; Humphreys, Bain, & Pike, 1989; Jacoby & Dallas, 1981; Murdock, 1982). Whenever familiarity allows, situations are dealt with more efficiency (with fewer resources) by non-analytic processing and bottom-up processing is turned down (although specific goals or tasks may induce more elaborative processing; see also Fiske, 1982, 1988; Fiske & Neuberg, 1990; Fiske & Pavelchak, 1986; Neuberg & Fiske, 1987).

What other evidence suggests that familiarity increases non-analytic processing? The idea that familiarity promotes non-analytic processing may find empirical support in studies with closely related concepts. For example, both the frequency and recency of memory trace activation increases the likelihood of top-down processing (e.g., Fazio, Powell, & Herr, 1983; Higgins, Bargh, & Lombardi, 1985; Sherman, Mackie, & Driscoll, 1990; E.R. Smith & Branscombe, 1987; Srull & Wyer, 1979). Top-down priming effects have also been shown to depend on the degree of similarity between prime and probe - that is, their degree of match (E.R. Smith & Branscombe, 1987; E.R. Smith, Branscombe, & Bormann, 1988; E.R. Smith, Stewart, & Buttram, 1992).

In addition, evidence associated with the impact of general knowledge structures in processing may also be claimed in favor of this point of view. If familiarity promotes non-analytic processing, tasks that require top-down processing should be facilitated by familiarity whereas output that demands bottom-up processing should be inhibited by it. Although not all information to which individuals have been previously exposed is well structured, information that is represented in memory with a high level of organization is certainly familiar. As noted in Chapter III, these well-structured representations are referred to as knowledge structures or "schemas" (e.g., M. B. Brewer 1988; Brunner, 1957/73; Fiske & Neuberg , 1990; Schank & Abelson, 1977). Natural scenes, scripts, stereotypes, and other "schemas" in memory are automatically activated by focal stimulus information. The match between the two sets of information seems to be a necessary and sometimes sufficient condition for the schema activated in memory to guide further processing (reducing bottom-up processing). The feeling of familiarity associated with this match enhances top-down and inhibits bottom-up processing (Johnston & Hawley, 1994). Several pieces of evidence suggest that to process reality using an established general knowledge structure facilitates apprehension of the gist of the situation but inhibits memory for its details (see e.g. Grasser, 1981; Schank & Abelson, 1977; von Hippel, Jonides, Hilton, & Sowmya, 1993).

Studies in anomaly detection also suggest the inhibition of bottom-up processing in familiar contexts (e.g., Barton & Sanford, 1993; Erickson & Mattson, 1981). In fact, the probability of detecting an anomaly depends on the semantic similarity between the stimuli and its memory representation. The higher the similarity, the lower the detection rate (Barton & Sanford, 1993). Various other lines of evidence converge on the conclusion that familiarity with the situation engages individuals in a mode of processing that is essentially reproductive and top-down (see Johnston & Hawley, 1994 for a review).

On the other hand, unfamiliar or unexpected inputs seem to enhance bottom-up processing. Evidence for the detail oriented processing of unexpected information comes from diverse areas of research in the cognitive (see Johnston & Hawley, 1994 for a review) and social cognitive literatures (e.g., Bargh & Thein, 1985; Fiske &

Taylor, 1991; Hastie & Kumar, 1979; Higgins & Bargh, 1987; see Stangor & McMillan, 1992, Rojahn & Pettigrew 1992, for a review). Support for the interpretation that incongruency or unexpected information promotes engagement in deeper, more systematic, bottom-up processing can be found in Srull (1981). In this study, enhanced memory for unexpected information was not found when participants had reduced cognitive capacity. Research on the costs and benefits of expertise also offers some instructive findings. Experts are by definition people very familiar with a specific highly related set of information. In the presence of input related to their expertise, they engage in less effortful processing, relying on essentially top-down processing (e.g., Arkes & Freedman, 1984; Chase & Simon, 1973; Egan & Schwartz, 1979; Reder & Anderson, 1980; Schmidt & Boshuizen, 1993). Non-experts, unfamiliar with the same set of information, attend more carefully to all information and engage in bottom-up processing.

The influence of familiarity on how individuals deal with problems and answer questions (Jacoby & C. M. Kelley, 1987; C. M. Kelley & Lindsay, 1993; Needham & Begg, 1991) can also be seen as providing evidence for the impact of familiarity on how information is processed. Familiarity triggers retrieval-based processing of problems rather than computation-based processing (Schunn et al., 1997). Reder and Ritter (1992) developed an experimental paradigm in which participants decided whether to retrieve or to calculate a solution to a problem and found that familiarity was the variable that mediated those decisions. That is, participants were influenced by the number of exposures to the problem. Further, when participants had practiced an arithmetic problem and were presented 24 hours later with similar but different problems (operator-switch problems) they wrongly chose to retrieve the answer instead of computing it.

In sum, the reviewed evidence suggests that there is a FIPE (Familiarity Information Processing Effect): increased familiarity triggers non-analytic processing, whereas lack of familiarity triggers analytic processing.

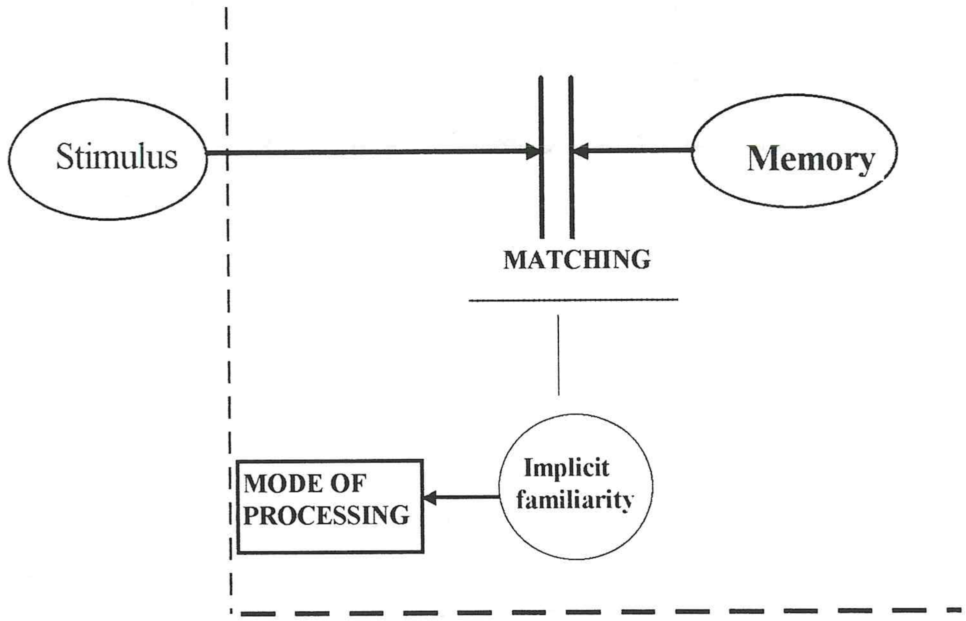
Thus, by assuming information processing as dualistic, the mood-as-regulation-mechanism hypothesis raises the question of regulation and stresses the need to assume a regulation mechanism. This regulation mechanism is assumed to be a feeling that varies continuously in intensity[1] (Yonelinas, 1994), and is associated with the ease or fluency with which the stimulus is processed (Jacoby, 1988; Jacoby & C. M. Kelley, 1990). Fluency arising from a match between input and mental representation is associated with a feeling that the situation can be dealt with on the basis of what is already known[2], and thus that non-analytic processing is appropriate. This feeling, referred to as "implicit familiarity," translates the degree of matching between stimulus and memory information and defines the regulation mechanism. It is this mechanism that informs the system whether to process information analytically or non-analytically.

---

[1] Dissociating the relative contribution of familiarity and recollection on overall recognition performance, Yonelinas (1994) found that as the response criterion was relaxed the probability of accepting items on the basis of familiarity (a heuristic processing mode) gradually increased. These results would be expected if familiarity reflected the assessment of a continuous dimension of intensity as described by classical signal detection theory.

[2] Interestingly, Scherer (1984) sees stimulus appraisal as an hierarchical and progressive process, whereby stimuli are checked for novelty, then pleasantness, then significance in relation to goals or plans, then for the relation between demands and resources, and finally for concordance with social norms.

Figure 4.1: Information processing regulation mechanism



This regulation mechanism is assumed to be simultaneously highly sensitive to characteristics of context and to the needs of the system. Thus, matching, although related to the objective familiarity of the stimulus and its context, is dependent on attentional factors (see Chapter II). The variable nature of the implicit feeling of familiarity associated with matching implies that some threshold must be exceeded before familiarity impacts mode of processing activation. The regulation mechanism operates continuously and thus at any moment during the process unexpected information may trigger more analytic processing.

Mood-as-regulation-mechanism: unique assumptions

Although the assumptions stated above underlie the mood-as-regulation-mechanism hypothesis, they define the information processing system independently of the feeling we call mood. What is fundamental to and distinctive about the mood-as-regulation-mechanism hypothesis is that it explains the impact mood is known to have in processing (the MIPE) by stating that mood acts as the processing system regulation mechanism. This possibility comes from a set of more specific assumptions:

1. *Positive affect is integral to the implicit feeling of familiarity.*
2. *At a conscious level implicit familiarity might be experienced in a number of different ways, including as a feeling of happiness (positive mood).*
3. *Affect that arises from other sources might not be distinguished from (the positive affect that is integral to) implicit familiarity.*

Although none of these assumptions has been explicitly tested in the literature, some evidence helps to corroborate their viability. In discussing each of these assumptions in more detail, the following sections will provide such evidence.

1. Positive affect is integral to feeling of familiarity

The first key assumption that defines mood as the mechanism of processing regulation is that positive affect is integral to the implicit feeling of familiarity postulated to regulate processing .

Familiarity has been characterized as a positive feeling. "The ease of processing, the fluency experienced, is understood to be experienced as a feeling of familiarity, a feeling with a positive affective tone" (p. 280, Pittman, 1992; see also Jacoby & C. M. Kelley, 1990; Jacoby, C. M. Kelley, & Dywan, 1989). By varying in intensity with the ease (fluency) with which a stimuli is processed (Jacoby, 1988; Jacoby & Dallas, 1981; Jacoby & C. M. Kelley, 1990; Pittman, 1992), the feeling of familiarity varies in its positivity. Thus, positive affect is integral to familiarity and whenever a stimulus is encountered, a feeling of greater or less positivity is activated.

The idea that positive affect is integral to the implicit feeling of familiarity may also be inferred from Olson, Roese, and Zanna (1996) and Mandler (1975), both of whom suggest that confirmation of subjective expectancies induce positive affect and that disconfirmation induces negative affect[3]. Thinking about implicit familiarity as a match between initial stimuli processing and stored representations makes it possible to view it as an unconscious confirmation of expectancies. Mismatch, and thus lack of familiarity, would in its turn equate to a disconfirmation of expectancies.

Further support for the assumption of an intrinsic relation between familiarity and positive affect may be found in the many parallels in their definitions. Both the concept of mood and the concept of familiarity have been defined as: a) feelings; b) with an internal cause that c) signal states of the self in terms of resources available to process currently received information. Also like mood, familiarity can be argued to be omnipresent since there is always some degree, no matter how low, of fluency in processing. Unlike mood, the feeling of familiarity is generated by a clear cause, namely the ease with which the stimuli is processed. However, the existence of a

[3] Moreover, these approaches see confirmation related to heuristic processing and disconfirmation related to a deeper and more careful processing of expectancy-relevant information

cause does not guarantee its conscious awareness. Thus, matching generates an implicit feeling of familiarity, but this is experienced as a *diffuse unfocused feeling*.

It is worth noting that some theorists have considered mood and familiarity as representing quite different classes of feelings. Familiarity has been argued to be a cognitive, non-affective feeling in opposition to mood which is a non-cognitive, affective feeling (Clore, 1992; Schwarz & Clore, 1996). According to these authors, cognitive feelings are feelings such as *certainty-uncertainty* (a feeling of confidence in a judgment), *surprise* (a feeling of disconforming expectations), *confusion* (a feeling of not understanding, not comprehending), *availability* (a feeling of ease with which the ideas come to mind) and *familiarity* (a feeling of having already been presented with the stimulus). Non-cognitive affective feelings are *mood* and *emotions*. Whereas cognitive feelings have the function of indicating the status of one's knowledge, affective feelings function to indicate how much and in what way something is good or bad (Clore & Parrott, 1994). *Mood* is a valenced affective feeling, being either positive or negative and therefore indicating good or bad. Cognitive feelings are not expected to be associated either with goodness or badness (Schwarz & Clore, 1996).

Schwarz and Clore's position regarding the definition of familiarity and mood does not seem compelling enough to reject out of hand the possibility that both feelings are experienced in very similar ways and that they share the same cause (a match of input and memory representation). As noted above, familiarity has been defined as a positive feeling. In fact it can even be argued that all of the feelings referred to in this view as cognitive are also valenced: *confidence*, *ease of retrieval* and *familiarity* are all seen as more positive internal signals than *uncertainty*, *difficulty*, and *unfamiliarity*. This possibility is also corroborated by the fact that both feelings have been induced in the laboratory by exactly the same manipulation: contraction of muscles. Stepper and Strack (1993) manipulated the subjective recall experiences of their participants by asking them to contract either the corrugator muscle or the zygomaticus muscle during the recall task. Contraction of the corrugator muscle (producing a furrowed brow) was assumed to be associated with the experience of effort, and thus to induce a feeling of lack of fluency, a feeling of difficulty in recall. Contraction of the zygomaticus muscle, in contrast, by producing a smile, was understood to be associated with a feeling of ease or fluency in recall. Results were congruent with these assumptions. Participants perceived themselves as more assertive if they recalled six assertive behaviors in the easy condition than in the effortful one. Exactly the same manipulation has been used to manipulate mood: whereas the contraction of the zygomaticus induces positive feelings, contraction of the corrugator muscle induces more negative feelings (Adelmann & Zajonc, 1989; Bodenhausen, Kramer, & Susser, 1994; Laird, 1984; Strack, Martin, & Stepper, 1988). Finally, there is no empirical evidence that familiarity and mood are distinctive feelings.

2. At a conscious level implicit familiarity might be experienced in a number of different ways, including as a feeling of happiness (positive mood).

   A second assumption that underlies the mood-as-regulation-mechanism hypothesis is that the positivity intrinsic to the implicit feeling of familiarity may be consciously experienced as positive mood or as other similarly experienced feelings.

Like other feelings, the implicit feeling of familiarity is assumed to be a barely noticeable, fleeting impression (Carlson & Hatfield, 1992). Since feelings in and of themselves do not have clear frontiers (e.g., M. S. Clark, 1982; Mandler, 1962; Schachter & Singer, 1962), they are not easily distinguished from each other and may easily be confounded (e.g., Jacoby & C. M. Kelley, 1987; 1990; Schwarz, 1990; Truax, 1984). Because of that, a feeling cannot always be quickly labeled. At any given moment individuals may not know the basis for their true phenomenal experience[4]. As matching is translated into a feeling with a positive tone, it is very likely to be experienced only as "positivity". Unless the situation induces an attribution of this feeling to the ease with which the stimuli were processed, or to having previously encountered the stimuli, it will continue to be experienced as such and may be consciously perceived in many different ways.

Several studies support this idea that the implicit feeling of familiarity can be experienced in different ways.

Witherspoon and Allan (1985) demonstrated that implicit familiarity, being experienced as fluency of processing, impacts subjective experiences of *time*. In their study, participants were asked to read a list of words on a computer screen, and later to judge the duration of words presented individually on the screen. Participants judged the exposure duration of previously presented words to be longer than the exposure duration of new words, suggesting that they relied on their experiences of fluency of processing as a basis for their judgments.

Begg and collaborators (Begg, Armour, & Kerr, 1985; Begg & Armour, 1991) showed the impact of implicit familiarity on perceived *validity*. In their studies, participants were asked to read a list of statements and evaluate each of them on their degree of interest. Later they were presented with a list including an equal number of

[4] Shields (1984) highlights this feature by showing that for most perceived subjective states there is no agreement as to whether the state should be considered as emotion or nonemotion. However, there does seem to be agreement about the valence of feeling (experienced as positive/pleasurable or negative/unpleasurable).

old and new statements and asked to judge their validity. Participants judged familiar statements as truer than unfamiliar statements.

Jacoby and C. M. Kelley (1987) in their turn showed that fluency of processing associated with familiar problems may be perceived as an experience of their being *easy to solve*. The real difficulty of a problem (difficulty for others) was systematically underestimated by participants who had read solutions to the problem in a earlier phase of the experiment. In addition, Jacoby and his colleagues (Jacoby, Allan, Collins, & Larwill, 1988) showed that the fluency with which previously heard sentences were processed was consciously experienced as *less disturbance in processing*. When listening to familiar and unfamiliar sentences against background noise at several intensities, participants judged the noise as less loud when familiar sentences were presented than when unfamiliar sentences were presented.

The fluency with which repeated names are processed also seems able to impact individuals' perceived *plausibility of a name being of a famous person* (Jacoby, C. M. Kelley, Brown, & Jasechko, 1989). In the first phase of these studies, a list of names correctly identified as nonfamous names was presented to participants. In a second phase, participants were asked to judge the fame of each of the names presented in a list that intermixed familiar and unfamiliar names. Results showed that familiar names were more likely to be called famous than new names.

In two arithmetic problem experiments, Reder and Ritter (1992) showed that implicit familiarity is able to be subjectively experienced as a *feeling of knowing* the correct answer. In these studies, participants were trained to know the answer of a set of arithmetic problems and asked to quickly assess whether they knew the answer to each of the presented problems or not. Results showed that similar looking problems for which participants did not know the answers were also likely to elicit a feeling of knowing.

More than 200 studies replicate Zajonc's (1968) "mere-exposure effect," showing that familiarity with a stimulus increases the *positivity, liking, interest value, attractiveness, pleasingness, appeal, pleasantness* and *preference* with which it is rated (see Bornstein, 1989, for a review). Some data also seem to suggest that different degrees of the implicit feeling of familiarity are perceived as different degrees of positivity. In one such study, Zajonc (1968, Exp. 2) subjected participants to 0 to 25 exposures of the same Chinese ideographs. In a second phase participants were asked to evaluate each Chinese ideograph in terms of whether it connoted "good" or "bad" affect. There was a positive relationship between number of exposures and average goodness rating.

Together these studies clearly suggest that the implicit feeling of familiarity is able to be interpreted in many different ways. The subjective experience of familiarity is itself the interpretation of an implicit feeling of past experience. It encompasses an attribution of "variations in fluency of processing of a stimuli" to its presence in *memory* (e.g., Jacoby, 1988; Jacoby & Dallas, 1981; Jacoby & C. M. Kelley, 1990; Jacoby, C. M. Kelley, & Dywan, 1989). Any situational cue that calls attention to memory will also lead to an attribution of the implicit feeling of familiarity to memory. This attributional process, dependent on situational cues, seem to be automatic, since it is very quick and requires little attention (Jacoby, Woloshyn, & C. M. Kelley, 1989).

However, not all situations cue memory attributions. As the literature review suggests, individuals seem to interpret implicit familiarity in a number of ways, depending on what the context suggests as plausible. In congruence with other approaches (e.g., Jacoby & C. M. Kelley, 1990), the mood-as-regulation-mechanism hypothesis stresses that the subjective experience of familiarity will depend on implicit and explicit situational cues. If the situation calls attention to the valence of the feeling without calling attention to a possible cause (there is no "apparent cause"), the feeling is likely to be experienced as a positive diffuse unfocused feeling (i.e. positive mood). Familiarity may serve as the label for the feeling that arises when an already known stimulus is encountered (Jacoby & Dallas, 1981). Feeling of knowing may be a label people use for experiencing positivity when looking for an answer to some question (Reder & Ritter, 1992). Liking, goodness, and preference, may be the labels used when current goals involve evaluation of a stimulus (Bornstein, 1989). These labels only become consciously available when individuals attend to their subjective experience of the situation. It may, thus, be that different labels are the only reason familiarity and mood are considered two totally independent feelings[5].

What is unique to the second assumption of the mood-as-regulation-mechanism hypothesis is not that the implicit feeling of familiarity may be experienced in different ways. Its uniqueness is related to the idea not only that mood may serve as a possible label for this feeling, but that it may also be a different type of label. Mood is a label that does not associate the implicit feeling of familiarity with a likely cause[6]. Because of that, mood is a kind of "default label," a label related to *how the feeling is consciously defined*, instead of a label that attributes the feeling to its possible cause.

Thus, the assumption of implicit familiarity being experienced as mood has both points in common and points of divergence with Zajonc's (1968) approach. Zajonc clearly suggests that mere exposure is associated with an increase in positive affect towards a stimulus. However, he did not specify the dimension on which the affective reaction was expected to be manifest, and, more importantly, he did not consider

---

[5] This does not mean that all proprioceptive experiences are identical and that emotions are only differentiated by their cognitive labels. I am only arguing that familiarity and positive mood are experienced in a very similar way, and thus, that a label might be needed in order to consider them as two distinctive feelings.

[6] One way to define the meaning of a feeling seems to be to associate it with a cause, giving it a cognitive label (Truax, 1984; Valins, 1966; Weiner, 1985).

repeated exposure as able to impact affective feeling not directed toward a target. Although different studies of the mere exposure effect have used different dependent measures showing that this affective reaction is manifested on different dimensions, none of them deal with generalized positive affect that is unassociated with a particular stimulus. That is, none of them have assessed mood ratings as dependent measures.

The assumption that implicit familiarity may be consciously experienced as mood is more consistent with Jacoby's attributional model (Jacoby & Dallas, 1981; Jacoby & C. M. Kelley, 1990). By arguing that fluency of processing may be attributed to whatever aspect of reality situational cues show to be appropriate, and not only to stimulus characteristics, this approach integrates the possibility of fluency of processing being attributed to mood.

Despite these suggestions that implicit familiarity can be experienced in many different ways, including as mood, no empirical studies directly assess this hypothesis. That is, there is no empirical evidence that directly suggests that mood serves as a label for an implicit feeling of familiarity when contextual cues make salient the feeling itself and when no other specific cause is easily identifiable.

3. Affect that arises from other sources may not be distinguished from the affect integral to implicit familiarity

A fundamental assumption of the mood-as-regulation-mechanism account of the empirical observation of the MIPE is a (mis)attribution one. It is assumed that the affect that arises for reasons other than an association with familiarity is not distinct from the "affect" that is integral to implicit familiarity. Affect arising for other reasons may thus be confounded with affect integral to implicit familiarity, and may thus be (mis)attributed to familiarity. Thus these "other" positive feelings may undertake the role of the positive implicit feeling of familiarity in regulation.

As previously noted, matching translates into a feeling and is thus "experienced" rather than "known". Thus, an encounter with a familiar stimulus which triggers an implicit feeling of familiarity is not necessarily consciously perceived as its cause. The perception of "familiarity" as a cause of the positivity felt is not always and necessarily automatically inferred (as the evidence just reviewed makes clear). It is only expected if something in the environment calls attention to it (as it is done in recognition tasks). In the absence of that, familiarity is only experienced or felt. Since feelings by themselves do not have clear frontiers, affect elicited by a source other than familiarity may be confounded with the affect integral to familiarity. Positive affect elicited by a different source may, thus, be *confounded* with implicit familiarity. Feeling good may be (mis)interpreted as feeling good because something is familiar[7].

However, and importantly for the efficiency of the mechanism of regulation, this is not always expected to occur. Although the similarity between the two feelings favor confounding, the situation must be *ambiguous* for confounding actually occur (see Truax, 1984; Jacoby & Whitehouse, 1989, for a similar argument). That is, affect that arises from sources other than familiarity should not be easily attributable to its true source and should not clearly oppose the actual implicit feeling of

[7] Corroborating this idea, mood and familiarity have been shown to have parallel impact on evaluative judgments. Positive moods in general induce more positive evaluations than non-positive moods ("How-do-I-feel-heuristic" -- Clore, Schwarz, & Conway, 1994; Forgas, 1994; Forgas & Moylan, 1987; Murphy & Zajonc, 1993; Ottati & Isbell, 1996; Schwarz & Clore, 1983, 1988). Familiarity has also repeatedly been shown to induce more positive evaluations than lack of familiarity ("Mere-exposure-effect," Zajonc, 1968; see Bornstein, 1989, for a review).

familiarity[8]:

If a feeling is attributed to a source, its quality becomes clearer, reducing the possibility of confounding, and thus the possibility of mood being (mis)attributed to implicit familiarity. Evidence from distinct fields suggests that by making the source of information clear, boundaries between feelings are established and (mis)interpretation is reduced. For example, Schwarz and Clore (1983) conducted telephone interviews and found that those individuals interviewed on sunny days reported higher satisfaction and happiness with their lives as a whole than those interviewed on a rainy day. However, if individuals were first asked to report the actual weather, the relation between their current feelings and their life satisfaction reports was eliminated.

Similarly, Murphy and Zajonc (1993; Exp1) showed that awareness of a feeling source can prevent mood from impacting evaluative judgments. In that study, participants were asked to evaluate a set of unknown Chinese ideographs. Each ideograph was preceded by either a subliminal or visible presentation of a happy or a frowning face (which were intended to elicit either more positive or more negative feelings). Participants who were unaware of these happy and frowning faces based their judgments on the feeling they provoked. In contrast, judgments of participants who were completely aware of the faces were not affected by this manipulation.

---

[8] The importance of these pre-conditions for confounding to occur can be understood with regard to the impact of mood on recognition judgments. The idea that positive affect is integral to the feeling of familiarity suggests that mood could also influence recognition decisions. However, in order for mood to be used as a cue for recognition decisions three conditions must hold. First, induced mood must be susceptible to (mis)attribution to the implicit feeling of familiarity associated with a specific memory item. Second, the mood induction (and thus the source of mood) must not be salient to individuals. Third, the valence of mood must not obviously oppose the familiarity value of each item. In fact, these conditions hold in very few situations. Thus, unless the situation is unusual, it is unlikely that individuals will attribute feelings to a stimulus that is encountered after the feelings emerge. Hence in a typical memory study previously generated feelings are unlikely to influence recognition judgments.

Lack of awareness of the true source of the implicit feeling of familiarity (stimulus repetition) also seems to enhance familiarity effects on evaluative judgments. Within a mere exposure experimental paradigm, Bornstein and D'Agostino (1992) found that individuals who clearly recognized that the stimuli had been presented before were able to attribute the way they felt to that experimental manipulation, rather than assuming they liked the previously seen stimuli. The results showed that stimuli seen for 5ms produced stronger mere exposure effects than stimuli presented for 500 ms. In a second study, the same authors gave participants who had been subliminally exposed to stimuli incorrect information that the stimuli were either old or new. Although also influenced by the relative familiarity of each stimuli, participants used the misleading information to "correct" their judgments. Thus, knowledge regarding the "real source" of the implicit feeling of familiarity prevents it be (mis)interpreted.

This fact is also corroborated by some findings associated with the illusory fame effect (Jacoby et al., 1989). Specifically, old names were less likely to be called famous than new names if names were rated immediately after the list of nonfamous names were read. In this case the source of the feeling of familiarity was made very clear. When fame ratings are delayed the source of this feeling is not consciously recollected, and judgments of fame are influenced by familiarity.

Thus, making clear the real source of the feelings, in circumstances where a (mis)interpretation is assumed to occur, seems to eliminate its judgmental impact[9].

---

[9] There may be several different consequences of the source of such information becoming clear (see, for example, Jacoby & Whitehouse, 1989). Individuals may engage in analytic processing whenever the relative information given by feelings is called into question. When the cause of affect is known, those feelings will be associated with that cause (e.g. the impact of a story with positive events) preventing their association with other causes or meanings (e.g. having previously encountered the stimulus). When individuals are consciously aware of a stimulus having been previously presented, the implicit feeling of familiarity is understood as explicit familiarity and is not able to be interpreted as having any other cause. In fact, this is a phenomenon that has not yet been fully studied or understood.

Actual familiarity with a stimulus also interferes with mood being (mis)interpreted as implicit familiarity. The (mis)interpretation of one feeling for the other may happen only when the two feelings are incongruent. A contrast between induced affect and affect intrinsic to familiarity promotes more clearer distinction between the two and counter-acts any possible (mis)interpretation. Some support for this hypothesis can be found in Bless and Fiedler (1995). In this study, happy individuals showed enhanced familiarity effects by responding to primed sentences more quickly than non-happy individuals. However their responses did not differ with regard to non-primed sentences. Thus feeling happy did not interfere with fluency of processing when induced mood and familiarity feelings were incongruent.

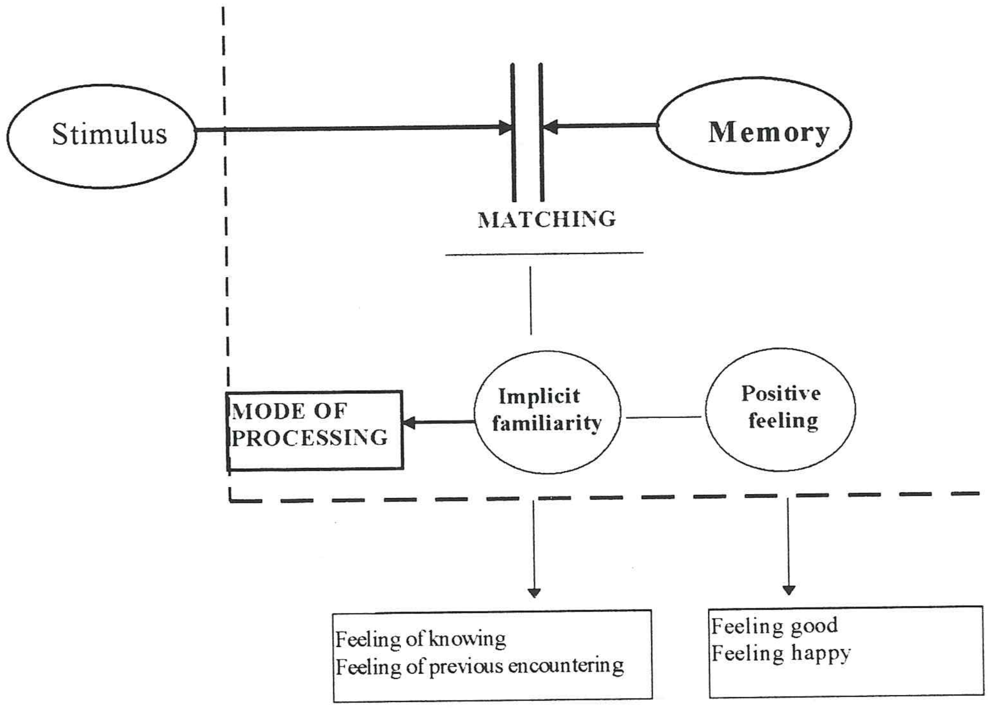
The complexity of the stimulus may also be understood to favor (mis)interpretations. Simple stimuli are either familiar or unfamiliar stimuli. Thus, even if confounding occurs it is not expected to change processing. Complex stimuli are associated with "less extremity" of implicit feeling. Because of this they facilitate (mis)interpretation and are expected to impact processing.

Some evidence of the impact of stimulus complexity on the implicit feeling of familiarity may be found in studies that compared mere exposure effects obtained with simple and more complex stimuli. The majority of these studies showed exposure effects to be greater for complex stimuli than for simple stimuli (see Bornstein, 1989, for a review), suggesting that complex stimuli induced less extreme feelings of familiarity.

Critical implications of unique assumptions

The mood-as-regulation-mechanism hypothesis assumptions presented above may be summarized in the following way: The fluency that results from a match between initial stimulus processing and stored representations is experienced as a positive feeling of familiarity. This feeling (which may be consciously experienced as mood) regulates information processing. Regulation is defined by positive affect confirming the adequacy of the default, non-analytic processing, and lack of positivity triggering analytic processing (see Figure 4.2). In addition, non-attributed positive affect induced by a different source in ambiguous circumstances may be confounded with implicit familiarity.

Figure 4.2. Processes assumed to underlie the MIPE



Thus, these unique assumptions extend previous ones by suggesting the integral association of positive affect with implicit familiarity, the impact of this feeling on experienced mood, and the functional equivalence of implicit familiarity and positive mood in triggering non-analytic processing.

Predictions derived from the mood-as-regulation-mechanism hypothesis

This section summarizes a set of predictions that can be derived from the assumptions underlying the mood-as-regulation-mechanism hypothesis.

1- A central and distinctive prediction of the mood-as-regulation-mechanism hypothesis is the idea that mood and familiarity are experienced as equivalent feelings. This leads to the following predictions:

  a) Manipulations of increased familiarity will induce a feeling with a positive tone that, given it is subjectively experienced as positive mood, will induce positive mood ratings.

  b) Manipulations of increased mood positivity will induce a feeling that may be (mis)interpreted as a feeling of familiarity, inducing effects that parallel those of manipulations of familiarity.

2- A second central assumption of the mood-as-regulation-mechanism hypothesis is that because of their integral association, mood and familiarity have identical regulatory roles in information processing. Two predictions derive directly from this assumption :

a) Manipulations of increased familiarity will induce non-analytic processing, whereas lack of familiarity will be associated with analytic processing.

b) Manipulations of positive affect will trigger non-analytic processing, whereas manipulations of non-positive affect will be associated with analytic processing.

Underlying the predictions presented above is the assumption that in favorable circumstances positive affect induced by a source other than familiarity may be confounded with implicit familiarity. Because of this confusion, it is possible for manipulations of mood to impact processing just as the affect associated with implicit familiarity does. This confounding is assumed to occur only in circumstances (designated as favorable) in which no clear definition of feelings occur.

Conclusion

The foundational assumptions substantiated in previous chapters define a regulatory process in which a feeling of implicit familiarity plays the regulatory role. The empirical data reviewed corroborate this idea by suggesting that familiar settings are associated with non-analytic processing whereas unfamiliar stimuli trigger analytic processing.

The unique assumptions of the mood-as-regulation-mechanism hypothesis argue that positive affect is integral to the implicit feeling of familiarity and that it is this relation that drives the MIPE. Mood influences the way individuals process information because affect is an information processing regulation mechanism. Because familiar situations feel good, they result in non-analytic processing. In contrast, lack of familiarity, lacking this experience of positivity, results in analytic processing. Since positive feelings induced by experimental manipulations may be (mis)interpreted as positivity associated with the implicit familiarity, they also may impact how information is going to be processed.

Supporting these assumptions, there seems to be a close parallel between the feelings of familiarity and mood. At an implicit level these feelings seem to be experienced exactly in the same way. Both positive mood and familiarity are pervasive, low intensity, valenced feelings. At a conscious level they differ with regard to their perceived causality. Whereas explicit familiarity seems to have a clearly identifiable cause, positive mood is perceived as a diffuse unfocused feeling. Thus implicit familiarity can apparently be subjectively experienced as "feeling good." Several studies corroborate this idea by suggesting that implicit familiarity may be consciously experienced in different ways. Familiarity and mood also seem to have a similar impact on how information is processed. Whereas most of the studies assessing the MIPE (see Chapter III), associated positive mood with non-analytic processing, some evidence suggests that familiar stimuli also induce non-analytic processing (and so that there is a FIPE).

Although different developments in the literature give some plausibility to these assumptions, no study directly tests either the hypothesis that mood and familiarity are equivalent feelings or the hypothesis that mood and familiarity have equivalent functions in processing. The corroboration of these two predictions would provide strong foundational support for the mood-as-regulation-mechanism interpretation of the MIPE. Descriptions of the first such direct tests are reported in the next chapter.

CHAPTER V:

Empirical evaluation of the mood-as-regulation-mechanism hypothesis

Four studies

The mood-as-regulation-mechanism hypothesis arises from the idea that a feeling of positive affect is integral to the feeling of familiarity. It is based on the assumptions that an implicit feeling of familiarity plays an important role in determining how information is processed. Familiar situations feel good, resulting in non-analytic processing. Unfamiliar situations fail to trigger this experience of positivity, and thus initiate more analytic processing. This experience of positivity in its turn may be subjectively experienced as positive "mood". Thus, feeling good may signal the presence of an implicit feeling of familiarity. Because of the integral association of positive affect and familiarity, manipulations and inductions (even natural ones) of mood may be interpreted as familiarity by the information processing system. Mood induced by a different source is taken to be or confounded with, the feeling that is generated by a matching of information with a memory trace. The assumption implies that manipulations of the feeling of familiarity would trigger changes in reported mood, that manipulations of mood would impact judgments as do manipulations of familiarity, and that manipulations of mood and of implicit familiarity would have parallel effects on information processing. The four experiments described here were designed to demonstrate these effects.

Experiment 1

The impact of implicit familiarity on mood

Experiment 1 was designed to demonstrate that the implicit feeling of familiarity can be subjectively experienced as positive mood. Such a finding would thus be consistent with the hypothesis that subjectively the feeling of familiarity and positive mood are experienced in the same way. It was adopted the strategy of manipulating familiarity and measuring participants' feelings with the expectation that those experiencing the implicit feeling of familiarity would perceive themselves to be in more positive moods that those not doing so.

To manipulate this feeling of familiarity, a paradigm introduced to investigate the effects of familiarity on ratings of validity (Begg & Armour, 1991; Begg, Armour, & Kerr, 1985) was adopted. The feeling of familiarity is produced in this paradigm by varying the number of presentations or repetition of a stimulus. In the procedure typical of these studies, participants are invited to complete two tasks intended to pre-test some experimental material: simple statements whose truth or falsehood is unknown. In the first task they listen to a list of tape recorded statements. An equal number of true and false statements are presented in a random order. Each time they listen to a statement, participants rate "How interesting" each statement is. In the second task participants are presented with a list of statements (generally more than 60 of them) printed on paper. This test-list contains a similar number of previously heard ("old") and not previously heard ("new") statements randomly ordered. As each statement is presented participants rate its "perceived credibility" on a seven point scale (1- *certainty false*, 2- *probably false*, 3- *possibly false*; 4- *completely uncertain*;5- *possibly true*; 6- *probably true*; 7- *certainty true*). It is made clear to participants that half of the statements are actually true and half are actually false. The results of studies using this paradigm typically show that repeated (old) statements are rated truer than new statements (Bacon, 1979; Begg & Armour, 1991; Begg et al., 1985; Begg, Anas, & Farinacci, 1992). Such judgments of truth have been shown to be made on the basis of a diffuse "feeling" that the item is familiar.

The strength of this effect is one of the reasons this experimental paradigm was used in initial tests of the mood-as-regulation-mechanism hypothesis. Given that this experimental paradigm produces a very reliable effect, it validates the claim of having manipulated the implicit feeling of familiarity: familiarity has been effectively manipulated if results re-produce the typical pattern of increased validity ratings for repeated sentences. If familiarity with its positive tone gives rise to a subjective experience of positive mood, manipulations of the feelings of familiarity would trigger consistent changes in reported mood. Specifically, those presented with familiar sentences would experience more positive mood than those presented with novel sentences.

Method

Participants and design

A total of 185 Portuguese university students were recruited for participation in this study, either in a class context (115 subjects) or in a laboratory setting (70 subjects)[1]. Either a class (if the test was in a class context) or a subject (in a laboratory setting) were randomly assigned first to be exposed to a list of repeated and novel items (to verify that such exposure produced validity judgments that replicated previous research) and then to experience a final block of either familiar or non-familiar items (to assess whether the feeling of familiarity varied with self-reported positive affect). Eight stimulus sets were created to counterbalance the true and false versions of statements participants received as well as the old or new status of the statements. The design was thus a 2 (familiar or non-familiar final block) x 8(stimulus set) between subjects design.

Stimulus material

Forty-six *neutral statements* were used in this experiment. Neutral statements were defined as statements that were classified as true by between 40%-60% of pre-test judges, both in their original (true) form and in a changed (false) form (following Begg et al., 1985). A true and a false version of 250 sentences of obscure truth value were used in pre-test. From this statements 89 were translations of those selected by Begg et al. (1985, 1992) from Bacon, (1979). The other 161 statements were developed with facts taken from an encyclopedia, paralleling as much as possible the structure used in those statements[2]. For each statement a false version was prepared by altering only one detail of the original, such that the two statements could not both be true. For example, the true sentence *A baby elephant sucks with its mouth, not*

[1] The difficulty of bringing participants into a laboratory made the use of this two setting necessary. Preliminary analysis indicated that setting made no difference to the pattern of results. However, for mere reasons of statistical power, some results in either of the settings alone did not reach statistical significance.

[2] Statements referring to American historical events were replaced by statements referring to similar events in Portuguese history.

with its trunk had as a false version the sentence, *A baby elephant sucks with its trunk, not with its mouth.*

Statements were organized in 5 sets of 100 which were each presented to 20 judges (a total of 100 judges). Judges rated the probability of each statement being true or false by circling a number on a scale with 1= *certainly false,* 4=*completely uncertain,* and 7= *certainly true.* All the statements that satisfied the criterion of neutral statements were selected for this study. Selected statements (see Appendix 1.1) were all rated around the "uncertain" point of the scale (ranging between 3.00 and 5.00). Fifty-two selected items were divided randomly into two sets, A and B (4 other items with similar ratings were retained as buffer items). Half of the randomly presented statements in each set were presented in their true form and the other half in their false form. The items presented as true and false were counterbalanced, so that there were two versions of each list (A1, A2 and B1, B2). Each list of 26 words was preceded by the 4 buffer items and recorded by a female voice at the rate of one sentence every 10 seconds. One of these lists was used in the "initial pre-test" presentation of stimulus materials, and items from that list (repeated, familiar items) as well as items from one of the other lists (novel, unfamiliar items) were used as the validity judgment stimulus materials, resulting in eight different stimulus versions in all[3] (see Appendix 1.2).

Procedure

Initial presentation of items. Instruction booklets were distributed to all subjects and the first page of general introduction was read aloud by the experimenter (see Instructions in Appendix 1.3). Participants were asked to collaborate in 3 small

[3] Pre-testing each stimuli set verified that was equivalent in the degree of "perceived amusement" that its statements elicited.

pre-tests, in which they would provide ratings of material that was being evaluated for use in a future study. The first rating was presented as pre-testing how interesting certain sentences slated for use in a future study were. Participants were asked to listen carefully to statements presented one at time at a set speed and to circle for each item the number on a scale (where 1= *not interesting* and 7= *very interesting*) that best represented their opinion regarding how interesting the topic was. Participants were presented with answer sheets that distinguished the first 4 "practice" items from the 26 "pre-test" items (on which participants were to concentrate). They then heard 30 statements presented at the rate of 1 every 10 seconds by a female voice. Approximately one-quarter of the participants heard each set (A1, A2, B1, or B2).

The experimenter then read aloud the instructions for the next two tasks. Participants were first asked to judge whether 48 written statements (again slated for a future study) were true or false. They were informed that half of the 48 sentences were true and half were false. Before indicating their opinions, participants were also told about the third task they were to perform: as soon as they had completed the truth ratings of the sentences they were to turn to a final questionnaire and rate how descriptive of themselves each of the four statements presented there was.

<u>Presentation of novel and repeated items to verify familiarity manipulation</u>. Participants then proceeded to make validity judgments about each of 48 statements. This list of statements was initiated by two novel items used as buffers, then followed by a random list of repeated (i.e. ones that had just been presented in the "interest pretest") and novel (i.e. ones that hadn't appeared in the "interest pretest") items for a total of 36. This presentation of novel and repeated items constituted a replication of Begg et al.'s (1985, 1992) procedure and allowed us to verify that in a within subjects context, repeated items generated the feeling of familiarity that produced higher

validity ratings than did novel items. A randomly selected half of the participants read 20 novel items randomly interspersed with 16 repeated items, whereas the other half read 20 repeated items randomly interspersed with 16 novel ones. So that it could be better balanced the total number of novel and repeated items presented, participants in the former group were assigned to the familiarity condition whereas the latter group was assigned to the non-familiar condition.

Manipulation of familiarity. Immediately after the random presentation and rating of novel and old items, participants read and rated a final block of 10 novel or old items. The participants assigned to the familiarity condition saw 10 items that were all repeated items from the interest pre-test. In the non-familiar condition, participants saw 10 novel items.

Dependent Measures

Truth ratings. For each item participants circled a number on a 7- point scale anchored as follows: 1= *certainly false*, 2 = *probably false*, 3= *possibly false*, 4= *completely uncertain* , 5= *possibly true*, 6= *probably true* and 7 = *certainly true*.

Mood measure. Participants then completed the self-description task, which served as a mood measure. A small version (with 4 items) of a Likert type scale of 29 items previously constructed to assess mood in a Portuguese population (see Appendix 1.4) was used to assess participants' current mood state. The items My state of mind is positive; I am feeling a little bit down, I would like to feel much better than I am feeling now; I am not feeling very well, were rated on 11-point scales measuring how well each sentence described current mood (1-It describes it very badly;11-It describes it very well). Negative items were reversed so that high scores indicated positive mood.

When both tasks were complete, participants were asked if they had noticed that some items had been repeated from the initial pretest. They were then asked if, when they encountered an item that they thought had been from the initial pre-test, they had purposively rated it as true. Both questions were answered either yes or no.

Results and Discussion

Eleven participants reported explicitly trying to use recall of items from the initial interest pretest to decide if a statement was true or false. Since the use of such a strategy could provide an alternate explanation of results, data from these participants were excluded from further analysis. The fact that a few participants failed to answer one or more validity or mood items produced missing values that explain the variation in reported degrees of freedom.

Truth ratings. Participants' estimations of the truth of the first 36 repeated and novel statements were averaged and entered as a within subjects factor in a 2 (familiar or unfamiliar final block) x 8 (stimulus set) x 2 (repeated and novel sentences) mixed analysis of variance (ANOVA) (see Appendix 1.5.1). As expected, repeated statements were rated as truer (M= 5.51) than novel statements (M= 4.26), F (1,154) = 267.75, p<.0001, MSe= .482. Although present in all conditions and for all sets of the material, this effect varied somewhat in magnitude, producing a significant interaction with stimulus set, F (7,154)= 2.16, p<. 04, that also differed in magnitude in the familiar and unfamiliar conditions, producing a significant three-way interaction, F(7,154)=2.31, p<.028[4] (see Table 5.1). No other effects were significant. This finding replicated the primary result from previous studies, suggesting that repeated

[4]The two-way interaction is observed because the difference between truth ratings of novel and repeated items ranges from 0.83 to 1.48 in the 8 different stimulus. The three-way interaction emerges because the stimulus sets in which the effect is weakest and strongest differ in the familiarity and the unfamiliarity conditions.

sentences had indeed induced an implicit feeling of familiarity that then translated into higher validity ratings (e.g., Begg et al., 1985, 1992) and indicating that the "feeling of familiarity" had been successfully induced.

Table 5.1: Truth ratings means and standard deviations by familiarity condition and stimulus set. Experiment 1.

	UNFAMILIAR CONDITIONS		FAMILIAR CONDITIONS	
TRUTH RATINGS	NEW	OLD	NEW	OLD
VERSION 1	4.18 (.37)	6.05 (.66)	4.50 (.38)	4.88 (1.29)
VERSION 2	4.23 (.24)	5.54 (.91)	4.46 (.50)	4.83 (.84)
VERSION 3	4.50 (.52)	5.27 (1.00)	4.40 (.45)	5.36 (.73)
VERSION 4	4.31 (.33)	5.55 (.89)	4.23 (.34)	5.61 (1.23)
VERSION 5	4.24 (.51)	5.44 (1.04)	4.20 (.39)	5.97 (1.06)
VERSION 6	3.92 (.50)	6.24 (.78)	4.20 (.56)	5.63 (.99)
VERSION 7	4.03 (.50)	5.26 (.72)	4.25 (.37)	5.62 (1.03)
VERSION 8	4.01 (.40)	5.39 (.98)	4.36 (.34)	5.76 (.91)
Means:	**4.18**	**5.59**	**4.33**	**5.46**

Truth ratings of each of the 10 statements presented at the end of the list were also averaged as a further check on the effectiveness of this manipulation. Given the results just reported, these 10 statements were expected to be rated as truer in the familiarity condition (since they were all repeated items) than in the non familiarity conditions (where they were all novel items). The mean evaluations of these 10 statements (see Table 5.2) were analyzed in a 2 (familiar or unfamiliar final block of items) x 8 (stimulus set) between subjects ANOVA[5] (see Appendix 1.5.1). As expected, repeated sentences were perceived as possibly or probably true (M=5.41), whereas participants were uncertain about the truth of novel sentences (M= 4.12), F (1,155) =99.10, p<.0001, MSe=.672).

Table 5.2: Truth ratings of the last 10 items, means and standard deviations by familiarity condition and stimulus set. Experiment 1.

	UNFAMILIAR CONDITION	FAMILIAR CONDITION
VERSION 1	4.40 (.74)	4.93 (1.44)
VERSION 2	4.45 (.52)	5.14 (.87)
VERSION 3	4.07 (.58)	5.14 (.84)
VERSION 4	3.95 (.35)	5.63 (1.07)
VERSION 5	4.10 (.50)	5.69 (1.03)
VERSION 6	3.77 (.59)	5.51 (.70)
VERSION 7	4.15 (.34)	5.59 (1.11)
VERSION 8	4.15 (.29)	5.88 (1.24)
Means:	**4.12**	**5.41**

[5] As it can be seen in Appendix 1.5.1, the distribution of truth ratings of the 10 last Old and New statements are different. This difference of distribution arise from the tendency to rate with high confidence Old items as being true (select the number 7 of the scale) whereas the distribution of ratings associated with the New statements is centered on the uncertainty point. The characteristics of these distributions promotes violations of the assumptions of normality and homogeneity of variances associated with a Analysis of Variance test. The test that have been considered to resist to this violations (Lindman, 1974). However recent studies have demonstrate the F test is unsatisfactory when there are unequal variances, see Wilcox, 1998 for a review). One problem might be a lack of power for detecting real differences between means, which does not disturb the statistical analysis presented here. However it is also possible that the rejection of the null hypothesis was associated with unequal variances rather than unequal means. The fact that there is no correlation between means and variances might reduce this possibility. Nevertheless we also analyzed the data with non-parametric tests (Kruskal -Wallis and Median tests). Results replicate the ones presented with the analysis of variance giving reliability to its results.

Replication of the finding that repeated, familiar items were seen as truer than non-repeated novel ones thus validated the manipulation of familiarity, and set up the conditions for an appropriate test of the hypothesis that familiarity would be experienced as positive mood. Given that repeated items indeed appeared to be more familiar, it was predicted that participants who then judged a block of repeated items at the end of their list should experience this familiarity as being in more positive moods relative to those who judged novel and unfamiliar items at the end of their list.

Ratings of Mood. Preliminary analyses of the mood ratings indicated that one of the mood measurement items (*I would like to feel much better than I am feeling now*) was only weakly associated ($r<.50$) both with the other mood items and with the total score on the 4-item scale. Its elimination increased the average inter-item correlation from .54 to .64 and the Cronbach's alpha coefficient of the other three items from .81 to .85. Responses on the other three items were thus averaged in a single mood index. Preliminary analysis of the distribution of this index revealed that mood ratings of seven participants deviated extremely from those of other participants. These seven outliers were then eliminated from further analysis. The mood index scores (see Table 5.3) were analyzed in a 2 (familiar or unfamiliar final block) x 8 (stimulus set) ANOVA (see Appendix 1.5.2). The analysis revealed a main effect for familiarity, $F(1, 144)=4.57$, $p<.03$, MSe 5.78[6]. Participants reported their mood as significantly more positive ($M=7.14$) after evaluating familiar statements than after evaluating unfamiliar statements ($M=6.30$). No other effects were significant.

[6] When mood ratings from the seven outliers were not eliminated, the effect of familiarity was also present, $F(1,151)=3.89$, $p<.05$, $MSe= 6.18$, with familiar participants happier (M= 7.10) than non familiar participants (M= 6.32) (see Appendix 1.5.2).

Table 5.3.: Mood ratings means and standard deviations by familiarity condition and stimulus set, Experiment 1.

	UNFAMILIAR CONDITION	FAMILIAR CONDITION
VERSION 1	5.78 (3.07)	8.03 (2.42)
VERSION 2	6.72 (2.71)	7.68 (2.45)
VERSION 3	7.39 (2.17)	7.29 (2.64)
VERSION 4	6.34 (1.61)	7.52 (2.77)
VERSION 5	4.77 (2.91)	7.41 (2.82)
VERSION 6	5.72 (2.54)	6.25 (2.28)
VERSION 7	6.59 (1.38)	6.42 (2.36)
VERSION 8	7.13 (1.55)	6.50 (1.81)
TOTAL	**6.30**	**7.14**

In this experiment the presence or absence of a set of familiar statements was manipulated to vary participants' feelings of familiarity. If perceivers used the ease or fluency of activation of the memory trace associated with each sentence to assess its truth value, people presented with repeated statements should have experienced familiarity more than those presented with novel statements. If this positive feeling of familiarity was subjectively experienced as positive mood, then it was expected participants rating familiar sentences to report being in better moods than those rating unfamiliar sentences. This is just what was found. The results were thus consistent with the hypotheses that manipulations of the feeling of familiarity would produce parallel variation in self-reported mood, consistent with the idea that positive affect is integral to the feeling of familiarity.

These findings do not eliminate alternate possibilities, however. The same pattern of results would have resulted if familiarity, rather than being a positive feeling consciously experienced as positive mood, induces positive mood. Such a consequence of familiarity is hypothesized in response competition explanations of the mere exposure effect (see for example, Bornstein, 1992). Unfamiliar stimuli evoke a large number of competing responses, triggering an unpleasant state of arousal as the individual attempts to select the most appropriate response. In contrast, familiar stimuli are associated with reduced response competition, and thus with more pleasant feelings.

The results of Experiment 1 might also be explained by the possibility that successful goal attainment triggers positive affect (Simon, 1969; Wyer & Srull, 1989). From this perspective, mere completion of the task (goal attainment) would produce positive feelings. Familiarity could enhance this effect by conferring more confidence on participants' judgments of truth or falsehood. Some aspects of the data are consistent with such a possibility. First, even participants in the unfamiliar condition report being in slightly positive moods (M= 6.32 on an 11 point scale). Second, participants judging the final set of novel sentences report being less certain (M= 4.12) than those evaluating familiar sentences (M=5.41). However, other aspects of the data argue against this alternative. Positive affect was not related to judgmental confidence ($r < .10$), as might be expected from this perspective. Thus although task completion might induce positive feelings, these feelings did not explain the differential pattern of validity judgments obtained in the novel and familiar conditions.

Experiment 2

The impact of induced mood on validity ratings

The results of Experiment 1 indicated the positive feeling of familiarity could be subjectively experienced as positive mood. The second experiment was designed to provide further support for the mood-as-regulation-mechanism hypothesis while helping eliminate some of the alternative explanations of the results of Experiment 1. The idea that positive mood is integral to the feeling of familiarity also implies that positive mood, if it is (mis)attributed to familiarity, should produce the same effects that feelings of familiarity do. Thus the primary goal of Experiment 2 was to test the hypothesis that induction of positive moods would affect truth ratings in the same way that manipulations of familiarity do. Because feelings of familiarity might vary with, and thus affect the judgment of, any actual stimulus sentence (Begg & Armour, 1991), and because such feelings of familiarity might disrupt a manipulation of mood, a situation in which participants could use only their affective state in making their judgments was created. This was accomplished by inducing non-positive (neutral) or positive mood and then leading participants to believe (falsely) that they had been subliminally exposed to stimulus sentences whose validity they were then forced to judge. It was predicted that participants in positive moods would make more extreme validity judgments than those in neutral affective states. Results consistent with these predictions would also help eliminate alternate explanations of results in the first study. Neither the idea that familiarity induces positive mood by itself, nor the idea that goal attainment triggers positive mood, suggest that positive mood would produce the same effects as feelings of familiarity on validity judgments. In contrast, the mood-as-regulation-mechanism hypothesis implies that participants might well perceive their current affective state as a familiarity cue, thus influencing their evaluations.

Method

Participants and Design

A total of 93 (25 male and 68 female) University of California, Santa Barbara (UCSB) undergraduates were paid $10 to participate in the study. Participants were randomly assigned to a negative, neutral, or positive mood condition.

Procedure

Participants were invited to sit in front of an IBM-PC computer monitor on which all instructions were presented (see Appendix 2.1) . Initial instructions indicated they would participate first by evaluating a newspaper article for use in a future experiment (actually a cover story for the induction of mood) and then in a study investigating "unconscious perception."

Induction of mood. A particular mood state was induced by having participants evaluate one of three different manufactured newspaper articles (see Appendix 2.2). Positive mood was induced by evaluation of an article called "*Meeting them more than halfway*" describing a reunion of old friends at a country inn. Neutral mood state was induced by having participants evaluate an article, entitled "*A different kind of physician*," which described an experimental program for medical students. Finally a negative mood state was induced by having participants evaluate an article referring to the victims of a cloud of lethal volcanic gas, entitled "*Cameroon's valley of Death*". Each article was a page in length and was presented in newspaper-like two-column format to preserve the cover story. These materials were adapted from Kuykendall and Keating (1990) and have been used successfully as mood inductions in this population (Queller, Mackie, & Stroessner, 1996; Wegener & Petty, 1994, Exp. 2; Wegener, Petty, & Smith, 1995, Exp.2). Participants read the articles and then turned to the computer screen where they responded to two seven-point scales to indicate "*How much did you enjoy reading this article*?" and "*How good or bad do you think the article was*?"

Validity decisions. Immediately after making these two ratings, participants were introduced to what they thought was a separate study. In this "study of unconscious processes" participants were asked to attend carefully to a black dot presented in the center of the computer screen. The dot appeared to flash twice before disappearing. Participants were led to believe that each flash signaled the very brief presentation of a short sentence on the screen. They were warned that they would not be aware of actually seeing the sentences, but that some aspects of them would be unconsciously processed and thus affect their subsequent performance on a task asking them to guess some of the sentences' features.

A dot was then rapidly presented 3 times in the middle of the screen, giving the illusion of two flashes (sentences being presented). Participants pressed either the T (true) key or the F (false) key, using the first answer that popped into their heads, to complete the following sentence: "*My feeling is that the two sentences were...*" Only after completing this forced decision task were they asked to rate their perception of the two sentences' validity. To do so, they used a rating scale similar to the one used in Experiment 1 (where 1= *certainly false*, 4= *completely uncertain*, and 7 = *certainly true*).

Check on manipulation of mood. Finally participants answered a "post-experimental questionnaire" where they rated their current mood state. A first item asked participants to report how they "*feel right now*" using on a 9-point (1=*sad* and 9=*happy*) scale. A second item allowed participants to report their mood "*at this very moment*" using a 9-point scale (anchored with 1=*bad* and 9=*good*). After completing the questionnaire subjects went on to participate in other experiments.

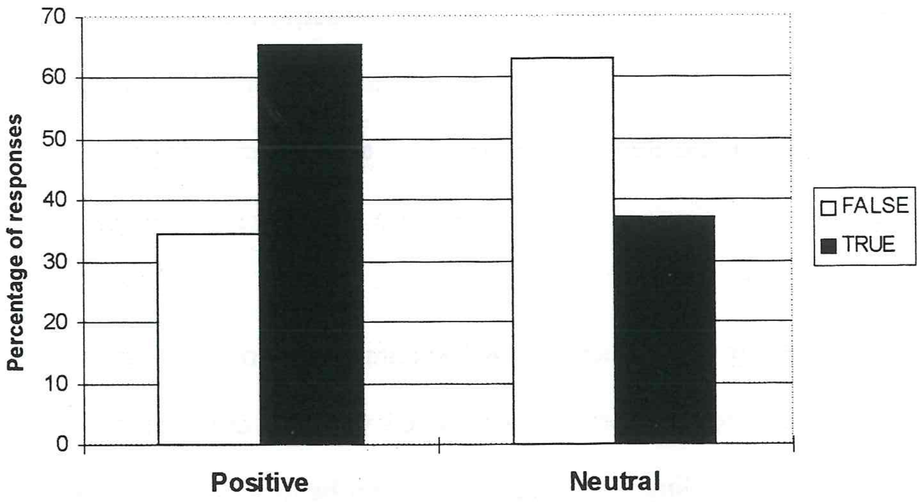
Results and Discussion

Effectiveness of mood manipulation. As participants' ratings of their feelings at that *precise moment* and of their *current mood* were correlated (r=.77, $t(92)$=11.44, p<.0001), these ratings were averaged to form a general mood index. Mood conditions were then compared on this general mood index. The hypothesis that a significant positive linear trend characterized these results was rejected (t<1). The rejection resulted from an ineffective manipulation of negative mood state (M=6.12). Pairwise comparisons (see Appendix 2.3) revealed only one reliable difference in the expected direction: participants in the positive mood condition rated their mood significantly higher (M=6.52) than those in the neutral mood condition (M=5.70) ($t(90)$= 2.17, p>.016, Se=.38, one tailed). Further analysis will only contrast the conditions associated with the effective manipulation of positive and neutral mood (see Appendix 2.4 for a full report of results).

Validity Decisions. Participants in positive moods were expected to judge the statements they thought they were processing subliminally as truer than would participants in neutral moods. Consistent with this prediction, 65.6% of the happy participants judged the sentences to be true, whereas only 37% of the subjects in the neutral mood condition judged them to be true. Conversely only 34.4% of the happy judged the sentences to be false whereas 63% of the subjects in the neutral mood condition judged them to be false (see Figure 5.1). The difference between these two distributions of responses was significant, $X^2(1, N = 60) = 4.79$, $p < 0.03$.

The proportions of true responses in each mood condition were also compared to those expected if participants were simply guessing. The statistics associated with the one-sample test for the parameter of a binomially distributed variable and the one-way p values associated with them were then computed for each condition. The proportion of true responses made by participants in positive moods was significantly higher than 50%, $Z=1.71$, $p< .05$, and the proportion of true responses made by non-positive mood participants was marginally lower than 50%, $Z=-1.41$, $p<.08$.

Figure 5.1: Percentage of True and False judgments made by participants in positive and neutral moods , Experiment 2.



Assessment of the confidence with which True and False decisions were made revealed no significant differences between the two mood conditions ($t<1$) (see Appendix 2.3). This result seems to be due to the fact that most participants (66%) used the "uncertain" point on the response scale. Nevertheless, the judgment data show that this uncertainty was resolved quite differently for happy participants compared to neutral participants.

Given that analytic processing was impossible because no stimuli were actually presented, it appears that participants used their subjectively positive feelings as a cue to decide that the statements were true, just as a feeling of familiarity would typically have been used. Thus the hypothesis that familiarity and positive mood are experienced in the same way received further support. These data are made even more compelling by the fact that positive mood had this impact, even though positive mood was induced prior to presentation of all sentences. In contrast, the feeling of familiarity is induced by each presented stimulus item and its cue value is no doubt enhanced by the relative feelings of familiarity engendered by different items.

Manipulating mood state in this experiment helped rule out interpretations of Experiment 1 that focused on affective consequences of successful goal attainment. Given that an effect associated with a manipulation of familiarity also occurred when mood was manipulated, it is unlikely that the greater confidence in validity judgments induced by familiarity caused the relation between familiarity and mood observed in Experiment 1.

Neither Experiment 1 nor Experiment 2 allowed us to distinguish completely between different hypotheses associated with the contention that positive mood is integral to the feeling of familiarity. It might be that familiarity and positive mood (as typically defined) are one and the same feeling, that familiarity causes an independent feeling of positive mood or that both familiarity and positive affect occur independently and might be (mis)interpreted as one another. In Experiment 1, the positive tone of familiarity might have directly induced positive mood ratings, might have caused positive mood which in turn induced positive mood ratings, or might even have been (mis)interpreted as positive mood, producing positive mood ratings. In this second experiment, the fact that induced mood state appeared to be (mis)interpreted as a feeling of familiarity might be attributed to the possibility that felt positivity and familiarity are one and the same. However, it could also be attributed to the possibility that positive mood, having been caused by familiarity, was interpreted as a signal of familiarity's presence or that positivity was simply (mis)interpreted as familiarity. Nevertheless these two studies clear suggest that positive mood and implicit familiarity are related feeling.

Experiments 1 and 2 provided support for the mood-as-regulation-mechanism hypothesis by showing first that the experience of implicit feelings of familiarity was accompanied by reports of feelings of positive mood, and second, that the experience of positive mood influenced validity judgments in exactly the same way that implicit feelings of familiarity typically do. In the next two experiments, I sought further evidence that the implicit feeling of familiarity has the same information processing effects as do typical manipulations of positive affect.

Experiment 3

The impact of familiarity on persuasive processing mode

From the mood as regulation perspective, manipulations of either feelings of familiarity or positive affect should bring about the same pattern of results. If the mood-as-regulation-mechanism hypothesis is correct in assuming that positive mood acts as a regulator of information processing because it accompanies the feeling of familiarity, then the feeling of familiarity should promote the same information processing effects as does positive mood. Thus manipulations of familiarity should result in the same pattern of results as manipulations of mood.

Most investigations of the impact of positive compared to non-positive moods on information processing have had as their theoretical framework dual processing models of persuasion such as the Heuristic-Systematic Model (Chaiken, 1980; 1982; 1987) and the Elaboration Likelihood Model (Petty & Cacioppo, 1981, 1986). In these studies mood is independently manipulated before participants are presented with a message comprising either weak and specious or strong and compelling arguments. The manipulation of argument quality provides a means of assessing participants' message processing mode (Petty & Cacioppo, 1986; Petty, Wells, & Brock, 1976). A differential impact of weak and strong arguments on attitude change (that is, strong arguments produce attitude change and weak arguments do not) is taken to indicate that the persuasive message benefited from extensive elaboration. If, in contrast, attitude change is unrelated to argument quality, it is usually assumed that the persuasive message was processed more superficially. These studies have typically produced attitude change results indicating extensive processing following induction of a sad or neutral mood but more superficial processing following induction of positive mood.

Assuming that the feeling of familiarity promotes the same information processing effects as positive mood, it should be expected that participants familiar with a persuasive message should show evidence of superficial processing just like participants in a positive mood. To test this hypothesis different levels of familiarity were induced by presenting message arguments zero, one, two, or four times before participants actually responded to the persuasive content of the persuasive message. Thus, the feeling of familiarity was manipulated before encoding, just as mood typically is. Several actions were taken to prevent participants from thoroughly processing the message content on their first exposure, while allowing them full capacity to do so when attitudinal judgments were elicited. First, the message addressed an issue that was of relatively low interest and involvement for participants. Second, message repetition was spaced rather than massed, with each repetition occurring with a different non-semantic processing goal. Third, participants read the message with the explicit goal of forming an opinion towards the issue in a task separate from the one(s) of evaluating its physical qualities. In addition, the separation of the familiarity induction from the request for attitudinal judgments approximated the procedures both of persuasion studies in which MIPE has been studied and of other studies in which familiarity is manipulated (e.g. Arkes, Boehm, & Gang Xu, 1991; Begg et al., 1985, 1992; Jacoby, 1991, 1996). The choice of four levels of repetition was exploratory. The basic expectation was that the non-repetition condition would differ from those in which the message was repeated.

However, there was no *a priori* expectations regarding how many repetitions would be necessary to induce a feeling of familiarity about the message (especially given that this cut point might vary with context, Yonelinas, 1994).

Method

Participants and Design

One hundred twenty UCSB undergraduate students (85 females and 45 males) received $10 to participate in the experiment. Participants were randomly assigned to the cells of a 2 (strong or weak message quality) X 4 (0,1,2, or 4 repetitions) between groups factorial design.

Procedure

Three to six students participated in each session. Initial instructions informed participants that they would be involved in two different studies, the first of which involved evaluating some stimulus materials for use in a future study. As these materials were to be presented by computer, participants were seated individually in visually isolated booths in front of an IBM-PC and a tape recorder. Computer-generated instructions then diverged depending on experimental condition.

<u>Presentation of strong and weak messages</u>. With the exception of those in the no repetition condition, participants were asked to don headphones so that they could listen to a recorded message. A yellow dot indicated the channel on which the message would be presented and participants were instructed to put on the headphones so the active channel was presented to their left ear if they were right

handed and to their right ear if they were left handed[7]. Participants heard a female voice delivering a message that argued against the implementation of governmentally enforced controls on American industry in order to minimize the effects of acid rain on the North Eastern states. Participants heard either a strong version (68 seconds) or a weak version (62 seconds) of the arguments presented in support of this position (Worth & Mackie, 1987). Pretesting of this issue revealed that UCSB students were not especially involved with the issue (M=5.05, $S.D.$ = 2.46 on a 9-point scale where 9 indicated high involvement) but that 77% of them favored mandatory governmental controls (M= 6.99, SD= 1.61 on a 9-point scale where 9 indicated extreme agreement). The presented message was thus counter-attitudinal.

Message repetition. Participants were then asked to evaluate some of the message's features. They were not informed in advance about the number of times they would be invited to listen to the message, nor the particular feature(s) that they would be required to evaluate. After putting on the headphones, participants pressed the space bar on the computer keyboard to receive a processing goal (that is, the feature to be evaluated) and then pressed a play button to initiate the computer-presented audio message. The end of the message was marked by a beep that prompted participants to press a stop button and follow further instructions on the computer screen. They were then asked to evaluate the tape in terms of the relevant feature using the keyboard to respond to a seven-point scale with appropriately labeled endpoints. In multiple presentation conditions, this response then generated presentation of a new processing goal and the procedure was repeated. The evaluation features (and the rating participants were asked to make) were: sound

---

[7] This was done to control for any possible effects of lateral organization on persuasiveness. Previous studies (Drake, 1988, 1981; Drake & Bingham, 1985) suggest that presentation to the left cerebral hemisphere of right-handers increases resistance whereas presentation to their right hemisphere decreases resistance, with the reverse being true for left-handers.

quality (*poor-good*); pitch of the voice (*very low-very high*); pace at which the message was read (*very slow-very fast*); clarity of pronunciation (*very bad-very good*) and eloquence of expression (*very dull-very vivid*). Except for those in the no repetition condition, participants listened to the message and made judgments 1, 2, or 4 times. Each processing goal was presented an equal number of times at each repetition level (the order in which goals were presented was kept constant).

Dependent Measures

All participants (including those in the no repetition condition) then read a written version of the strong or weak message presented on the computer screen. They indicated the extent of their agreement with the idea that the government should impose the controls in question by using the key pad to respond to a 7-point scale anchored at the low end by "strongly disagree" and at the high end by "strongly agree". Participants then completed an unrelated study, at the end of which they responded to a "post-experimental questionnaire" that gauged how aware participants were of the hypothesis under investigation.

To summarize, in this experiment participants indicated their agreement with a strong or weak counter-attitudinal message after hearing the message repeated 0, 1, 2 or 4 times in the course of making unrelated judgments about superficial message features.

Results and Discussion

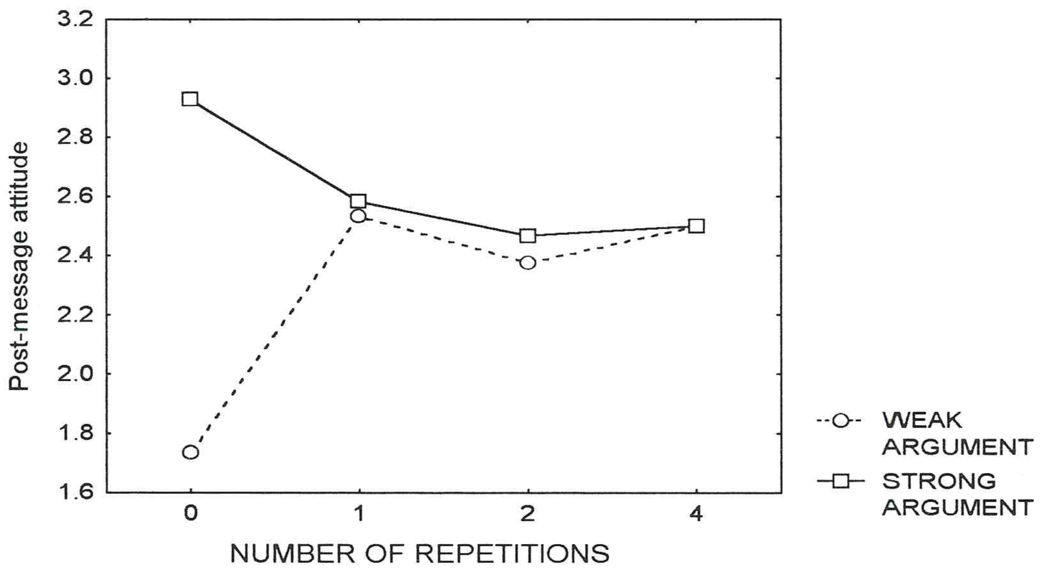
One subject guessed the hypothesis in the post-experimental questionnaire and her responses were excluded from further analysis. Preliminary analyses indicated that the different processing goals used to manipulate familiarity did not differ and analyses reported here collapsed across this aspect of counterbalancing. Attitude scores were reversed so that high scores indicate greater acceptance of the advocated position (see Appendix 3.2 for original means).

Table 5.4: Attitude judgments (Reversed Means, Standard Deviations and sample size), Experiment 3.

	WEAK			STRONG		
	Mean	Standard Deviation	N	Mean	Standard Deviation	N
Control (no-repetition)	1.73	1.33	15	2.93	1.82	14
One repetition	2.53	1.13	15	2.58	1.38	12
Two repetitions	2.38	1.90	16	2.47	1.18	15
Four repetitions	2.50	1.79	16	2.50	1.60	16

To test the hypothesis that familiarity, like positive mood, promotes non-analytic superficial processing, three orthogonal contrasts defined by the Helmet contrast matrix (Kirk, 1982) were computed. The first component of this partition of the variation assumed differentiation of responses to strong and weak arguments in the no repetition condition and no such differentiation in conditions in which repetition occurred (contrast weights were -3, 3, 1, -1,1, -1,1, -1). The contrast was indeed significant, indicating that participants in the no repetition condition exhibited greater elaboration than participants in conditions in which repetition occurred, $t(111) = 1.74$, $p < .043$, $MSe = 1.54$, see Figure 2. This difference explained 99.3% of the joint effect of the two factors. Thus, it was not expected any differential effects on attitude change in either of the other conditions. In fact neither the second (0, 0, -2, 2, 1, -1, 1, -1) nor the third (0, 0, 0, 0, -1, 1, 1, -1) components of the Helmet matrix were significant ($F<1$).These results suggested that even low levels of familiarity (one repetition only) eliminated the differential impact of strong and weak messages on attitudes (see Figure 5.2).

Figure 5.2: Post-message attitudes as a function of message repetition and argument quality, Experiment 3.



To ensure that repetition caused participants neither to read the messages with less attention nor to consider their attitudinal judgment less carefully, message reading time and attitude judgment latency (log latencies) across conditions were compared. The results of a 2 (message quality) x 4 (number of repetitions) ANOVA indicated that the weak message was read more quickly (M= 59secs) across conditions than the strong message ($\underline{M}$= 70secs; $\underline{t}(111)=2.64$, $\underline{p}<.01$), as might be expected given the relative length of the messages. No other effects were obtained for either dependent variable (see Appendix 3.2). Thus, the differences in attitude caused by repetition did not seem readily attributable to any other processing mediator.

These results were strongly consistent with the hypothesis in study. The feeling that the message is familiar, like a manipulation of a positive mood state, was expected to reduce elaboration that would otherwise produce differentiation between a strong and weak message. It apparently did so, as participants for whom the message had been repeated failed to show attitude responses that differentiated strong and weak arguments as did participants in the no repetition condition. The results suggest that in this situation even a single repetition was sufficient to make the stimulus seem "familiar enough" (that is, the familiarity threshold was very low). Thus even those who received a single repetition of the message showed no differentiation between strong and weak arguments, and further repetitions did not change these results. Of course, a stronger activation of the feeling of familiarity (a higher threshold) might be required to trigger top-down processing in more highly involving or demanding situations.

At first glance, the results of this experiment appear inconsistent with an earlier study in which message repetition was also manipulated (Cacioppo & Petty, 1989). Cacioppo and Petty asked participants to evaluate the sound quality of a tape prepared for possible broadcast in the university community. Participants listened to either strong or weak versions of a message regarding the issue of comprehensive exams. Half the participants heard the message once and other half heard it three times in succession. Participants were told that their attitudes toward the issue might affect their judgments and were thus asked to indicate their position on the issue before expressing their opinion of the sound quality. Under these conditions, repetition apparently led to greater elaborative and analytic processing of the message, so that repetition increased the differential persuasive impact of strong relative to weak messages.

However, a number of important procedural differences distinguish the present study from this earlier one and may account for the different attitudinal outcomes. First, Cacioppo and Petty studied an issue highly relevant to their college participants (comprehensive exams) and told them that their attitude judgments could have an important impact on university policy, no doubt inducing a high degree of motivation (Johnson & Eagly, 1989). In contrast, in this study an issue of only moderate importance was chosen , and participants made judgments that they thought were mere pre-testing of stimulus materials for a future study. Second, because the non-semantic goal of evaluating sound quality could easily be achieved after a single exposure to the message, Cacioppo and Petty's highly motivated participants may have been able to devote more capacity to processing and evaluating the implications of argument content. In contrast, in this study participants were given a different superficial aspect of the message to evaluate each time they were exposed to it. Third, Cacioppo and Petty (1989) repeated their message in close succession[8]. Because the message was in all likelihood still in working memory the second and third time it was presented, participants may have had no activation of "feeling of familiarity". Since the feeling of familiarity depends on a match between input and an activated memory trace, it may be that this "match" is never felt if the repetition of the message is "massed," or re-occurs in close succession. Perhaps even more important, this "match " was not present when participants were asked to report their judgments

---

[8] Massed repetition is known to have a different effect than repetition that is spaced in time. This outcome has been obtained in a wide variety of memory tasks, using several dependent measures, but none of the current explanations for it enjoys general consensus (see Hintzman, 1974, for a review).

immediately after listening to the arguments. The difference between these results and the findings presented here suggest that repetition can have different effects on message processing and consequently different effects on attitudes. Message repetitions that are sequential appear to give participants more capacity for elaboration. Message repetitions that are spaced can apparently induce feelings of familiarity that decrease, rather than increase elaboration. Depending on whether analytic or non-analytic processing is induced by repetition, prior attitudes and message characteristics will have different impacts on attitude judgments.

Although the data were consistent with the prediction that familiarity, like positive mood, would lead individuals to engage in non-analytic processing, it seemed useful to replicate this effect and eliminate a possible alternate explanation before drawing firm conclusions. Recall that to manipulate familiarity, participants were asked to make one or more non-semantic judgments of the material in the persuasive message. Only superficial processing of the material was necessary to make those judgments. Inadvertently, then, the procedure could have induced "procedural priming" or "transfer of appropriate processing" (Roediger & Blaxton, 1987; Smith & Branscombe, 1987). The way in which participants were led to deal with the material to make the non-attitudinal judgments may thus have primed superficial processing of the attitudinal judgments. Such an explanation is made less viable by the fact that transfer of appropriate processing typically depends on the overlap between the priming and the target task (Smith & Branscombe, 1987). In this experiment participants were explicitly instructed to attend to the text in order to be able to form an opinion after having been focused earlier on surface characteristics of the message. Nevertheless, it seemed convenient to eliminate this possible alternate explanation for the third experiment findings.

Experiment 4

The impact of familiarity on mood and persuasive processing mode

To do an experiment that intended to manipulate familiarity by message repetition but also ensure that any procedure that might be primed during repetition would be analytic rather than superficial, was designed. As in Experiment 3, strong and weak versions of the target message were presented aurally during the first, repetition, phase, and in written form when participants later make their attitudinal judgments. During the repetition phase, some participants were instructed to listen to the tape recorded target message "as background noise in the environment" while concentrating on reading and forming an opinion about strong or weak versions of a completely different message presented simultaneously on the computer screen. Given the careful distinction made between the main (form an opinion) task and the secondary (just listen) task, participants were expected to differentiate between strong and weak versions of the written message in this phase (Eagly & Chaiken, 1993). Thus repetition occurred without participants being focused on it, and the type of processing that was primed was the kind of elaborative processing that would make more likely attitudinal differentiation of strong and weak messages. Following the repetition phase, the target message was presented on the computer screen and participants are asked to form an opinion regarding it. Then a measure of both reports of affective state and attitudinal judgments was collected.

From the procedural priming or transfer of appropriate processing perspective, then, the elaborative mode of processing primed during the repetition phase should be transferred to the attitude judgment phase. Attitudes toward the target message should then be even more likely to reflect the differential impact of the strong and weak versions of the message. In contrast, the mood-as-regulation-mechanism hypothesis predicted that participants made familiar with the message during the repetition phase would not elaborate on its content when asked to form an opinion on the issue. In addition, the mood-as-regulation-mechanism hypothesis predicted that familiarity should influence subjective mood. If repetition promotes a warm feeling of familiarity with the message, participants who have heard the message repeated should report more positive moods than should those for whom the message is not familiar, replicating Experiment 1.

Method

Participants and Design

Participants were 203 UCSB students (142 females and 61 males). Participants were paid $10 for their participation. Participants were randomly assigned to one of the 16 different conditions that resulted from a 2 (weak or strong priming message) x 2 (weak or strong target message) x 2 (repetition or no repetition of target message) x 2 (attitude or mood measure assessed first) between participants design.

Procedure

Assessment of initial attitudes. Groups of 3-6 participants per session were told that they would be involved in "a study that focuses on the consequences on performance of doing two tasks at once," instructions for which would be presented at the appropriate time by computers. Participants were then seated individually in visually isolated booths, where IBM-PCs presented all experimental material and instructions (see Appendix 4.1.1). Using the cover story that some extraneous variables needed to be controlled in the study, the experimenter asked participants to complete two questionnaires. The first set of questions requested demographic characteristics (gender, class, age, deafness or difficulty in hearing) and the second questionnaire assessed opinions and feelings about several attitude issues. Participants were instructed in the use of a feeling thermometer as follows:

> *Like a regular thermometer, a feeling thermometer measures everything from cold to hot. You can use the feeling thermometer to show how "cold" or "hot" you feel about various things. If you disagree or dislike something, you can give it a "cold" rating, choosing a temperature somewhere between 0 and 49. On the other hand, if you like or agree with something you can give it a "hot" rating somewhere between 51 and 100.*

Participants then used the "thermometer" to express their feeling towards several statements. The two statements relevant to the issues used in this experiment were: "The government should impose controls on industry to help minimize the effect of acid rain in US" (the target issue) and "Weight Loss Centers are places where people can safely and effectively lose weight" (the issue used in the priming phase).

Presentation of priming message and manipulation of repetition. Further instructions then informed participants that there were two different conditions in the study. In one condition, participants would perform the two tasks simultaneously (the repetition condition), whereas in the other condition participants would perform the two tasks sequentially (the no repetition condition). The computer randomly assigned participants to condition, and the computer-presented instructions then diverged by condition. Participants in the repetition condition were told:

> *"You will be given two tasks: a reading task and a listening task. Your main, first, and most important task is the reading one. That is the task we want you to attend to. It is your task. The hearing task is your secondary task, and simulates your environment. We expect you to listen to it, but you should not be concerned with it. Do not in any case interrupt your reading to attend to the tape-recorded message. Remember that your main task is the reading task. Now please put on the headphones and press the 'play' button on the tape recorder to start your listening task and the space bar on your computer to start your reading task."*

Participants in the no repetition condition read only the part of the instructions that urged them to read the presented message carefully.

All participants were then presented with a strong or weak message arguing the benefits of commercial weight loss centers (see Rosselli, Skelly, & Mackie, 1995 for details regarding the characteristics of these messages). Pretesting indicated that these messages were highly likely to be counter-attitudinal to the vast majority of UCSB students. In addition, participants in the repetition condition heard at the same time a strong or weak version of counter-attitudinal message regarding acid rain used in Experiment 3. The acid rain messages were designed to be slightly briefer than the weight loss messages (see Appendix 4.1.2).

Attitudes toward priming issue. Immediately following presentation of weight loss center message participants' attitudes about weight loss centers were assessed with three related items presented on successive screens: *Weight loss centers are places where people can safely lose weight; Weight loss centers offer good support to those who want to lose weight; weight loss centers do not offer ways of efficiently losing weight.* The feeling thermometer that participants used to express their opinions accompanied these items. Thus attitudes regarding the weight loss priming issue were assessed after participants had read either a strong or weak message either alone or in the presence of another (the target) message.

Presentation of target message and manipulation of argument quality. A strong or weak version of the target acid rain message was then presented on the screen. Participants in the no repetition condition regarded the careful reading of this message and expression of opinions about it as the second part of their sequential task. Participants in the repetition condition were told that some of them (in fact all of them) had been selected to give their opinions regarding the issue presented as background noise: they were to read the message presented on the screen carefully and express their opinion on it.

Dependent measures

After carefully reading the acid rain message, participants completed attitudinal and mood measures. One half of the participants first expressed their attitude on the acid rain issue using the feeling thermometer and then responded to a mood assessment. Two 9-point scales assessed mood. The first asked, "*How do you feel right now?*" and participants responded on a scale anchored with sad at the low end and happy at the high end. The second item asked participants *"How would you describe your mood at this time?"* and was accompanied by a scale anchored with "*bad*" at the low end and "*good*" at the high end. The other half of the participants responded first to the mood assessments and then expressed their opinions regarding the acid rain issue.

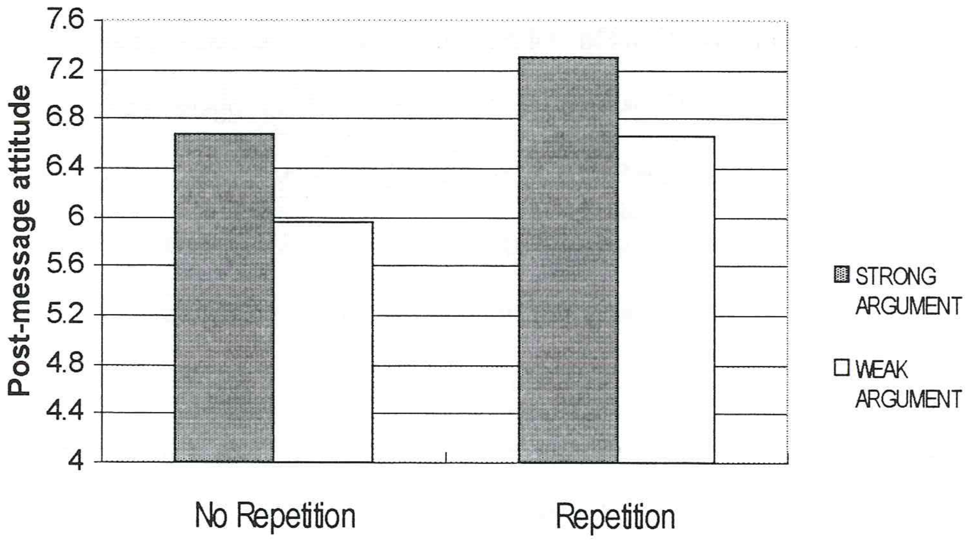
All participants returned to a reception room where they completed a small survey about their experiences and were then debriefed, paid, and thanked for their participation.

Results and Discussion

A computer malfunction during three participants' data collection and the elimination of seven participants who were familiar with the persuasive aims of the study led to final analysis of data from 193 participants (4 participants were lost from the no repetition condition and 6 from the repetition condition). The fact that some participants failed to use an appropriate response key produced some missing values, explaining the variation in reported degrees of freedom. To simplify data presentation all thermometer-based attitude measures were re-scaled to a 0-10 scale. An initial analysis revealed that as expected both priming and target issues messages were counterattitudinal. Participants were initially equally opposed to weight loss centers in the no-repetition ($M = 4.38$) and repetition ($M = 4.75$) conditions, and favored mandatory government control of acid rain equally in the no-repetition ($M = 8.16$) and repetition ($M = 7.81$) conditions. Target issue attitude responses were reversed so that higher scores reflected greater agreement with the advocated position (see Appendix 4.2.1, for original data)

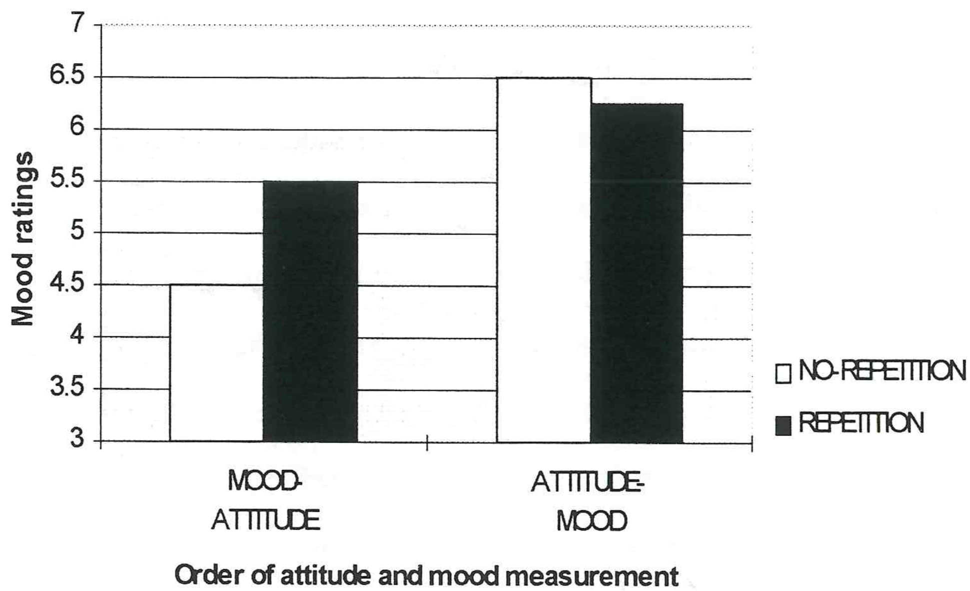
Attitudes on the priming issue. Given that instructions stressed the importance of attending carefully to message content, participants were expected in both the repetition and no repetition conditions to process the information about the weight loss issue systematically, and thus to show similar differentiation of attitudes following strong and weak arguments. To test this hypothesis a 2 (strong or weak message quality) x 2 (repetition or no repetition) ANCOVA was performed on the average of the three items measuring attitudes toward weight loss centers (Cronbach's alpha = .69; confirmatory factor analysis revealed a single factor solution that explained more than 62% of the total variance) with initial attitudes on the issue as a covariate (see Appendix 4.2.1.). The impact of the covariate was significant, F (1,188) = 81.50, $p<.0001$, MSe = 1.84. As predicted, participants reacted differently to strong and weak versions of the persuasive message, F (1,188)=11.79, $p<.0007$, MSe = 1.85. Participants agreed with the issue more after exposure to the strong message (M=6.99) than exposure to the weak version (M= 6.31). The lack of a significant interaction (F<1) between level of repetition and argument quality suggested that all participants processed the message systematically, see Figure 5.3. This analysis also revealed a main effect, F(1,188)=10.06, $p<.002$, indicating that participants agreed more with the message when they performed a simultaneous task (M=6.96) than when they did not (M= 6.33).

Figure 5.3: Post-message attitudes towards the priming issue (adjusted for initial attitudes) as a function of message repetition and argument quality, Experiment 4.



Mood assessment. Responses regarding participants' feelings (sad-happy) and their moods (bad-good) were highly correlated (r= .72) and were averaged to form a mood index (preliminary examination revealed an extreme outlier which was removed from further analyses, N=192). From the perspective of the mood-as- regulation hypothesis, repetition of the acid rain message should influence participants' feelings that it was familiar and thus should influence their mood. It was thus expected that those in the repetition condition would report more positive moods than those in the no repetition condition. However, this pattern was expected only when mood was assessed immediately after reading the target message. When mood was measured after attitude judgments were made, it was expected that the feeling of familiarity may have dissipated and that attitude responses might influence mood ratings. To test the hypothesis, the mood index was entered in a 2 (weak or strong argument quality) x 2 (repetition or no repetition) x 2 (order of measurements) between subjects ANOVA (see Appendix 4.2.2.). The results were consistent with expectations. As predicted, repetition interacted with the order in which attitudes and mood were assessed, $\underline{F}$ $(1,183)=9.57$, $\underline{p}<.002$, $\underline{MSe} = 1.97$. Repetition improved mood ratings ($\underline{M}= 5.51$) compared to no repetition ($M = 4.51$) only when mood was measured before attitudes were, $\underline{t}$ $(183)= 3.54$, $\underline{p}<.0001$. When mood was measured after attitudes the differences were not significant, $\underline{M}=6.24$ and $\underline{M}=6.49$, $t < 1$. The order of assessment also influenced participants' overall feelings, $\underline{F}(1,183)=44.88$, $\underline{p}<.0001$. Expressing attitudes seemed to promote positive feelings in all participants ($\underline{M}=6.37$) compared to when mood was measured before attitudes ($\underline{M}= 5.01$), see Figure 5.4. These results were compatible with the idea that task completion induces positive feelings (Simon, 1969; Wyer & Srull, 1989).

Figure 5.4: Mood ratings as a function of repetition and order of assessment, Experiment 4.



Attitudes on the target issue. The three items used to measured participants' attitudes towards the acid rain issue were correlated (Cronbach's alpha = .65) and shared a unique factor structure that accounted for slightly more than 60% of the total variance. These three items were averaged to form a single post-message attitude index.

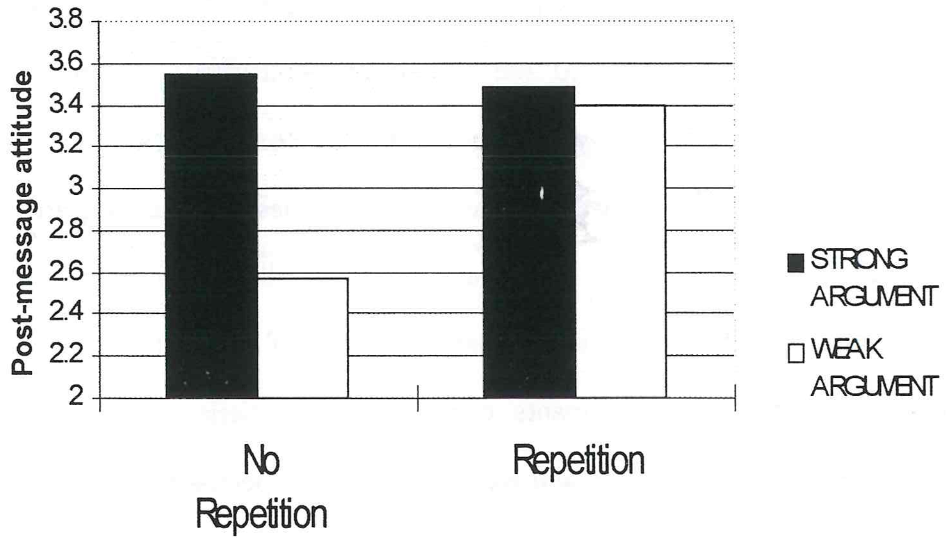
This study primary hypothesis was that participants for whom the target message was familiar (because it had been repeated) would fail to process it in as analytic fashion as would those participants for whom it was not familiar (those who only read the message). Thus participants were expected in the no repetition condition to demonstrate attitude that reflected the strength and weakness of the arguments of the target message they heard, whereas participants in the repetition condition were not expected to show this pattern. To test this hypothesis post message attitude index scores were entered into an ANCOVA defined by a 2 (strong or weak argument strength) x 2 (repetition or no repetition) x 2 (order of attitude and mood measurement) factorial with initial attitude on the target issue as a covariate (see Appendix 4.2.3).

As expected, initial attitudes were related to participants' post-message attitudes, $\underline{F}(1,180)=24.69$, $\underline{p}<.0001$, $\underline{MSe} = 2.19$. However, further analysis to assess the impact of the covariate on other factors indicated that the strength of this relation differed depending on whether participants were familiar or unfamiliar with the message, producing an interaction with the repetition variable, $\underline{F}$ $(1,179)=7.23$,

$p<.007$, MSe = 2.11. Participants' post-message attitudes were related more strongly to their previously reported attitudes (Beta = .502; $t(96)=5.69$, $p<.0001$) in the no-repetition condition than in the repetition condition (Beta = .164; $t(83)= 1.52$, $p<.13$).

This pattern of results corroborates the main hypothesis that participants experiencing a feeling of familiarity and those not experiencing a feeling of familiarity engaged in different modes of processing information. However, because the two regression lines were not parallel, the probability values associated with rejection of the Ho assumed in the ANCOVA model may be either over or under-estimated, and the data must be interpreted with this in mind. The pattern of results suggested the presence of a main effect of argument quality, $F(1,180)=6.08$, $p<0.014$, MSe = 2.19, qualified by an interaction with familiarity, $F(1,180)=3.87$, $p<.05$, see Figure 5.5. A planned contrast indicated that participants in the repetition condition seemed not to react differently to the presence of strong (Adjusted M=3.49) or weak (Adjusted M = 3.38) messages, $t(180) <1$. Thus the main effect of argument quality was due primarily to the fact that no-repetition participants were much more persuaded by the strong message (Adjusted M=3.53) than by the weak message (Adjusted M=2.57), $t(180)= 3.24$, $p<0.001$. In addition, participants in the no repetition condition tended to agree less with the advocated position (Adjusted M= 3.05) than participants in the repetition condition (Adjusted M= 3.44), $F(1,180) =3.17$, $p<.08$.

Figure 5.5: Post-message attitudes towards the target issue (adjusted for initial attitudes) as a function of message repetition and argument quality, Experiment 4.



Latency measures. Reading and reaction times were analyzed to test additional hypotheses. First, participants in the repetition condition (who heard the target message while reading the priming message) were expected to take longer to read the priming message than those in the non-repetition condition, who had no dual task. Participants in the repetition condition took an average of 3.31 minutes to read the weight loss message compared to participants in the no repetition condition, who took 2.80 minutes, confirming the hypothesis, $F(1,188)=16.165$, $p<0.0001$, $MSe = .789$. Since participants in the repetition conditions had already been exposed to the target issues, they were expected to process the target message more quickly than those in the no repetition condition. This expectation was confirmed, $F(1,188)= 4.57$, $p<.034$, $MSe = .098$. Examination of the means indicated that the repetition group were indeed faster (M=1.04) than the no repetition groups (M = 1.14). The magnitude of the difference does not suggest that the repetition group skipped reading the message altogether, but merely that they were faster. The two groups of participants did not differ in their latencies to express their attitudes ($F<1$).

The results of this study provided further support for the idea that feelings of positive mood are integral to the feeling of familiarity. As in Experiment 1, participants in the familiarity condition reported feeling better than those in the condition where familiarity was not experienced. These results replicated despite the fact that in this experiment participants reported their feelings immediately after exposure to the information, rather than at the end of the study, as in Experiment 1. As in Experiment 3, participants experiencing familiarity showed no attitudinal differentiation between strong and weak versions of a persuasive message, suggesting that familiarity, like positive mood, is associated with a more superficial, non analytic mode of processing. In addition, the design of Experiment 4 eliminated the alternate explanation of this finding based on procedural priming effects.

General Discussion

The four studies presented above were developed to empirically test the hypothesis of an integral relationship between the feeling of familiarity and of positive mood. The hypothesis states that mood is a subjective feeling that reflects the implicit feeling of familiarity associated with the regulation of information processing. Mood was, thus, expected to be closely related to the feeling of familiarity: manipulations of one were expected to trigger changes in the perception of the other. Because of their definitional and experiential equivalence, mood and the feeling of implicit familiarity were expected to have parallel effects on information processing. The results corroborated these expectations.

In the first study, manipulations of the feeling of familiarity were shown to influence self-reported affective state, such that the experience of familiarity was accompanied by the experience of positive mood. This effect was replicated in Experiment 4. Experiment 2 demonstrated that a positive mood induction produced the same effects on validity judgments as do manipulations of the feeling of familiarity, suggesting that the feelings associated with a positive mood were understood as familiarity. Together both these studies suggest that the positive feeling we call mood and the positive feeling we call familiarity are, if not identical, very similar and thus easily able to be confounded.

The results of the third and fourth studies provided strong evidence that the experience of familiarity produces effects in the persuasion domain that parallel those found when positive mood is induced. Experiment 3 showed, for example, that participants dealing with familiar persuasive information processed it superficially, just as participants in positive moods process persuasive messages superficially. The fourth study replicated this effect while eliminating an alternate explanation based on procedural priming.

In supporting the contention that positive affect is integral to the feeling of familiarity, and that this feeling induces parallel effects to the MIPE, these findings support the idea that positive affect, because of identity with familiarity, acts as an information processing regulation mechanism. These experiments thus corroborate the idea that mood manipulations may induce a MIPE because the affect they induce is confounded, or interferes, with this mechanism of regulation.

As stated in discussing the results of each study, some of the data can be explained by other theoretical approaches. However, none of those approaches seems able to account for the picture painted by all four studies. None of the alternative theoretical approaches to mood and its effects relate mood to the feeling of familiarity and none of them frame familiarity as impacting mode of processing. Conversely, theoretical approaches to the impact of familiarity on processing have not stressed its relation with the feeling we called mood. Given this situation, in order to be able to account for these results any previous explanation of the MIPE would have to add to its theoretical architecture an assumption with regard to the relation between mood and familiarity and an assumption stressing the impact of familiarity on processing. Chapter VI discuss these issues.

The four experiments reported here were designed to allow for a falsification of the central tenets of the mood-as-regulation mechanism hypothesis, and thus for a undermining of the approach as a viable account for the MIPE. Instead, the empirical results provided by these experiments contribute considerable support for the mood-as-regulation-mechanism hypothesis as a new and integrative account of a finding that has long remained without consensual explanation in the social psychological literature.

This is not to say that the results of these experiments definitively establish the mood-as-regulation-mechanism hypothesis as the only or the most viable explanation of the effect. Before it can be established as a demonstrably better explanation of the effect than alternatives, further empirical testing, especially of conflicting hypotheses that can be derived from this and alternate accounts, needs to occur. Many of these extensional tests are proposed in the next chapter, testifying to the power of the hypothesis to generate empirically testable predictions that allow for strong inference among competing theoretical approaches (Plat, 1964). The empirical evidence generated by these four studies provides the first crucial test of the adequacy of the hypothesis, a test which the mood-as-regulation-mechanism hypothesis weathered well. Data from the experiments clearly support the unique predictions made by this approach. Not only can mood and familiarity be experienced as equivalent feelings, but they exert an equivalent regulatory influence on information processing.

CHAPTER VI:

Current state of the mood-as-regulation-mechanism hypothesis

Prospects for the future

As a rule, people in positive moods do not engage in a deep, systematic and analytic processing of information. Social psychologists have observed this phenomenon in a number of domains, but have not agreed on its explanation (see Chapter I). In the cognitive domain, theorists have argued that the implicit experience of familiarity also triggers non-analytic processing. Moreover, some of these approaches argue that this feeling regulates information processing by engaging individuals in this mode of processing. Lack of familiarity would then be associated with more analytic processing. Given that this feeling of familiarity has been characterized as positive in tone, it was suggested that the experience of positive affect is an integral part of this feeling of familiarity. This integral relation of feelings suggested that mood, as a low intensity, pervasive, diffuse, and valenced feeling, constitutes a process regulation mechanism. Positive affect's cue value as a signal of familiarity was thus presented as an explanation of why positive mood often triggers non-analytic processing (the MIPE). This explanation encompasses the possibility that mood induced by sources other than familiarity might be misinterpreted as an implicit feeling of familiarity, that is, induced mood might be (mis)attributed to familiarity.

After raising the mood-as-regulation-mechanism hypothesis as an alternative explanation for the MIPE (Chapter I), this dissertation tried to provide evidence for assuming such a feeling as the mechanism that regulates processing. Chapter II made the case that a regulation mechanism is needed by documenting that information may be processed in two distinctive ways, analytically and non-analytically. Supporting this need, different theoretical accounts of both cognitive and social phenomena postulate some regulatory mechanism. Moreover, this mechanism is generally understood to be a "feeling with a positive tone": familiarity.

Chapter III assessed the extent to which the characteristics of the feeling typically called mood fit those of a regulation variable. Like familiarity, mood was shown to be a valenced, low intensity, diffuse, and pervasive feeling, that is systematically associated with the two modes of processing. Mood is always present (although it changes in valence and intensity). Because it is low in intensity, it is not disruptive of processing. Its diffuseness seems to arise from the non-conscious nature of its source. These characteristics are consistent with the assumption that mood as a regulation mechanism.

Chapter IV took as foundational the assumptions that processing is dualistic, that a process regulation mechanism is necessary, and that familiarity plays an important regulatory role. It defined as unique and distinctive assumptions of the mood-as-regulation-mechanism hypothesis the ideas that positive affect is integral to implicit familiarity, that implicit familiarity can be consciously experienced as mood, and that mood arising from sources other than familiarity may be (mis)interpreted as an implicit feeling of familiarity. From these assumptions a set of predictions that are central to the mood-as-regulation-mechanism hypothesis were derived: manipulations of familiarity should promote positive affect, manipulations of mood should be (mis)interpreted as implicit familiarity, and manipulations of familiarity should be associated with a FIPE (Familiarity Information Processing Effect) that completely parallels the MIPE (Mood Information Processing Effect).

Results of four studies presented in Chapter V corroborated the three unique assumptions previously described. The first and second studies showed that manipulations of the implicit feeling of familiarity induced more positive ratings of mood and that induced positive affect had an effect typically associated with manipulations of implicit familiarity. In support of the idea that the positive affect integral to the feeling of familiarity is what drives the MIPE, the results of the third and fourth studies suggested a FIPE that parallels the frequently found MIPE within a persuasion setting. Thus, together, the results of the four studies offered consistent support for the mood-as-regulation-mechanism hypothesis.

The general conclusion that can be drawn from this dissertation is that *the mood-as-regulation-mechanism hypothesis is a viable explanation for the MIPE*. What is the status of this viable account vis-à-vis the current literature? What are its prospects for the future? These are two questions to which I will now turn.

What is the status of the mood-as-regulation-mechanism hypothesis?

As a theoretical model of information processing

The mood-as-regulation-mechanism hypothesis encompasses the idea that the mind (cognition) cannot function without a heart (feelings). The way in which information is processed basically depends upon how that information *feels* (more or less positive). Two major theoretical frameworks also suggest that the heart may have an important role in the mind functioning.

Affect as regulation framework

The idea that affect can have a role in regulating the cognitive system is far from new. Herbert Simon (1967), for example, suggested that in order for the cognitive system to be a "smart machine", it must have both motivation and emotion. Motivation controls information processing by initiating a routine that then runs through to completion. This routine is completed by a set of subroutines. Emotion informs the system that a particular subroutine can be terminated and control must return. Emotion is a mechanism that regulates information processing since it monitors when the process should be *interrupted*, and does so.

Two other examples of approaches that stress affect as a regulator of cognition are the works of Carver and Scheier (1990a, 1990b) and Oatley and Johnson-Laird (1987). Both these sets of authors view emotion as part of the system that *monitors progress towards goals*, but they differ as to how they conceptualize the nature of the role emotion plays. Carver and Scheier, in line with Simon, see emotion as deriving from the rate of changes that occur as processing progresses. If affect continues to be negative, more action will be generated. Positive feelings signal achievement of a goal and so *stop* system activity. Oatley and Johnson-Laird, in turn, see emotion as arising independently of goal attainment itself. Emotion is caused by any event that informs the processor about whether the probability of goal attainment is high or low. Thus positive emotion, instead of stopping action, *engages the processor in what he or she is doing* and encourages the current action.

With a neuropsychological focus on the hardware of cognitive processes, António Damasio (1994) suggests that feelings (even in the absence of a phenomenal experience) can be "somatic-markers" that have a very specific control over the decisional processes that underlie behavior and task performance. Somatic-markers encompass integral changes of body state upon which the mind depends. This dependence arises from the fact that somatic-markers constitute unconscious bodily signals as to the positivity or negativity of the situation and of each possible action. The mind is tuned to these signals so as to avoid negative outcomes and seek positive ones.

The mood-as-a-regulation-mechanism hypothesis, although sharing some aspects in common with these approaches, differs from each of them in some relevant aspects as well. First, contrary to all these approaches, the mood-as-regulation-mechanism hypothesis assumes that mood, and not emotions, has a regulatory role. It considers the definitional qualities of mood as favoring it as a regulatory mechanism (see Chapter III) rather than the characteristics of emotions favoring them. Second, in opposition to most of these approaches but in line with what is proposed by Oatley and Johnson-Laird (1987), the mood-as-regulation-mechanism hypothesis suggests that the regulatory feeling plays its role by activating processes rather than ending them. The mood-as-regulation-mechanism hypothesis also differs from other approaches in the informational role it gives feelings. Oatley and Johnson-Laird see feelings as informing the system about the progress toward goals, whereas the mood-as-regulation-mechanism hypothesis sees feelings as reflecting a match between the current focal information and memory. In addition, none of the theoretical frameworks presented above considers regulation to be concerned with activation of analytic versus non-analytic modes of information processing.

Feelings-as-information theoretical frameworks

Although not stressing feelings as having a "regulatory function," approaches that focus on feelings-as-information also frame processing as dependent on affect. Regulatory approaches understand processing as implying changes in feelings and feelings as promoting changes in processing. Informational approaches understand feelings as equivalent to tactual, visual, olfactory, and auditory sensations which provide the cognitive system with current information about its actual circumstances. Thus feelings impact processing because their informative value is integrated in processing as is other information received by the different sensory organs. Examples of approaches developed within this framework are the work developed by Schwarz and collegues (Schwarz, 1990; Schwarz & Bless, 1991; Schwarz et al., 1991); by Morris (1989, 1992); by Clore and colleagues (Clore, 1992; Clore & Parrott, 1994; Schwarz & Clore, 1996); and by Martin and colleagues (Martin, Achee, Wards, & Harlow, 1993; Martin, Wards, Achee, & Wyer, 1993; Martin & Stoner, 1996).

- Schwarz and colleagues suggest that affective feelings inform us about the nature of our current psychological situation: negative affect signals that the current situation is problematic and positive affect that the current situation is benign. This information is expected to impact processing by impacting individuals' degree of motivation to process information more deeply (the cognitive tuning hypothesis).

- Morris' perspective is that mood provides the cognitive system with information that is distinct from information provided by other affective states, such as emotions. Emotion provides information about the system's external environment and mood about its internal environment. Mood provides the self-regulatory system with information about the resources that are available to meet environmental demands.

- Clore and colleagues differentiate among affective, cognitive, and bodily feelings, and believe that all these types of feelings provide the system with information regarding each of their subsystems. Those feelings, of which the processor is consciously aware, are understood as summarizing a myriad of complex details about the current state and are critical ingredients in decision-making and other cognitive activities involving reflection.

- Martin and colleagues do not consider mood as providing information about general issues, such as the nature of environment, or availability of resources to meet environment demands. Mood's informational value is contingent upon the specific situation. Depending on what the relevant question is (e.g., How satisfied am I?; How much am I enjoying this task?; Have I done enough? or Is it time to stop this behavior?), mood state may favor one or another response. This affective information has to be accessed in order to play a role in processing.

By assuming that mood has a regulatory role the mood-as-regulation-mechanism hypothesis distants itself from merely informational approaches. The regulation hypothesis does not consider feelings informative of any general or specific characteristic of the current situation that must be taken into account in processing. From a regulatory perspective, mood is a mechanism that is integral to the information processing system. Because of that mood not only promotes changes in processing but is also expected to suffer changes in the course of processing. That is, as mood arises from matching, and as matching is a continuous process, every time perceived familiarity changes so too might experienced mood (even if those changes do not imply exceeding the threshold and so do not have procedural implications). However, the regulatory framework does not imply that mood does not have an informational role. If any informational role is to be attributed to mood as it is understood by the mood-as-regulation-mechanism hypothesis, it is that positive mood informs the system that the situation is known, one with which it has dealt in the past, and thus that the system knows how to deal with it now.

In sum, the mood-as-a-regulation mechanism hypothesis suggests that a feeling regulates the cognitive system. By doing so it stresses that our feelings have a more relevant role in the general information processing system than merely stopping action or than summarizing complex information.

As an account of the MIPE

What is the status of the mood-as-regulation-mechanism hypothesis as an account of the MIPE relevant to previous attempts to explain the phenomenon?

1) The mood-as-regulation-mechanism hypothesis differs from most alternative explanations of the MIPE in assuming that the impact of positive affect on processing is direct, rather than indirect. In this regard, it is most similar to the mood-and-general-knowledge approach (Bless et. al., 1996). It could also be argued to be similar to the affect infusion model (see Forgas, 1994) since it also hypothesizes the existence of a direct impact of mood under certain conditions. However, this latter model also assumes that mood effects are mediated by either motivational or capacity factors under other conditions. The most relevant comparison is thus with the mood-and-general-knowledge approach.

Contrary to other alternative models, both the mood-and-general-knowledge approach and the mood-as-regulation view "feeling good" as inducing more top-down processing and not feeling good as inducing more analytic processing, without recourse to any motivational or cognitive mediation. Mood has an impact on processing merely because individuals experience it. Neither of the models even require such feelings to be consciously accessible. Instead, the impact of feeling on processing is at an implicit, unconscious level. In both approaches the impact of mood manipulations on processing is understood to involve a (mis)interpretation of induced affect and affect naturally associated with the situation.

Despite these similarities, it is difficult to see how predictions and data associated with the mood-as-regulation-mechanism hypothesis could be predicted or explained by the assumptions that are presently associated with the mood-and-general-knowledge approach. To make that possible the mood-and-general-knowledge approach would have to develop a more intrinsic identification with the mood-as-information framework, and some development of further assumptions with regard to the relation between mood and familiarity would have to occur. To be able to explain the results that currently support the mood-as-regulation-mechanism hypothesis, the mood-and-general-knowledge approach would have explicitly to assume that: a) familiarity is able to be confounded with positive mood; b) both feelings can furnish parallel information regarding how benign a situation is, and thus that the processor can rely on general knowledge structures; and c) because of this similar informational role both feelings have parallel effects in how information is processed.

There are also significant differences between the models that will allow for more specific empirical differentiation in future research. First, the models differ regarding the framework of mood as a regulation mechanism or as information with procedural implications. Consistent with the cognitive tuning hypothesis, Bless' approach (Bless, 1994, cited in Bless et al., 1996) assumes that affective states inform individuals about the nature of the current situation: whether the situation is benign and unproblematic, or whether it is characterized by a lack of positive outcomes or by the threat of negative ones. Mood is understood to result from the impact of perceived situational valence and to establish the degree of confidence the individual may have in processing information non-analytically. The regulation hypothesis does not consider feelings informative of the positivity or negativity of the current situation. From this perspective, mood is a variable integral to, and regulatory of, information processing. Instead of being influenced by the valence of the situation it conveys how familiar the situation seems to be. If it has any informational role, positive mood informs the system that the situation is known, one with which it has dealt with in the past, and thus that the system knows how to deal with it now, regardless of whether it is "good" or "bad."

Second, the approaches differ in their characterization of the mechanisms by which cognitive and motivational factors contribute to the MIPE. Instead of arguing that the MIPE "may not always be observable" (Bless, Clore, Schwarz, Golisano, Rabe, & Wolk, 1996, p. 677) because it is overridden by motivational or capacity factors, the regulation view posits a number of ways in which these variables might influence the MIPE.

2) The mood-as-regulation-mechanism hypothesis does not contradict the most relevant predictions associated with the majority of previous attempts to explain the MIPE. It can thus account for most of the empirical evidence associated with previous explanations of the MIPE. The reverse, however, is not true.

- Consistent with all explanatory models, the mood-as-regulation-mechanism hypothesis attributes motivation and capacity a highly important role in processing. However, instead of deeming motivation and capacity influences on the MIPE to be mediational, the regulatory approach sees this role as one of moderation. In addition, and distinct from other approaches, the theoretical framework of the regulatory view suggests two possible ways motivation and capacity can interfere with regulation. First, motivation and capacity factors might promote changes in the definition of the focal stimuli and thus the degree of felt familiarity, which in turn activates more or less analytic processing. In this case motivational and capacity factors, instead of being influenced by how individuals feel (their mood), influence how they feel. Second, motivation and capacity factors might have a direct impact on the level (decision threshold or cutpoint) of familiarity necessary to induce an analytic processing mode.

- The foundational assumption of the capacity view is that positive mood is associated with a higher diversity and amount of information (which tend to be positive) activated in memory (Bower, 1981, 1991; Isen, 1984, 1987). Although not seeing this impact of mood on memory as mediating the MIPE, the regulatory assumptions are consistent with its occurrence. By engaging in top-down processing happy individuals are expected to facilitate memory retrieval processes. They are also prone to more contextual priming influences. Positive feelings may thus facilitate more congruent memory activation. This assumption has also been claimed as an explanation of why happy people seem to be more creative than non-happy people (although this assertion needs further evaluation, as is suggested by the review reported in Chapter III).

- The mood-as-regulation-mechanism hypothesis also agrees with the predictions of the cognitive tuning hypothesis that have been empirically supported. This approach has found empirical support in studies that suggest that motivational factors qualify the MIPE and in studies that suggest that the MIPE involves a (mis)attributional process. The mood-as-regulation-mechanism hypothesis accounts for these two effects. However, it does not predict, as the cognitive tuning approach does, that the MIPE involves a necessary impact of affect on individuals' motivation to process information (challenged by Begg et al.'s 1996 results). Also contrary to the cognitive tuning approach, the regulation approach does not see the perceived danger or safety of the situation as impacting processing. Thus, it does not expect the impact of mood on processing to arise from its informational role regarding these hedonic features of situations.

- In common with the hedonic contingency hypothesis, the regulatory approach does not view the hedonic characteristics of the environment as by themselves determining the feeling which is in turn assumed to impact processing. However, the mood-as-regulation-mechanism hypothesis does not agree with the fundamental assumption of the hedonic view, that mood's impact on processing is contingent on whether individuals think a task is, or will be, pleasant or unpleasant. Such expectations may have some impact in the regulatory view, since hedonic expectations may interfere with the uncertain source and diffuse quality of affect necessary for (mis)interpretations to occur. Happy individuals with positive hedonic expectations expect that the task will make them feel even better (a hard task since they are already happy). Their actual feelings are, thus, unlikely to be (mis)interpreted as implicit familiarity. Happy individuals with negative hedonic expectations expect the task to make them feel bad. Any positivity they feel is thus more likely to be interpreted as implicit familiarity. The fact that the hedonic view does not incorporate a (mis)attribution mechanism makes this alternative explanation of their results currently incompatible with their position (Wegener & Petty, 1994).

In sum, whereas the mood-as-regulation-mechanism hypothesis accounts for the majority of the effects associated with each alternative explanation of the MIPE, the reverse is not true. Only an informational account re-framed by an assumption of mood and familiarity being similarly experienced and having parallel informational roles could account for the results presented in the previous chapter. However, other distinctive points separating the two approaches will make it possible to further contrast their predictions in future studies. The next section will focus on these points of contrast.

Prospect for future productivity and development of the hypothesis

The mood-as-regulation-mechanism hypothesis was conceived with a primary theoretical goal: to offer a new explanation for the MIPE. This new explanation, integrating theoretical developments in the cognitive field with social cognition ones, has three basic novel aspects. First, affect is viewed not as a variable external to the processing system, but instead as one that it regulates it. Second, unconscious processing characteristics may be consciously experienced as a feeling, such as the one we called mood. Third, in certain circumstances induced affect may be confounded with regulatory affect. Empirical support clearly suggests the viability of these novel assumptions.

However empirical testing must be extended in order to prove that besides being a viable account for the MIPE, it is also a better account for that effect. One characteristic of the mood-as-regulation-mechanism hypothesis is its extensive theoretical development. Taken together, its theoretically derived assumptions (described in Chapter IV), the specific points of contrast with alternative explanations just noted, and other related evidence permit the generation of a set of predictions that help differentiate the mood-as-regulation-mechanism hypothesis from other explanatory approaches to the MIPE and that extend the "known effects" of familiarity and mood in the literature.

These predictions can be systematized as follows:

1. The mood-as-regulation-mechanism hypothesis distinguishes itself from alternative explanations of the MIPE by assuming motivation and capacity

factors as impacting processing in two distinct ways, as reflecting distinctive types of factors, and as related with different moderation roles in the MIPE.

- Motivation and capacity factors impact processing, by interfering with the process of regulation, in one of two possible and non-incompatible ways[1]:
  a) Motivation and capacity factors might promote changes in the definition of the focal stimuli and thus in the degree of felt familiarity, which in turn activates more or less analytic processing (see Chapter II).
  b) Motivation and capacity factors might have a direct impact on the level (decision threshold or cutpoint) of familiarity necessary to induce an analytic processing mode (see Chapter II).

- Different motivational factors (see Chapter I) may impact on processing mode via different routes:
  a) Processing goals, by influencing what amount of available capacity is directed to where (Chaiken, Giner-Sorolla, & Chen, 1996; Hamilton, 1981), are expected to impact focal stimulus definition. In doing so they impact degree of matching and thus mode of processing activation.
  b) More general, non-directional motives such as accuracy and least effort (Kruglanski, 1989; 1990; 1996; distal goals; Pittman, 1998), are

[1] These two ways by which motivation impacts processing mode may be illustrated by reference to different parameters of signal detection theory. Processing goals impact the definition of distributions and general non-directional motives influence the criterion.

expected to influence how information is processed, by changing the threshold[2] associated with analytic processing activation.

- The nature of a task (processing goals) impacts processing mode[3].
  a) Tasks that focus attention on the specific features of the stimuli raise the probability that the particular stimulus will not match a memory representation, and thus analytic processing will be triggered.
  b) Tasks that direct attention to more general and abstract features of the stimuli raise the probability of such a match, making non-analytic processing more likely.

- Different motivational factors have different impacts on the MIPE[4]:
  a) Attentional factors related with individuals' current processing goals impact on perceived level of familiarity, and thus make it less likely that mood is confounded with familiarity. Thus, high attention can prevent positive mood having an impact whereas low attention can facilitate that impact.

---

[2] It is not difficult to imagine that the level of familiarity that is established as a threshold may be a personal variable. Past history helps to establish its default value. Moreover, a different value may be assumed to different contexts.

[3] Any task that focuses on the specific features of the stimulus has higher probability of being more deeply processed (Kahneman & Miller, 1986; Sherman, Beike, Ryalls, in press) than one that focuses on general judgments. It is thus logical to expect that individuals will engage in analytic processing when asked to evaluate the quality of an argument (strong versus weak) even if they did not differentiate strong and weak arguments when expressing their general opinion.

[4] Within this framework the pattern of data described by current literature (see Chapter III) as illustrating motivational moderation of the MIPE describes only some of the possible scenarios. Studies have manipulated only two levels of capacity and motivation (low versus moderate or moderate versus high) within conditions where familiarity level was initially near the threshold.

b) Non-directive motives impact on processing by changing the level of threshold for engaging in a different processing mode. In doing so they change the impact that mood being (mis)interpreted as feeling of familiarity may have in processing .

- Instead of impacting motivation and capacity, mood may be impacted by it.

  a) By promoting changes in the definition of the focal stimuli, motivational and capacity factors impact on the degree of implicitly felt familiarity, which is expected to influencing mood ratings.

  b) By promoting changes in level of the threshold associated with analytic processing, motivational factors are not expected to impact mood ratings.

2. Distinctly from other approaches to the MIPE, the mood-as-regulation-mechanism hypothesis expects that, as the true source of the implicit feeling of familiarity, stimulus familiarity qualifies the MIPE. That is:

- Stimulus familiarity may either favor or oppose a (mis)interpretation of previous feelings as implicit familiarity.

  a) If the setting is totally familiar mood is not expected to influence processing, and information will be processed non-analytically.
  b) If the level of familiarity is congruent with positive mood (although not enough to reach the threshold by itself), non-happy individuals will process information analytically whereas happy individuals will engage in non-analytic processing.

c) If the situation is totally unfamiliar (thus incongruent with positive mood) mood is not expected to influence processing, and information will be processed analytically.

3. In opposition to an informational approach, such as the cognitive tuning hypothesis, the mood-as-regulation-mechanism hypothesis does not see the MIPE as driven by mood states that signal the hedonic characteristics of the current situation. Thus:

- Hedonic characteristics of the situations (situation valence) will not impact processing. Even if mood is shown to impact how positively or negatively a situation is perceived, it is neither sufficient nor necessary for observing a MIPE. Perceived hedonic characteristics of the situation are not expected to mediate mood's impact on processing.

4. Contrary to the hedonic contingency hypothesis, the mood-as-regulation-mechanism hypothesis considers that expectations regarding hedonic characteristics of situations impact processing. Thus:

- Hedonic characteristics of situations do not qualify the MIPE. That is, perceived hedonic characteristics of situations are not expected to moderate mood's impact on processing. Thus, happy individuals in a (familiar) negative situation will not necessarily engage in non-analytic processing.
- Expectations regarding the hedonic characteristics of situations, will facilitate mood being confounded with the implicit feeling of familiarity when

confirmation occurs (expected => familiar situation) and will inhibit confounding when disconfirmation occurs. So, expectations regarding hedonic characteristics of the situations are expected to moderate mood's impact on processing.

5. The mood-as-regulation-mechanism hypothesis stresses that the empirical evidence of the MIPE rests on a confounding between induced feelings and implicit feeling of familiarity. (Mis)interpretation of mood to implicit familiarity is necessary for the MIPE to occur. Thus, contrary to all other alternative explanations of the MIPE, the following two predictions can be made:

- The communality[5] in positive mood measures and implicit familiarity measures should be associated with modes of processing.

- Any variables able to interfere with the (mis)interpretation of affect as implicit familiarity should qualify the MIPE.
  a) Attribution of current feelings to a source other than familiarity makes frontiers of both feelings clear, avoiding a (mis)interpretation of positive affect to implicit familiarity, and thus preventing it from impacting processing.

[5] Only the common variability of mood and implicit familiarity measures can be claimed to represent their latent variable, the implicit feeling of familiarity.

b) As (mis)interpretations are more likely when the situation is complex (with several sources of familiarity) rather than simple (clearly familiar or unfamiliar), situational complexity will qualify the MIPE.

c) Positive mood that is blocked from being attributed to familiarity will not impact processing.

Besides generating these multiple hypothesis that may help distinguish between the mood-as-regulation-mechanism hypothesis and other accounts of the MIPE, this regulation approach encourages the development of several new studies. These studies allow knowledge about the impact of familiarity and mood on information processing to be extended.

1. If positive affect is integral to the implicit feeling of familiarity, this relationship should be able to be assessed at an implicit level. That is, the implicit feeling of familiarity should produce implicit positive evaluation. Thus:

- Familiar stimuli used as primes, by automatically triggering positive evaluation, should produce faster evaluations of positive stimuli and slower evaluations of negative stimuli (Fazio, Sanbonmatsy, Powell, & Kardes, 1986).

2. Current data have suggested that familiarity and mood impact evaluative judgments. This infusion of feelings on judgment is more likely when processing is non-analytic (e.g. Schwarz & Clore, 1983, 1988; Wyer &

Carlston, 1979). Conscious awareness of repeated exposure undermines the impact of familiarity on evaluative judgments (Bornstein & D'Agostino, 1994). Since the mood-as-regulation-mechanism hypothesis assumes that non-analytic processing is associated with a positive mood state, and that positive affect is integral to implicit familiarity, this hypothesis predicts that:

- Positive feelings are more likely to impact judgments than non-positive feelings.

- Conscious awareness of repeated exposure should undermine both familiarity and mood influences on evaluative judgments.

3. If methodological problems associated with the concomitance of feeling activation and stimulus presentation could be overcome, the mood-as-a-regulation mechanism hypothesis would expect parallelism in the effects of familiarity and mood on recognition and perceptual identification. That is:

- Mood would impact the latency and accuracy of recognition judgments[6].
  a) Positive moods would favor more and quicker "Yes" responses (recognition decisions, both Hits and False alarms) and reduce "No" responses;

[6] Some data can already be claimed as suggesting such parallel. Negative mood seems to impair memory performance in both recall and recognition tasks (e.g., Brand & Jolles, 1987; Johnson & Magaro, 1987; Richards & Ruff, 1989). C. L. Elliot and Green (1992), comparing the performance of depressed and non-depressed individuals in implicit and explicit memory tasks, found a main effect of mood in both tasks. Non-depressed individuals identified previously presented words better than depressed individuals.

b) Negative moods would delay and reduce correct memory judgments of old items (fewer Hits - which would have to be based on explicit recall) at the same time as facilitating the rejection of new ones (fewer False Alarms).

- Mood would impact the latency and accuracy of perceptual identification judgments[7].

  a) Positive mood should induce more and more rapid identifications (both correct and incorrect).

  b) Negative mood should delay and reduce correct identifications at the same time as it facilitates rejections.

4. In persuasion settings familiarity is not a factor related only with repetition of a message. The regulation approach that assumes implicit feeling of familiarity to regulate processing has implications for other persuasion factors:

- Pro-attitudinal messages, because they are more consistent with information retrieval in memory, are more likely to be processed non-analytically than are counter-attitudinal messages.

---

[7] Some studies have addressed mood congruency effects in lexical decisions tasks. M. S. Clark, Teasdale, Broadbent, and Martin (1983) did not found mood congruency effects. However, the pattern of their results suggested that happy individuals were generally faster in their identifications and that positive words induced even faster reactions. In several studies developed by Niedenthal and collaborators (Niedenthal, Setterlund, & D. E. Jones, 1994; Niedenthal & Setterlund, 1994), a mood congruency effect was found with regard to the threshold for correct lexical decisions about emotional words. However, no congruency effect was found with valenced words. Importantly for our purposes, across all studies and in all mood conditions, happy and positive words were identified faster than sad and negative words.

- The direction of persuasive arguments may qualify the MIPE. The impact of mood on processing is more likely in the face of counter-attitudinal messages than pro-attitudinal messages.
- Level of expertise with the attitudinal issue may qualify the MIPE. High levels of knowledge will be associated with more extreme implicit levels of familiarity, and thus the processing of experts will be less sensitive to mood manipulation than that of non-experts.

5. By assuming that mood has a regulatory role, the mood-as-regulation-mechanism hypothesis sees mood as varying continuously in a low level range of intensity (see Chapter III). The implicit experience of even extreme familiarity is neither intense, nor stable. Thus, accounting for some apparently contradictory results in the literature, the mood-as-regulation-mechanism hypothesis predicts that:

    - Affective states, such as the ones usually referred to as euphoria or dysphoria are quantitatively and qualitatively different from mood. Thus the impact of these more or less pathologic states on cognitive processes should not be extrapolated from the impact of normal variations in mood intensity.
    - Euphoria and dysphoria may interfere with the regulation mechanism, by disturbing sensitivity to the implicit feeling of familiarity (making individuals' behavior less adaptive).

        a) An euphoric state can maintain reliance on top-down processing even if the current situation changes mood in a negative direction.

b) A depressive state can prevent individuals from processing information less systematically, even when all situational and internal cues inform them of a simple efficient way of dealing with the situation. Via this mechanism, depression can be expected to impair the quality of individuals' performances, which would be better if they engaged in more superficial processing.

Besides focusing on the test of these hypotheses, future developments need also to extend the reliability of the hypotheses assessed in Chapter V, by replicating the findings of parallel effects of familiarity and mood in several other settings and fields. Additionally, attention needs to be given to methodological issues relevant to testing all these hypotheses. Two aspects are of special interest. First, dissociative measures of processing, which allow clearer inferences about processing mode, need to be developed. In addition, a better understanding of how currently available dependent measures reflect processing mode is needed. Second, more reliable measures of the implicit feeling of familiarity need to be developed.

As the fundamental criterion of fruitfulness for a theoretical framework is its ability to pose new questions and to set clear paths for empirical development (Kuhn, 1970), the mood-as-regulation-mechanism hypothesis would appear to be a highly productive and generative approach.

Final Conclusion

The finding that positive mood triggers non-analytic processing in many domains of social thought has had particular heuristic value for the field of social cognition. It has generated a large number of theoretical approaches that have added to our understanding of social phenomena and of the information processing mechanisms that underlie them. I hope that in generating the mood-as-regulation-mechanism hypothesis, and providing its initial empirical support, the ideas in this dissertation will prove equally fruitful.

References

Abelson, R. P. (1994). A personal perspective in social cognition. In P. Devine. D. L. Hamilton. & T. M. Ostrom (Eds.), Social Cognition: Impact on social psychology (pp. 15-37). New York: Academic press.

Abelson, R. P. (1983). Whatever became of consistency theory? *Personality and Social Psychological Bulletin*, *9*, 37-54.

Adelmann, P. K., & Zajong, R. B. (1989). Facial efference and the experience of emotion. *Annual review of Psychology*, *40*, 249-280.

Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Addison-Wesley.

Anderson, N. H. (1981). *Foundations of information integration theory*. New York, NY: Academic Press.

Arkes, H. R., Boehm, L. E., & Gang Xu, (1991). Determinants of Judged Validity. *Journal of Experimental Social Psychology, 27*, 576-605.

Arkes, H. R., & Freedman, M. R. (1984). A demonstration of the costs and benefits of expertise in recognition memory. *Memory and Cognition, 12* (1),84-89.

Asuncion, A. G., & Lam, W. F. (1995). Affect and impression formation: Influence of mood on person memory. *Journal of Experimental Social Psychology, 31*, 437-464.

Averill, J. R. (1980). A constructive view of emotion. In R. Plutchik, & H. Kellerman (Eds.), *Theories of emotion* (pp.305-340). New York: Academic Press.

Bacon, F. T. (1979). Credibility of repeated statements: Memory for trivia. *Journal of Experimental Psychology: Human Learning and Memory, 5*, 241-252.

Bargh, J. A. (1996). Automaticity in Social Psychology. In E. T. Higgins, & A. W. Kruglanski (Eds.), *Social Psychology. Handbook of basic principles*, (pp.169-183). New York: The Guilford Press.

Bargh, J. A. (1994). The four horsemen of automacity: Awareness, intention, efficiency, and control in social cognition. In R. S. Wyer, Jr., & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed.,Vol.1, pp. 1-40). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Bargh, J. A. (1990). Auto-motives: Preconscious determinants of thought and behavior. In E. T. Higgins, & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition* (Vol.2, pp.93-130). New York: Guilford Press.

Bargh, J. A. (1989). Conditional automaticity: Varieties of automatic influence in social perception and cognition. In J. S. Uleman, & J. A. Bargh (Eds.), *Unintended thought: Limits of awareness, intention and control* (pp. 3-51). New York: Guilford Press.

Bargh, J. A., & Thein, R. D. (1985). Individual construct accessibility, person memory, and the recall-judgment link: The case of information overload. *Journal of Personality and Social Psychology*, *49*, 1129-1146.

Barton , S. B., & Sanford , A. J. (1993). A case study of anomaly detection: Shallow semantic processing and cohesion establishment. *Memory and Cognition*, *2(4)*, 477-487.

Batra, R., & Stayman, D. M. (1990). The role of mood in advertising effectiveness. *Journal of Consumer Research* , *17*, 203-214.

Batson, C. D., Shaw, L. L., & Olsean, K. C. (1992). Differentiating affect, mood, and emotion. In M. S. Clark (Ed.), *Review of Personality and Social psychology* (Vol.11, pp.294-326). Newbury Park, CA: Sage Publications.

Baugmann, D. J., Cialdini, R. B., & Kenrick, D. T. (1981). Altruism as hedonism: helping and self-gratification sad equivalent responses. *Journal of Personality and Social Psychology, 40*, 1039-1046.

Begg, I., Anas, A., & Farinacci, S. (1992) Dissociation of processes in belief: Source recollection, statement familiarity, and the illusion of truth. *Journal of Experimental Psychology: General, 121*(4), 446-458.

Begg, I., & Armour, V. (1991). Repetition and the ring of truth: Biasing comments. *Canadian Journal of Behavioural Science, 23,*195-213.

Begg, I., Armour, V., & Kerr, T. (1985). On believing what we remember._*Canadian Journal of Behavioural Science, 17,*199-214.

Birnbaum, M. H., & Stegner, S. E. (1979). Source credibility in social judgment: Bias, expertise and judge's point of view. *Journal of Personality and Social Psychology, 37,* 48-74.

Birnbaum, M. H., Wong, R. , & Wong, L. K. (1976). Combining information from sources that vary in credibility. *Memory and Cognition, 4,* 330-336.

Blaney, P. H. (1986). Affect and memory: A review. *Psychological Bulletin, 99,* 229-246.

Blaxton, T. A. (1989). Investigating dissociations among memory measures: Support for a appropriate processing framework. *Journal of Experimental Psychology: Learning, Memory and Cognition, 15*, 657-668.

Bless, H., Bohner, G., Schwarz, N., & Strack, F. (1990). Mood and Persuasion : a cognitive response analysis. *Personality and Social Psychology Bulletin, 16,* 331-345.

Bless, H., Clore, G. L., Schwarz, N., Golisano, V., Rabe, C., & Wolk, M. (1996). Mood and the use of scripts: Does a happy mood really lead to mindlessness? *Journal of Personality and Social Psychology, 71*(4), 665-679.

Bless, H., & Fiedler, K. (1995). Affective states and the influence of activated general knowledge. *Personality and Social Psychology Bulletin, 21*(7), 766-778

Bless, H., Hamilton, D. L., & Mackie, D. M. (1992). Mood effects on the organization of person information. Special Issue: Positive-negative asymmetry in affect and evaluations: Part I. *European-Journal-of-Social-Psychology, 22* (5), 497-509.

Bless, H., Mackie , D. M., & Schwarz , N. (1992). Mood effects on attitude judgments: Independent effects of mood before and after message elaboration. *Journal of Personality and Social Psychology, 63*(4), 585-595.

Bless, H., & Schwarz, N. (in press). Sufficient and necessary conditions in dual process models: the case of mood and information processing. To appear in S. Chaiken, & Y. Trope (Eds.), *Dual-process models in social psychology*. New York: Guilford Press.

Bless, H, Schwarz, N., & Wilenad, R. (1996). Mood and the impact of categorical membership and individuating information. *European Journal of Social Psychology, 26* (6), 935-960.

Bobrow, D. G., & Norman, D. A. (1975). Some principles of memory schemata. In D. G. Bobrow, & A. Collins (Eds.), R*epresentation and understanding: Studies in cognitive science* (pp. 131-149). New York: Academic Press.

Bodenhausen, G. V. (1993). Emotions, arousal, and stereotypic judgments. A heuristic model of affect and stereotyping. In D. M. Mackie, & D. L. Hamilton (Eds.), *Affect cognition, and stereotyping. Interactive processes in group perception* (pp.13-33). New York: Academic Press.

Bodenhausen, G. V. (1990). Stereotypes as a judgmental heuristics: Evidence of circadian variations in discrimination. *Psychological Sciences, 1*, 319-322.

Bodenhausen, G. V. (1988). Stereotypic biases in social decision making and memory: Testing process models of stereotype use. *Journal of Personality and Social Psychology, 55*, 726-737.

Bodenhausen, G., Kramer, G. P., & Susser, K. (1994). Happiness and stereotypic thinking in social judgments. *Journal of Personality and Social Psychology, 66*(4), 621-632.

Bodenhausen, G. V., & Lichenstein, M. (1987). Social stereotypes and information-processing strategies: The impact of task complexity. *Journal of Personality and Social Psychology, 52,* 871-880.

Bodenhausen, G., Sheppard, L. A., & Kramer, G. P. (1994). Negative affect and social judgment: The differential impact of anger and sadness. *European Journal of Social Psychology, 24*(1), 45-62.

Bodenhausen, G. V., & Wyer, Jr., R. S. (1985). Effects of stereotypes on decision making and information-processing strategies. *Journal of Personality and Social Psychology, 48*, 267-282.

Bohner, G., & Apostolidou, W. (1994). Mood and persuasion: Independent effects of affect before and after message processing. *Journal of Social Psychology, 134(5)*, 707-709.

Bohner, G., Chaiken, S., & Hunyadi, P. (1994). The role of mood and message ambiguity in the interplay of heuristic and systematic *processing*. Special Issue: Affect in social judgments and cognition. *European Journal of Social Psychology, 24*(1), 207-221 .

Bohner, G., Crow K., Erb, H., P., & Schwarz, N. (1992). Affect and persuasion: mood effect on the processing of message content and context cues and on subsequent behavior. *European journal of social psychology, 22*, 511-530.

Bornstein, R. F. (1992). Subliminal mere exposure effects. In R. F. Bornstein, & T. S. Pittman (Eds.), Perception without awareness (pp. 191-211). New York, NY: Guilford Press.

Bornstein, R. F. (1989). Exposure and affect: Overview and Meta-analysis of research, 1968-1978. *Psychological Bulletin, 106*, 265-289.

Bornstein, R. F., & D'Agostino, P. R. (1994). The attribution and discounting of perceptual fluency: Preliminary tests of a perceptual fluency / attributional model of the mere exposure effect. *Social Cognition, 12*, 123-128.

Bornstein, R. F., & D'Agostino, P. R. (1992). Stimulus recognition and the mere exposure effect. *Journal of Personality and Social Psychology, 63*(4), 545-552.

Bower, G. H. (1991). Mood congruity of social judgments. In J. P. Forgas (Ed.), *Emotion and social judgments* (pp. 31-53). Oxford, England: Pergamon.

Bower, G. H. (1981). Mood and memory. *American Psychologist,36,* 129-148.

Bowers, J. S., & Schachter, D. L. (1990). Implicit memory and test awareness. *Journal of Experimental Psychology: Learning, Memory and Cognition, 16,* 404-416.

Brand, N., & Jolles, J. (1987). Information processing in depression and anxiety. *Psychological Medicine, 17*(1),145-153.

Brehm, J. W., & Self, E. A. (1989). The intensity of motivation. *Annual Review of Psychology, 40*, 109-131.

Brewer, M. B. (1988). A dual process model of impression formation. In R. S. Wyer, & T. K. Srull (Eds.), *Advances in Social Cognition* (pp. 1-44, Vol. 1). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Brewer, D., Doughtie, E., B., & Lubin, B. (1980). Induction of mood and mood shift *Journal of Clinical Psychology, 36* (1), 215-226.

Brock, T. C. (1967). Communication discrepancy and intent to persuade as determinants of information receptivity. *Journal of Personality and Social Psychology , 14*, 292-301.

Broadbent, D. E. (1958). *Perception and communication.* London: Pergamon Press.

Brunner, J. S. (1957). On perceptual readiness. *Psychological Review*, 64, 123-152.

Cacioppo, J. T. & Petty, R. E. (1989). Effects of message repetition on argument processing, recall, and persuasion. *Basic and Applied Social Psychology, 10*(1), 3-12.

Cacioppo, J. T., & Petty, R.E. (1982). The need for cognition. *Journal of Personality & Social Psychology, 42*(1), 116-131.

Carlson, J. G., & Hatfield, E. (1992). *Psychology of emotion.* Fort Worth: Harcourt Brace Jonavich College Publishers.

Carver, C. S., Lawrence, J. W., & Scheier, M. F. (1996). A control-process perspective on the origins of affect. In L. L. Martin, & A. Tesser (Eds.), *Striving and feeling. Interaction among goals, affect, and self-regulation* (pp.11-52). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Carver, C. S., & Scheier, M. F. (1990a). Origins and functions of positive and negative affect: A control-process view. *Psychological Review, 97*, 19-35.

Carver, C. S., & Scheier, M. F. (1990b). Principles of self-regulation: Action and emotion. In R. Sorrentino, & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (Vol. 2, pp. 3-52). New York: Guilford Press.

Chaiken, S. (1987). The heuristic model of persuasion. In M. P. Zanna, J. M. Olson, & C. P. Herman, *Social influence: The Ontario Symposium* (Vol.5, pp. 3-39). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus messages cues in persuasion. *Journal of Personality and Social Psychology, 39*, 752-766.

Chaiken, S., & Eagly, A. H. (1983). Communication modality as a determinant of persuasion: The role of communicator salience. *Journal of Personality and Social Psychology*, 34, 605-614.

Chaiken, S., Giner-Sorolla, R., & Chen, S. (1996). Beyond accuracy. Defence and impression motives in heuristic and systematic information processing. In P. M. Gollwitzer, & J. A. Bargh (Eds.*), The psychology of action. Liking cognition and motivation to behavior* (pp. 553-578). New York: Guilford Press.

Chaiken, S., Liberman, A., & Eagly, A. H. (1989). Heuristic and systematic processing within and beyond the persuasion context. In J. S. Uleman, & J. A. Bargh (Eds.), *Unintended thought: Limits of awareness, intention and control* (pp. 212-252). New York: Guilford Press.

Chaiken, S., & Maheswaran, D. (1992). *Heuristic processing can bias systematic processing: The effect of source credibility, arguments ambiguity, and task importnace on attitude judgment*. Unpublished manuscript, New York University, New York, NY.

Chaiken, S., Wood, W., & Eagly, A. H. (1996). Principles of persuasion. In E. T. Higgins, & A. W. Kruglanski (Eds.), *Social Psychology. Handbook of basic principles* (pp. 702-743). New York : Guilford Press.

Chase W. G. & Simon H. A. (1973). Perception in chess. *Cognitive Psychology*, *4*, 55-81.

Cheesman, J., & Merikle, P.M. (1986). Distinguish conscious from unconscious mental processes. *Canadian Journal of Psychology, 40*, 343-367.

Chomsky, M. (1968). *Language and mind*. New York: Harcourt, Brace, & Wolrd.

Clark, M. S. (1982). A role for arousal in the link between feelings states, judgments, and behavior. In M. S. Clark, & S.T. Fiske (Eds.), *Affect and Cognition. The seventeenth annual Carnegie symposium on cognition* (pp. 263-290). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Clark, M. S., & Isen, A. M.(1982). Feeling states and social behavior. In A. Hastorf, & A. M. Isen (Eds.), *Cognitive social psychology* (pp.73-108). NY: Elsevier/North-Holland.

Clark, M. S., Teasdale, J. D., Broadbent, D. E., & Martin, M. (1983). Effect of mood in lexical decisions. *Bulletin of Psychonomic Society*, *21*, 175-178.

Clark, M. S., & Waddell, B. A. (1983). Effects of mood in thoughts about helping, attraction, information acquisition. *Social Psychology Quarterly*, *46*, 31-35.

Clore, G. L. (1992). Cognitive phenomenology: Feelings and the construction of judgment. In L. L. Martin, and A. Tesser (Eds.), *The construction of social judgments* (pp.133-163). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Clore, G. L., & Parrott, W.G. (1994). Cognitive feelings and metacognitive judgments. Special Issue: Affect in social judgments and cognition. *European Journal of Social Psychology, 24*(1), 101-115.

Clore, G. L., Schwarz, N., & Conway, M. (1994). Affective causes and consequences of social information processing. In R. S. Wyer, & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed. Vol.1, pp. 323-418). Hillsdale , NJ: Lawrence Erlbaum Associates Inc.

Craik, F. I. M., & Lockhart, R. S. (1972). Levels of processing: a framework for memory research. *Journal of Verbal Learning and Verbal Behavior, 11*, 671-684.

Craik, F. I. M., & Tulving, E. (1975). Depth of processing and the retention of words in episodic memory. *Journal of Experimental Psychology: General, 104*, 268-294.

Cunningham, M. R. (1979). Weather, mood, and helping behavior: Quasi-experiments with the sunshine Samaritan. *Journal of Personality and Social Psychology*, *37*, 1947- 1956.

Curren, M. T., & Harich, K. R.(1993). Performance attributions: Effects of mood and involvement. *Journal of Education Psychology*, *85*(4), 605-609.

Damasio, A. R. (1994). *Decartes' error. Emotion, reason and the human brain.* London: Picador.

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, *56*, 680-690.

Dovido, J. F., & Fazio, R. H. (1992). New technologies for the direct and indirect assessment of attitudes. In J. Tanur (Ed.), *Question about survey questions: meaning, memory, attitudes, and social interaction* (pp. 204-237). New York: Russel Sage.

Diener, E. (1984). Subjective well being. *Psychological Bulletin, 95*, 542-575.

Drake, R. A. (1988). Cognitive style induced by hemisphere priming: Consistent versus inconsistent self-report. *Bulletin of the Psychonomic Society*, *26*, 313-315.

Drake, R. A. (1981). Processing persuasive arguments: Recall and recognition as a function of agreement and manipulated. activation asymmetry. *Brain and Cognition*, *5*, 83-94.

Drake, R. A., & Bingham, B. R. (1985). Induced lateral orientation and persuasibility. *Brain and Cognition*, *4*, 156-164.

Eagly, A. H., & Chaiken, S., (1993). *The psychology of attitudes.* Forth Worth: Harcourt Brace Jovanovich, Inc.

Eagly, A. H., & Chaiken, S., (1984). Cognitive theories of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology,* (Vol.17, pp.267-359). San Diego, CA: Academic Press.

Egan, D. E., & Schwartz, B. J. (1979). Chunking in recall of symbolic drawings. *Memory and Cognition*, 7(2),149-158.

Eich, J. M. (1982). A composite holographic associative recall model. *Psychological Review*, *89*, 627-661.

Elliot, C. L., & Green, R. L. (1992). Clinical depression and implicit memory. *Journal of Abnormal Psychology, 101*(3), 572-574.

Ellis, H. C. (1985). On the importance of mood intensity and encoding demands in memory: Commentary on Hasher, Rose, Zacks, Sanft, and Doren. *Journal of Experimental Psychology: General, 114,* 392-395.

Ellis, H. C., & Ashbrook, P. W. (1989). The state of mood in memory research: A selective review. *Journal of Social Behavior and Personality, 4,* 1-21.

Ellis, H. C., & Ashbrook, P. W. (1988). Resource allocation model of the effects of depressed mood states on memory. In K. Fiedler, & J. Forgas (Eds.), *Affect, cognition and social behavior* (pp. 25-43). Zurich: C. J. Hogrefe.

Ellis, H. C., Thomas, R. L., & Rodriguez, I. A. (1984). Emotional mood states and memory: Elaborative encoding, semantic processing, and cognitive effort. *Journal of Experimental Psychology: Learning, Memory and Cognition, 10,* 470-482.

Epstein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *American Psychologist*, 49(8), 709-724

Epstein, S. (1990). Cognitive-experiential self-theory. In L. Pervin (Ed.), *Handbook of Personality Theory and Research* (pp.165-192). New York, NY: Guilford Press.

Epstein, S. (1973). The self concept revisited: Or a theory of a theory. *American Psychologist*, 28, 404-416.

Erber, R. (1991). Affective and semantic priming: Effects of mood on category accessibility and inference. *Journal of Experimental Social Psychology*, 27, 480-498.

Erber, R. (1996). The self-regulation of moods. In L. L. Martin, & A. Tesser (Eds.), Striving and feeling. Interactions among goals, affect, and self- regulation, (pp. 251- 278). Mahway, NJ: Lawrence Erlbaum Associates Inc.

Erber , R., Wegner , D. M., & Therriault , N. (1996). On being cool and collected: Mood regulation in anticipation of social interaction. *Journal of Personality and Social Psychology*, 70(4), 757-766.

Erickson, T. D., & Mattson, M. E. (1981). From words to meaning: A semantic illusion. *Journal of Verbal Learning and Verbal Behavior*, 20(5), 540-551.

Eysenck,, M. W. (1979). The feeling of knowing a word's meaning. *British Journal of Psychology, 70* (2), 243-251.

Fazio, R. H. (1986). How do attitudes guide behavior? In R. M. Sorrentino, & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (pp. 204-243). New York, NY.: Guilford Press.

Fazio, R. H.,. Powell, M. C., & Herr, P.M. (1983). Towards a process model of the attitude-behavior relation: Accessing one's attitude upon mere observation of the attitude object. *Journal of Personality and Social Psychology*, 44, 723-735.

Fazio, R. H., Sanbonmatsy, D. M., Powell, M. C., & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology, 50,* 229-238.

Fiedler, K., (1991). On the task, the measures and the mood in research on affect and social cognition. In J. P. Forgas (Ed.), *Emotion and social judgments. International series in experimental social psychology* (pp.83-104). Oxford: Pergamon Press.

Fiedler, K. (1988). The dependence of the conjunction fallacy on subtle linguistic factors. *Psychological Research, 50*(2), 123-129.

Fiedler, K., Asbeck, J., & Nickel, S., (1991). Mood and constructive memory effects on social judgement. Special Issue: Emotion in social life. *Cognition and Emotion, 5*(5-6), 363-378.

Fiske, S. T. (1988). Compare and contrast: Brewer's dual process model and Fiske et al.'s continuum model. In Thomas K. Srull, & Robert S. Wyer Jr., (Eds.). *A dual process model of impression formation. Advances in social cognition,*(Vol.1, p. 65-76). Hillsdale, NJ : Lawrence Erlbaum Associates Inc

Fiske, S. (1982). Schema triggered affect: applications to social perception. In M. S. Clark, & S. T. Fiske (Eds.), *Affect and Cognition. The seventeenth annual Carnegie Symposium on Cognition* (pp. 55-78). Hillsday, NJ: Lawrence Erlbaum Associates Inc.

Fiske, S. T., & Neuberg, S. L. (1990). A continuum of impression formation from category-based to individuating processes: Influences of information and motivation on attention and interpretation. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 23, pp. 1-74). San Diego, CA: Academic Press.

Fiske, S. R., & Pavelchak, M. A. (1986). Category-based versus piecemeal-based affective responses: Developments in schema-triggered affect. In R.M. Sorrentino, & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior (*pp. 167- 203). New York, NY: Guilford Press.

Fiske, S. R., & Taylor, S., E. (1991). *Social cognition.* (2nd Ed.). New York: McGraw-Hill.

Fodor, J. A., & Pylyshyn, Z. W. (1988). Connectionism and cognitive architecture: A critical analysis. *Cognition, 28*, 3-71.

Forgas, J. P. (1995a). Strange couples: Mood effects on judgments and memory about prototypical and atypical relationships. *Personality and Social Psychology Bulletin, 21*(7) 747-765.

Forgas, J. P. (1995b). Mood and judgment: The affect infusion model (AIM). *Psychological-Bulletin,* 117(1) 39-66.

Forgas, J. P. (1994a). Sad and guilty? Affective influences on the explanation of conflict in close relationships. *Journal of Personality and Social Psychology, 66*(1), 56-68.

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

Forgas, J. P. (1993). On making sense of odd couples: Mood effects on the perception of mismatched relationships. *Personality and Social Psychology Bulletin,* 19(1), 59-70.

Forgas, J. P. (1992a). Mood and the perception of unusual people: Affective asymmetry in memory and social judgments. Special Issue: Positive-negative asymmetry in affect and evaluations: II. *European Journal of Social Psychology*; 22(6), 531-547.

Forgas, J. P. (1992b). On mood and peculiar people: Affect and person typicality in impression formation. *Journal of Personality and Social Psychology, 62*(5), 863-875

Forgas, J. P. (1991). Affective influences on partner choice: Role of mood in social decisions. *Journal of Personality and Social Psychology, 61*(5) 708-720.

Forgas, J. P. (1990). Affective influences on individual and group judgments. *European Journal of Social Psychology, 20*(5) 441-453

Forgas, J. P. (1989). Mood effects on decision making strategies. *Australian Journal of Psychology, 41*,197-214.

Forgas, J. P., & Bower, G. H. (1987). Mood effects on person-perception judgment. *Journal of Personality and Social Psychology, 53*(1) 53-60.

Forgas, J. P., Bower, G. H., & Moylan, S. J. (1990). Praise or blame? Affective influences on attributions for achievement. *Journal of Personality and Social Psychology, 59*(4) 809-819.

Forgas, J. P., & Moylan, S. J. (1991) Affective influences on stereotype judgements. Special Issue: Emotion in social life. *Cognition and Emotion, 5*(5-6), 379-395.

Forgas, J., & Moylan, S. (1987). After the movies: transient mood and social judgments. *Personality and Social Psychological Bulletin, 13*, 467-477.

Fridja, N. H. (1994). Varieties of affect: emotion and episodes, moods and sentiments. In P. Ekman, & R.J. Davidson (Eds.), *The Nature of emotion. Fundamental questions. Series in affective science*. New York: Oxford University Press.

Fridja, N. H. (1993). Moods, emotion episodes and emotions. In M. Lewis, & J. M. Haviland (Eds.), *Handbook of emotions*. NY: Guilford Press.

Fridja, N. H. (1988). The laws of emotion. *American Psychologist, 43*, 349-358.

Fridja, N. H. (1986). *The emotions*. New York: Cambridge University Press.

Fridja, N. H., Ortony, A., Sonnemans, J., & Clore, G. L. (1992). The complexity of intensity: Issues concerning the structure of emotion intensity. In M. S. Clark (Ed.), *Emotion. Review of Personality and Social Psychology*, (Vol. 13, pp.60-89). Newbury Park: Sage.

Garcia-Marques, L., & Hamilton, D. L. (1996). Resolving the apparent discrepancy between the incongruency and the expectancy-based illusory correlation effects: The “TRAP” mode. *Journal of Personality and Social Psychology, 71*, 845-860.

Gerrig, R. J., & Bower, G. H. (1982). Emotional influences on word recognition. *Bulletin of Psychonomic Society,* 19, 197-200.

Gilbert, D. T., Krull, D. S., & Pelham, B. W., (1988).Of unspoken: social inference and self-regulation of behavior. *Journal of Personality and Social Psychology , 55*, 685-694.

Gilbert, D. T., Pelham, B. W., & Krull, D. S. (1988). On cognitive busyness: When person perceivers meet persons perceived. *Journal of Personality and Social Psychology, 54,* 733-739.

Gilbert, D. T., & Krull, D. S. (1988). Seeing less and knowing more: The benefits of personal ignorance. *Journal of Personality and Social Psychology, 54*, 193-202.

Gilbert, D. T. (1991). How systems Believe. *American Psychologist, 46*(2) 107-119.

Gilbert, D. T. (1989). Thinking lightly about others: Automatic components of the social inference process. In J. S. Ulman, & J. A. Bargh (Eds.), *Unintended thought* (pp. 189-211). New York: Guilford Press.

Gillund, G., & Shiffrin, R. M. (1984). A retrieval model for both recognition and recall. *Psychological Review, 91* (1), 1-67.

Goodwin, A. M., & Williams, J. M. (1982). Mood-induction research--its implications for clinical depression. *Behaviour Research and Therapy, 20*(4):373-382.

Grasser, A. C. (1981). *Prose comprehension beyond the word.* New York: Spring-Verlag.

Graesser, A. C., Gordon, S. E., & Sawyer, J. D.(1979). Recognition memory for typical and atypical actions in scripted activities: Tests of a script pointer + tag hypothesis. *Journal of Verbal Learning and Verbal Behavior, 18*(3), 319-332.

Graesser, A. C., & Nakamura, G. V. (1982). The impact of a schema of a schema on comprehension and memory. In G. H. Bower (Ed.), The Psychology of Learning and Motivation (Vol. 16, pp. 315-378). New York, NY: Academic Press.

Graesser, A. C., Woll, S. B, Kowalski, D. J., & Smith, D. A. (1980). Memory for typical and atypical actions in scripted activities. *Journal of Experimental Psychology: Human Learning and Memory, 6*(5), 503-515

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

Hamann, S. B. (1990). Level-of-processing effects in conceptually driven implicit tasks. *Journal of Experimental Psychology: Learning, Memory and Cognition, 16*, 970-977.

Hamilton, D. L. (1981). Cognitive representations of persons. In E. T. Higgins, C. P. Herman, & M. P. Zanna (Eds.), *Social cogntion: The Ontario Symposium* (Vol.1, pp. 135-160). Hillsdale, NJ: Lawrence Erlbaum Associates Inc

Hamilton, D. L., Stroessner, S. J., & Mackie, D. (1993). The influence of affect on stereotyping: he case of illusory correlations. In D. M. Mackie, & D. L. Hamilton (Eds.), *Affect cognition , and stereotyping. Interactive processes in group perception* (pp.39-58). New York: Academic Press.

Hartlage, S., Alloy, L. B., Vazquez, C., Dykman, B. Automatic and effortful processing in depression (1993). *Psychological Bulletin, 113*(2), 247-278.

Hasher, L. Goldstein, D., & Toppino, T. (1977). Frequency and the conference of referential validity. *Journal of Verbal learning and verbal behavior, 16*, 107-112.

Hasher, L., & Zacks, R.T. (1979). Automatic and effort processes in memory. *Journal of Experimental Psychology: General, 108*, 356-388.

Hastie, R., & Kumar, A. P. (1979). Person memory: Personality traits as organizing principles in memory for behaviors. *Journal of Personality and Social Psychology, 37*, 25-38.

Hertel, P. T., & Hardin, T. S. (1990). Remembering with and without awareness in a depressive mood: Evidence of deficits in initiative. *Journal of Experimental Psychology: General, 119*, 45-59.

Higgins, E. T. (1996). Knowledge activation: Accessibility, Applicability and salience. In E. T. Higgins, & A. W. Kruglanski (Eds.), *Social Psychology. Handbook of basic principles* (pp.133-167). New York, NY: Guilford Press.

Higgins, E. T. (1989). Knowledge accessibility and activation: subjectivity and suffering from unconscious sources. In J. S. Uleman, & J. A. Bargh (Eds.), *Unintended thought,* (pp. 75-123). NY: Guilford Press.

Higgins, E. T., & Bargh, J. A. (1987). Social cognition and social perception. *Annual Review of Psychology, 38*, 369-425.

Higgins, E. T., Bargh, J. A., & Lombardi, W. (1985). The nature of priming effects in categorization. *Journal of Experimental Psychology: Learning, Memory and Cognition, 11*, 59-69.

Higgins, E. T., & Brendel, M. (1995). Accessibility and applicability: Some " activation rules" influencing judgment. *Journal of Experimental Social Psychology, 31*, 218-243.

Higgins, E. T., & King, G. (1981). Accessibility of social constructs: Information processing consequences of individual and contextual variability. In N. Cantor & J. Kihlstrom (Eds.), *Personality, cognition and social interaction* (pp.69-122). Hillsdale, NJ: Erlbaum Associates Inc.

Higgins, E. T., Rholes, W. S., & Jones, C. R. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology, 13*(2), 141-154.

Hintzman, D. L. (1990). Human learning and memory: Connections and dissociations. *Annual Review of Psychology, 41*, 109-140.

Hintzman, D. L.(1988). Judgments of frequency and recognition memory in a multiple-trace memory model. *Psychological Review, 95*, 528-551.

Hintzman, D. L. (1974). Theoretical implications of the spacing effect. In R. L. Solso (Ed.), *Theories in cognitive psychology: The Loyola Symposium. Potomac.* Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Hogue, T. E., & Atkinson, M. L (1989). Approach and avoidance of social information. *Canadian Journal of Behavioural Science, 21*(3), 310-322.

Hovland, C. I. Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion: Psychological studies of opinion change*. Newhaven, CT: Yale University Press.

Humphreys, M. S., Bain, J. D., & Pike, R. (1989). Different ways to cue a coherent memory system: A theory for episodic, semantic, and procedural tasks. *Psychological Review, 96*, 208-233.

Hunt, R. R.(1995). The subtlety of distinctiveness: What von Restorff really did. *Psychonomic Bulletin and Review, 2*(1), 105-112.

Hunt, R. R., & Elliot, J. M. (1980). The role of nonsemantic information in memory: Orthographic distinctiveness effects on retention. *Journal of Experimental Psychology: General,109*(1), 49-74.

Hunt, R. R., & McDaniel, M. A.(1993). The enigma of organization and distinctiveness. *Journal of Memory, & Language, 32*(4), 421-445.

Hunt, R. R., & Smith, R. E.(1996). Accessing the particular from the general: The power of distinctiveness in the context of organization. *Memory and Cognition, 24*(2), 217-225.

Innes, J. M., & Ahrens, C. R. (1991). Positive mood, processing goals and effects of information on evaluative judgments. In J. P. Forgas (Ed), *Emotional and social judgments* (pp. 221-240). Oxford: Pergamon Press.

Isen, A. M. (1993). Positive affect and decision making. In M. Lewis, & J. M. Haviland (Eds.), .*Handbook of emotions.*, (pp. 261-277). New York, NY: Guilford.

Isen, A. M. (1987). Positive affect, cognitive processes and social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 20, pp.203-253). New York: Academic Press.

Isen, A. M. (1984). Towards understanding the role of affect in cognition. In R. S. Wyer, & T.K. Srull (Eds.), *Handbook of social cognition* (Vol.3, pp. 179-236). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Isen, A .M., & Daubman, K. A. (1984). The influence of affect on categorization. *Journal of Personality and Social Psychology, 47*, 1206-1217.

Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Social Psychology, 52*, 1112-1131.

Isen, A. M., & Gorgoglione, J. M. (1983). Some specific effects of four affect induction procedures. *Personality and Social Psychological Bulletin, 9*, 136-143.

Isen, A. M., Johnson, M. M. S., Hertz, E., & Robinson, G. F. (1985). The effects of positive affect on the unusualness of word associations. *Journal of Personality and Social Psychology, 48*, 1413- 414.

Isen, A. M., & Levin, P. F. (1972). The effects of feeling good on helping: Cookies and kindness. *Journal of Personality and Social Psychology , 21*, 384-388.

Isen, A. M., & Means, B. (1983). The influence of positive affect on decision making strategy. *Social Cognition, 2*, 18-31.

Isen, A. M. Means, B., Patrick, R., & Nowicki, G. (1982). Some factors influencing decision making strategy and risk-taking. In M. S. Clark, & S.T. Fiske (Eds.), *Affect and cognition: The seventeenth annual Carnegie symposium on cognition* (pp. 243-261). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Isen, A. M., Means, B., Patrick, R., & Nowicki, G. (1982). Some factors influencing decision making and risk taking. In M. S. Clark, & S. T. Fiske (Eds.), *Affect and cognition. The seventeenth annual Carnegie symposium* (pp. 243-262). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Isen, A. M., Shalker, T. E., Clark, M. S., & Karp, L. (1978). Positive affect, accessibility of material in memory, and behavior: A cognitive loop ? *Journal of Personality and Social Psychology, 36*, 1-12.

Isen, A. M., & Simmonds, S. F. (1978). The effect of feeling good on a helping task that is incompatible with good mood. *Social Psychology*, 41, 345-349.

Jacobsen, E. (1957). Normal and Pathological mood: Their nature and function. In R. S. Eisler, A. F. Freud, H. Hartman, & E. Kris (Eds.). *The psychoanalytic study of child* (pp.73-113). New York: International University Press.

Jacoby, L. L. (1996). Dissociation Automatic and consciously controlled effects of study/test Compatibility. *Journal of Memory and Language* , *35*(1), 32-52.

Jacoby, L. L. (1991). A process dissociation framework: separating automatic and intentional uses of memory. *Journal of Memory and Language, 30*, 513-541.

Jacoby, L. L. (1988). Memory observed and memory unobserved. In U. Neisser, & E. Winograd (Eds.), *Remembering reconsidered: Ecological and traditional approaches to the study of memory*. Cambridge, NY: Cambridge University Press.

Jacoby, L. L. (1983). Remembering the data: Analyzing interactive processes in reading. *Journal of Verbal Learning and Verbal Behavior, 22*, 485-508.

Jacoby, L. L., Allan, L. G., Collins, J. C., & Larwill, L. K. (1988). Memory influences subjective experience: Noise judgments. *Journal of Experimental Psychology: Learning, Memory and Cognition, 14*, 240-247.

Jacoby, L. L., & Brooks, L. R. (1984). Nonanalytic cognition: Memory, perception, and concept learning. In G. H. Bower (Ed.), *The Psychology of Learning and Motivation: Advances in Research and Theory,* (Vol. 18, pp. 1-47).

Jacoby, L. L., Craik, F. I. M. (1979). Effects of elaboration of processing at encoding and retrieval: Trace distinctiveness and recovery of initial context. In L. S. Cermak, & F. I. M. Craik (Eds.), *Levels of processing in human memory* (pp.1-22). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Jacoby, L. L., & Dallas, M. (1981). On the relation between autobiographical memory and perceptual learning. *Journal of Experimental Psychology: General, 3*, 306-340.

Jacoby, L. L., & Kelley, C. M. (1990). An episodic view of motivation: Unconscious influences of memory. In E. T. Higgins, & R. M. Sorrentino (Eds.), *Handbook of Motivation and Cognition* (Vol. 2, pp. 201-233). New York, NY: Guilford Press.

Jacoby, L. L., & Kelley, C. M. (1987). Unconscious influences of memory for a prior event. *Personality and Social Psychology Bulletin, 13*, 314-336.

Jacoby, L. L., Kelley, C. M., & Dywan, J. (1989). Memory attributions. In H. L. Roediger, & F. I. M. Craik (Eds.), *Varieties of memory and consciousness:*

Essays in honour of Endel Tulving (pp. 391-422). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Jacoby, L. L., Kelley, C., Brown, J. & Jasechko, J. (1989). Becoming famous overnight: Limits on the ability to avoid unconscious influences of the past. *Journal of Personality and Social Psychology, 56*(3), 326-338.

Jacoby, L. L., Levy, B. A., & Steinbach, K. (1992). Episodic transfer and automaticity: Integration of data-driven and conceptually-driven processing in rereading. *Journal of Experimental Psychology: Learning, Memory and Cognition* ,18,15-24.

Jacoby, L. L., Toth, J. P., Lindsay, D. S., & Debner, J. A. (1992). Lectures for a layperson: Methods for revealing unconscious processes. In R. F. Bornstein, & T. S. Pittman, (Eds.), *Perception without awareness: Cognitive, clinical, and social perspectives* (pp. 81-120). New York, NY: Guilford Press.

Jacoby, L. L., Toth, J. P., & Yonelinas, A., P. (1993). Separating conscious and unconscious influences of memory: Measuring recollection. *Journal of Experimental Psychology General, 122*(2), 139-154.

Jacoby, L. L., Toth, J. P., Yonelinas, A. P., & Debner, J. A. (1994). The relationship between conscious and unconscious influences: Independence or redundancy? *Journal of Experimental Psychology: General, 123*(2), 216-219.

Jacoby, L. L. Yonelinas, P., & Jennings, J. M. (1997). The relation between conscious and unconscious (automatic) influences: a declaration of independence. In J. D. Cohen, & J. W. Schooler (Eds.*), Scientific approaches to consciousness* (pp. 13- 48). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Jacoby, L. L., & Whitehouse, K. (1989). An illusion of memory: False recognition influenced by unconscious perception. *Journal of Experimental Psychology: General, 118*(2),126-135.

Jacoby, L. L., Woloshyn, V., & Kelley, C. M.(1989). Becoming famous without being recognized: Unconscious influences of memory produced by dividing attention. *Journal of Experimental Psychology: General, 118*(2), 115-125.

James, W. (1890). The principles of psychology. New York: Dover.

Johnson, B. T., & Eagly, A. H. (1989). The effects of involvement on persuasion: A meta-analysis. *Psychological Bulletin, 106*, 290-314.

Johnson, M. H., & Magaro, P. A. (1987). Effects of mood and severity on memory processes in depression and mania. *Psychological Bulletin, 101*, 28-40.

Johnson, M. K., & Hasher, L. (1987). Human learning and memory. *Annual Review of Psychology*, 38, 631-668.

Johnson, M. K., & Reeder, J. A. (1997). Consciousness as meta-processing. In J. D. Cohen, & J. W. Schooler (Eds.), *Scientific approaches to consciousness* (pp. 261-293). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Johnson-Laird, P. N., Legrenzi, P., & Legrenzi, M. S. (1972). Reasoning and a sense of reality. *British Journal of Psychology, 63*(3), 395-400.

Johnston W. A., & Hawley K. J. (1994). Perceptual inhibition of expected inputs: The key that opens closed minds. *Psychonomic Bulletin and Review*, 1, 56-72.

Jones, E. E., & Davis, K. E. (1965). From acts to dispositions: The attribution process in person perception. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*, (Vol.2, pp.219-266). New York: Academic Press.

Jones, G. V. (1987). Independence and exclusivity among psychological processes: Implication for the structure of recall. *Psychological Review, 94*, 229-235.

Kahneman, D. (1973). *Attention and effort*. Englewood Cliffs, NJ: Prentice-Hall

Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review, 93*, 136-153.

Kahneman, D., & Treisman, A. (1984). Changing views of attention and automaticity. In R. Parasuraman (Ed.), *Varieties of attention* (pp.29-61). New York: Academic Press.

Kahneman, D., & Tversky, A. (1973). On the psychology of prediction. *Psychological Review*, 80, 237-251.

Kaufman, G., & Vosburg, S. K. (1997). Paradoxical mood effect on creative problem-solving. *Cognition and Emotion, 11*(2), 151-170.

Kelley, C. M., & Jacoby, L. L. (1996). Memory attributions: Remembering, knowing and feeling of knowing. In L. M. Reder (Ed.), *Implicit memory and metacognition* (pp. 287-308). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Kelley, C. M., & Jacoby, L .L., (1993). *The construction of subjective experience*: Memory attribution. In M. Davies, & G.W. Humphreys (Eds.), *Consciouness*. Oxford, UK: Blackwell

Kelley, C. M., & Lindsay, D. S. (1993). Remembering mistaken for knowing: Ease of retrieval as a basis for confidence in answers to general knowledge questions. *Journal of Memory and Language, 32*(1),1-24

.

Kelman, H. C. (1961). Processes of opinion change. *Public Opinion Quarterly, 25*, 57-78.

Kim, H. & Baron, R. S. (1988). Exercise and the illusory correlation: Does arousal heighten stereotypic processing? *Journal of Experimental Social Psychology, 24*, 366-380.

Kirk, R. E. (1982). *Experimental design: Procedures for the behavioral sciences* (2nd ed.). Monterey, CA: Brooks /Cole.

Kirkpatrick, L. A., & Epstein, S. (1992). Cognitive-experiential self-theory and subjective probability: Further evidence for two conceptual systems. *Journal of Personality and Social Psychology, 63*(4),534-544.

Kirsner, K., & Smith, M. C. (1974). Modality effects on word identification. *Memory and Cognition, 2*, 637-640.

Klinger, M. R., & Greenwald, A. G. (1994). Preferences need no inferences?: The cognitive basis of unconscious mere exposure effects. In P. M. Niedenthal, & S. Kitayama, (Eds.), *The heart's eye: Emotional influences in perception and attention* (pp. 67-85). San Diego, CA: Academic Press, Inc.

Kruglanski, A. W. (1989). *Lay epistemics and human knowledge: cognitive and motivational basis*. New York: Plenum.

Kruglanski, A. W. (1996). Motivated social cognition: principles of the interface. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 493-520). New York, NY: Guilford Press.

Kruglanski, A. W. (1990). Motivations for judging and knowing: Implications for causal attribution. In E. T. Higgins & R. M. Sorrentino (Eds.), *The handbook of motivation and social cognition: Foundations of social behavior* (Vol.2, pp.333-368). New York, NY: Guilford Press.

Kruglanski, A. W., & Freund, T. (1983). The freezing and un-freezing of lay-inferences: Effects on impressional primacy, ethnic stereotyping, and numerical anchoring. *Journal of Experimental Social Psychology, 19*,448-468.

Kruglanski, A. W. Freund, T., & Bar-Tal, D. (1996). Motivational affects in the mere-exposure paradigm. *European Journal of Social Psychology, 26*, 479-499

Kuhn, T. S. (1970). *The structure of scientific revolutions* (2nd ed.). Chicago: Chicago University Press.

Kuykendall, D., & Keating, J. P. (1990). Mood and persuasion: Evidence for the differential influence of positive and negative states. *Psychology and Marketing, 7*(1) 1-9.

LaBerge, D., & Samuels, S. J. (1974). Towards a theory of automatic information processing in reading. *Cognitive Psychology*, 6, 293-323.

Laird, J. D. (1984). Self attribution of emotion: The effect of expressive behavior on the quality of emotional experience. *Journal of Personality and Social Psychology , 29,* 457-486.

Laird, J. D. Wegner, J. J., Halal, M., & Szegda, M. (1982). Remembering what you feel: The effect of emotion on memory. *Journal of Personality and Social Psychology, 42*, 646- 657.

Lakoff, G. (1987). Women, fire, and dangerous things: What categories reveal about the mind. Chicago: University of Chicago Press.

Larsen, R.J., & Kasimatis, M. (1990). Individual differences in entertainment of mood to the weekly calendar. *Journal of Personality and Social Psychology*, *58*, 164- 171.

Lassiter, G. D., Koenig, L. J., & Apple, K. J. (1996). Mood and behavior perception: Dysphoria can increase and decrease effortfull processing of information. *Personality and Social Psychology Bulletin, 22*(8), 794-810.

Lazarus, R. S. (1982). Thoughts and relations between emotion and cognition. *American psychologist, 37*, 1019-1024.

Lindman, H. R. (1974). *Analysis of variance in complex experimental designs*. San Francisco, CA: Holden-Day.

Locksley, A., Stangor, C., Hepburn, C., Grosovsky, E., & Hochstrasser, M. (1984). The ambiguity of recognition memory tests of schema theory. *Cognitive Psychology, 16*, 421- 448.

Lockhart, R. S., Craik, F. I., & Jacoby, L. L. (1976). Depth of processing, recognition and recall. In J. Brown (Ed), *Recall and recognition* (pp75-102). Bath, England: John Wiley, & Sons.

Logan, G. D. (1991). Automaticity and memory. In W. E. Hockley, & S. Lewandowsky (Eds.), *Relating theory and data: Essays on human memory in honour of Bennet B. Murdock* (pp. 347-366). Hillsdale, NJ: Lawrence Erlbaum Associates Inc

Logan, G. D. (1989). Automaticity and cognitive control. In J. S. Uleman, & J. A. Bargh (Eds.), *Unintended thought* (p.52-74). New York, NY: Guilford .

Logan, G. D. (1988). Towards an instance theory of automatization. *Psychological Review, 95*, 492- 527.

Logan, G. D., & Cowan, W. B. (1984). On the ability to inhibit thought and action: A theory of an act of control. *Psychological Review, 91*(3), 295-327.

Macaulay, D. Ryan, L., & Eich, E. (1993). Mood dependence in implicit and explicit memory. In Peter Graf, & Michael E. J. Masson, (Eds.), *Implicit memory: New directions in cognition, development, and neuropsychology* (pp. 75-94.). Hillsdale, NJ Lawrence Erlbaum Associates Inc.

Mackie, D. M., Asuncion, A. G., & Rosselli, F.(1992). The impact of positive affect on persuasion processes. In M. S. Clark (Ed), *Emotion and social behavior. Review of personality and social psychology,* (Vol. 14, pp. 247-270). Newbury Park, CA: Sage Publications.

Mackie, D., Hamilton, D., Schroth, H. A., Carlisle, C. J., Gersho, B. F., Meneses, L. M., Nedler, B. F., & Reichel, L. D. (1989). The effects of induces mood on expectancy-based illusory correlation's. *Journal of Experimental Social Psychology, 25 (6)*, 524-544.

Mackie, D., & Worth, L. T. (1991). "Feeling good but not thinking straight": Positive mood in persuasion. In J. P. Forgas (Ed.), *Emotion and social judgments* (pp. 201-220) Oxford: Pergamon.

Mackie, D., & Worth, L. T. (1989). Processing deficits and the mediation of positive affect in persuasion. *Journal of Personality and Social Psychology, 57,* 27-40.

Manaucia, G. K., Bauman, D. J., & Cialdini, R. B. (1984). Mood influences on helping: Direct effects or side effects? *Journal of Personality and Social Psychology, 46*, 357-364.

Mandler, G. (1997). Consciousness redux. In J. D. Cohen, & J. W. Schooler (Eds.), Scientific approaches to consciousness (pp. 469-498). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Mandler, G. (1991). Your face looks familiar but I can't remember your name: A review of dual process theory. In W. E. Hockley, & Stephan Lewandowsky (Eds.), *Relating theory and data: Essays on human memory in honor of Bennet B. Murdock* (p. 207-225). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc,.

Mandler, G.(1981). The recognition of previous encounters. *American Scientist, 69* (2), 211-218.

Mandler, G. (1980). Recognizing: The judgment of previous occurrence. *Psychological Review*, 87, 252-271.

Mandler, G. (1979). Organizing and repetition: Organizational principles with special reference to rote learning. In L. G. Nilsson (Ed.), *Perspectives on memory research* (pp.293-327). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Mandler, G. (1975). *Mind and emotion*. New York: Wiley.

Mandler, G. (1962). From association to structure. *Psychological Review*, *69*, 415-427.

Mandler, G., Hamson, C. O., & Dorfman, J. (1990) Tests of dual process theory: Word priming and recognition. *Quarterly Journal of Experimental Psychology: Human Experimental Psychology,42A* (4), 713-739.

Mandler, G., Nakamura, Y., & Van Zandt, B. J. S. (1987). Nonspecific effects of exposure on stimuli that cannot be recognized. *Journal of Experimental Psychology: Learning, Memory and Cognition, 113*, 646-648.

Markus, H., Smith, J., & Moreland, R. L. (1985). Role of self-concept in the percetion of other. *Journal of Personality and Social Psychology, 49*, 1494-1512.

Markus, H., & Zajonc, R. B. (1985). The cognitive perspective in social psychology. In G. Lindzey, & E. Aronson (Eds.), *The handbook of social psychology* (pp.137-230). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Martin, L. L., Achee, J. W., Ward, D.W., & Harlow, T. F. (1993). The role of cognition and effort in the use of emotions to guide behavior. In R. S. Wyer, & T. K. Srull (Eds.), *Advances in social cognition* (Vol.6, pp. 147-157). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Martin L. L., & Stoner, P. (1996). Mood as input: What we think about how we feel determines how we think. In L. L. Martin, & A. Tesser (Eds.), *Striving and feeling. Interactions among goals, affect, and self-regulation* (pp.279-301). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Martin, L. L., Ward, D. W., Achee, J. W., & Wyer, R. S. (1993). Mood as input: People have to interpret the motivational implications of their mood. *Journal of Personality and Social Psychology*, 64, 317-326.

Maheswaran, D., & Chaiken, S. (1991). Promoting systematic processing in low motivation settings: The effect of incongruent information on processing and judgments. *Journal of Personality and Social Psychology, 61*, 13-25.

McClelland, J. L., McNaughton, B. L., & O'Reilly, R. C. (1995). Why there are complementary learning systems in the systems in the hippocampus and neocortex: Insights from the success and failure of connectionist models of learning and memory. *Psychological Review, 102*(3), 419-457.

McClelland, J. J., & Rumelhart, D. E. (1981). An interactive activation model of context effects in letter perception: Part I. An account of basic findings. *Psychological Review, 88*, 375-407.

McGuire, W. J. (1968). Personality and attitude change: An information process theory. In A. G. Greenwald, T. C. Brock, & T. M. Ostrom (Eds.), *Psychological foundations of attitudes* (pp.171-196). San Diego, CA: Academic Press.

Medin, D. L., Goldstone, R. L., & Gentner, D. (1990). Similarity involving attributes and relations: Judgments of similarity and difference are not inverses. *Psychological Science, 1*(1), 64-69.

Melton, R., J. (1995). The role of positive affect on in syllogism performance. *Personality and Social Psychological Bulletin, 21*,788-194.

Newtson, D. (1973). Attribution and the unit of perception of ongoing behavior. *Journal of Personality and Social Psychology, 28*, 28-38.

Mitchell, J. F. & Madigan, R. J. (1984). The effects of induced elation and depression on interpersonal problem solving. *Cognitive Therapy and Research, 8*(3), 277-285.

Moreland, R. L., & Zajonc, R. B. (1977). Is stimulus recognition a necessary condition for the occurrence of exposure effects? *Journal of Personality and Social Psychology, 35*, 191-199.

Morris, W. N. (1992). A functional analysis of the role of mood in affective systems. In M. S. Clark (Ed.) *Review of Personality and Social Psychology* (Vol.13, pp.256-293). Newbury Park, CA: Sage Publications.

Morris, W. N. (1989). *Mood: The frame of mind.* New York: Spring-Verlag.

Murdock, B. B. (1982). A theory for storage and retrieval of item and associative information. *Psychological Review, 89,* 609-626.

Murphy, S.T. , Monahan, J. L., & Zajonc, R. B. (1995). Additivity of nonconscious affect: combined effects of priming and exposure. *Journal of Personality and Social Psychology, 69*, 589-602.

Murphy, S. T., & Zajonc, R. B. (1993). Affect, cognition, and awareness: Affective priming with optimal and suboptimal stimulus exposures. *Journal of Personality and Social Psychology, 64*, 723-739.

Murray, N., Sujan, H., Hirt, E. R., & Sujan, M. (1990). The influence of mood in categorization: A cognitive flexibility interpretation. *Journal of Personality and Social Psychology, 59*, 411-425.

Nadel, L. (1994). Multiple memory systems: What and why, an update. In D. L. Schacter, & E. Tulving, (Eds.), *Memory systems* (pp. 39-64). Cambridge, MA: MIT Press.

Nasby, W., & Yando, R. (1982). Selective encoding and retrieval of effectively valent information: Two cognitive consequences of children's mood states. *Journal of Personality and Social Psychology, 43*, 1244-1253.

Needham, D. R., & Begg, I. M. (1991). Problem-oriented training promotes spontaneous analogical transfer: Memory-oriented training promotes memory for training. *Memory and Cognition, 19*(6), 543-557

Neely, J. H. (1976). Semantic priming and retrieval from lexical memory: Evidence for facilitation and inhibitory processes. *Memory and Cognition, 4*, 648-654.

Neuberg, S. L., & Fiske, S. T. (1987). Motivational influences on impression formation: Outcome dependency, accuracy-driven attention, and individuating processes. *Journal of Personality and Social Psychology, 53*, 431-444.

Newell, A. (1973). Production systems: Models of control structures. In W. G. Chase (Ed.), *Visual information processing.* New York, N.Y.: Academic Press

Newell, A., & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall.

Newtson, D. (1973). Attribution and the unit of perception of ongoing behavior. *Journal of Personality and Social Psychology, 28*(1), 28-38.

Nhouyvanisvong, A., & Reder, L. M. (1998). Rapid feeling-of-knowing: A strategy selection mechanism. In V. Y. Yzerbyt, G. Lories, & B. Dardenne (Eds.), *Metacognition. Cognitive and social dimension* (pp.35-52). London: Sage Publications.

Niedenthal, P .M., & Setterlund, M. B (1994). Emotion congruence in perception. *Personality and Social Psychological Bulletin, 20*, 401-410.

Niedenthal, P .M., Setterlund, M. B., & Jones, D. E. (1994). Emotional organization of perceptual memory. In P. M. Niedenthal, & S. Kitayama (Eds.), *The heart's eye. Emotional influences in perception and attention*. San Diego: Academic Press.

Norman, D. A., & Rumelhart, D. E. (1975). *Explorations in cognition.* San Francisco: Freeman

Norris, D. (1984). The effects of frequency, repetition and stimulus quality in visual word recognition. *Quarterly Journal of Experimental Psychology: Human Experimental Psychology, 36A* (3),507-518.

Nowlis, V., & Nowlis, H. H. (1956). The description and analysis of mood. *Annual of New York Academy of Sciences,* 65, 345-355.

Oaksford, M., Morris, F., Grainger, B., & Williams, J. M. G. (1996). Mood, reasoning, and central executive processes. *Journal of Experimental Psychology Learning, Memory, and Cognition, 22*(2), 476-492.

Oatley, K., & Johnson- Laird, P. N. (1987). Towards a cognitive theory of emotions. *Cognition and Emotion, 1*, 29-50.

Olson, J. M. Roese, N. J. & Zanna, M. P. (1996). Expectation. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp.211-238). New York, NY: Guilford Press.

Ortony, A., Clore, G. L., & Collins, A. (1988). *The cognitive structure of emotions.* New York: Cambridge University Press.

Ottati, V. C., & Isbell, L. M. (1996). Effects on mood during exposure to target information on subsequently reported judgments: An on-line model of misattribution and correction. *Journal of Personality and Social Psychology, 71*(1) 39-53.

Owens, J., Bower, G. H., & Black, J. B.(1979). The "soap opera" effect in story recall. *Memory and Cognition,7*(3),185-191.

Palfai, T. P., & Salovey, P. (1993). The influence of depressed and elated mood on dedutive and inductive reasoning. *Imagination, Cognition, and Personality, 13*, 517-533.

Pasher, H., & Carrier, M. (1996). Structures, processes, and flow of information. In E. L. Bjork & R. A. Bjork (Eds.), *Memory* (pp. 4-25). San Diego, CA: Academic Press.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker.* New York: Cambridge University.

Petty R. E., & Cacioppo, J. T. (1990). Involvement and persuasion: Tradition versus integration. *Psychological Bulletin, 107*, 367-374.

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 124-203). San Diego, CA: Academic Press.

Petty, R. E., & Cacioppo, J. T. (1981). *Attitudes and persuasion: Classic and contemporary approaches*. Dubuque, IA: Wm. C. Brown.

Petty R. E., & Cacioppo, J. T. (1979). Issue-involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology , 37*, 1015-1926.

Petty, R. E., Schumann, D. W. Richman, S. A., & Strathman, A. J. (1993). Positive mood and persuasion: Different roles for affect under high- and low-elaboration conditions. *Journal of Personality and Social Psychology, 64*(1), 5-20.

Petty, R. E., Wells, G. L., & Brooks, T. C. (1976). Distraction can enhance or reduce yielding to propaganda: Thought disruption versus effort justification. *Journal of Personality and Social Psychology, 34*, 874-884.

Pittman,. T. S. (1992). Perception without awareness in the stream of behavior: Processes that produce and limit nonconscious biasing effects. In R. F. Bornstein, & T. S. Pittman (Eds.), *Perception without awareness* (pp. 277-296). New York, NY: Guilford Press.

Pittman, T. S. (1998). Motivation. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology*, (4th ed., Vol.1, pp. 549-590). New York, NY: McGraw-Hill.

Platt, J. R. (1964). Strong inference. *Science, 146*, 347-353.

Posner, M. I., & Snyder, C. R. R. (1975). Facilitation and inhibition in the processing of signals. In P. M. A. rabbit, & S. Dornic (Eds.), Attention and Performance V (pp.669-682). New York: Academic Press.

Queller, S. Mackie, D. M. & Stroessner, S. J. (1996). Ameliorating some negative effects of positive mood: encouraging happy people to perceive intragroup variability. *Journal of Experimental Social Psychology*, 32(4), 361-386.

Rajaram, S., & Roediger, H. L. (1993). Direct comparison of four implicit memory tests. *Journal of Experimental-Psychology Learning, Memory, and Cognition, 19*, 765-776.

Ratneshwar, S., & Chaiken, S. (1991). Comprehension's role in persuasion: The case of its moderating effect on the persuasive impact of source cues. *Journal of Consumer Research, 18*, 52-62.

Reber, A. S. (1989). Implicit learning and tacit knowledge. *Journal of Experimental Psychology: General, 118*(3), 219-235.

Reder, L. M. (1987). Strategy selection in question answering. *Cognitive Psychology*, *19*, 90-138.

Reder, L. M., & Ritter, F. E. (1992). What determine initial feeling of knowing? Familiarity with questions terms not with the answer. *Journal of Experimental Social Psychology: Learning, Memory and Cognition, 18*(3), 435-451.

Reder L. M., & Kusbit. G.W. (1991). Locus of the Moses illusion: Imperfect encoding, retrieval or match? *Journal of Memory and Language, 30*, 385-406.

Rholes, W. S., Riskind, J. D., & Lane, J. W. (1987). Emotional states and memory biases: Effects of cognitive priming and mood. *Journal of Personality and Social Psychology, 52*, 91-99.

Richards, P. M., & Ruff, R. M.(1989). Motivational effects on neuropsychological functioning: Comparison of depressed versus nondepressed individuals. *Journal of Consulting and Clinical Psychology*, 57(3), 396-402.

Richardson-Klavehn, A., & Bjork, R .A. (1988). Measures of memory. *Annual Review of Psychology, 39*, 475-543.

Roediger, H. L., & Blaxton, T. A. (1987). Retrieval modes produce dissociations in memory for surface information. In D. S. Gorfien, & R. R. Hoffman (Eds.), *Memory and cognitive processes: The Ebbinghaus centennial conference* (pp. 349-379). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Rojahn, K., & Pettigrew, T. F. (1992). Memory for schema-relevant information: A meta-analytic resolution. *British Journal of Social Psychology, 31,* 81-110.

Roseman, I. J., Spindel, M. S., & Jose, P. E. (1990). Appraisal of emotion eliciting events: Testing a theory of discrete emotions. *Journal of Personality and Social Psychology, 59*, 899-915.

Rosselli, F., Skelly, J. J., & Mackie, D. M. (1995). Processing rational and emotional messages: The cognitive and affective mediation of persuasion. *Journal of Experimental Social Psychology, 31*(2) 163-190.

Rucmick, C. A. (1936). *The psychology of feeling and emotion*. New York: McGraw-Hill.

Russel,, J. A. (1979). Affective space is bipolar. *Journal of Personality and Social Psychology, 37*, 345-356.

Russel, D. (1982). The casual dimension scale: A measure of how individuals perceive causes. *Journal of Personality and Social Psychology, 42*, 1136-1145.

Sack, D. A., & Weher, T. A. (1988). Circadina rhythms in affective disorders. In A. Georgotas, & R. Cancro (Eds.), *Depression and mania* (pp.312-331). New York: Elsevier.

Salovey, P., & Rodin, J. (1985). Cognition about the self: Connecting feeling states and social behavior. In P. Shaver (Ed.), *Self, situations, and social behavior. Review of personality and social psychology*, (Vol. 6) . Beverly Hills: Sage.

Sawyer, A. (1981). Repetition, Cognitive responses and Persuasion. In R. T. Petty, T. M. Ostrom, & T.C. Brock (Eds.), *Cognitive responses in persuasion*. Hillsdale, NJ : Lawrence Erlbaum Associates Inc.

Scarborough, D. E., Gerard, L., & Cortese, C. (1979). Accessing lexical memory: The transfer of word repetition effects across task and modality. *Memory and Cognition, 7*, 3-12.

Schachter; S., & Singer, J. (1962). Cognitive, social, and physiological determinants of emotional states. *Psychological Review, 69*, 379-399.

Schacter, D. L., & Tulving, E. (1994). What are the memory systems of 1994? In Daniel L. Schacter, & Endel Tulving, (Eds.), *Memory systems (*pp. 1-38). Cambridge, MA: MIT Press.

Schaller, M., & Cialdini, R. B. (1990). Happiness, sadness, and helping: A motivational integration. In E. T. Higgins, & R. M. Sorrentino, (Eds.), *Handbook of motivation and cognition: Foundations of social behavior (*Vol.2, pp. 265-296). New York, NY: Guilford .

Schank, R. L., & Abelson, R. P. (1977 *). Scripts, plans, goals, and human understanding: An inquiry into human knowledge structures*. Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Scherer, K. R. (1984). On the nature and function of emotion: A component process approach. In K. R. Scherer, & P. Elkman (Eds.), *Approaches to emotion* (pp.293-317). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Schmidt, H. G., & Boshuizen, H. P. (1993). On acquiring expertise in medicine. Special Issue: European educational psychology. *Educational Psychology Review*, *5*(3), 205-221.

Schneider, W. (1988). Micro Experimental laboratory: An integrated system for IBM PC compatibles. *Behavior Research Methods, Instruments and computers, 20*, 206-217.

Schunn, C. D., Reder, L. M., Nhouyvanisvong, A., Richards, D. R., & Stroffolino (1997). To calculate or not to calculate: A source activation confusion model of problem familiarity's role in strategy selection. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 23*(1), 3-29.

Schwarz, N. (1990). Feeling as information. Informational and motivational functions of affective states. In R. Sorrentino, & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (Vol.2, pp.527-561). New York: Guilford Press.

Schwarz, N., & Bless, H. (1992). Constructing reality and its alternatives : An inclusion model on assimilation and contrast effects in social judgment. In L. L. Martin, & A. Tesser (Eds.), *The construction of social judgments* (pp. 217-245). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Schwarz, N., & Bless, H. (1991). Happy and mindless, but sad and smart? The impact of affective states on analytical reason. In J. Forgas (Ed.), *Emotion and social judgments* (pp. 55-71). Oxford: Pergamon.

Schwarz, N. Bless, H., & Bohner, G. (1991). Mood and persuasion: Affective states influence the processing of persuasive communications. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 24 , pp. 161-199). San Diego, CA: Academic Press.

Schwarz, N., & Clore, G. L. (1996). Feelings and Phenomenal Experiences. In E. T. Higgins, & A. W. Kruglanski (Eds.), *Social psychology. Handbook of basic principles* (pp 433-465). New York : Guilford Press .

Schwarz, N., & Clore, G. L. (1988). How do I feel about it? The informative function of affective states. In K. Fiedler, & J. Forgas (Eds.), *Affect, cognition and social behavior* (pp. 44-62). Zurich: C. J. Hogrefe.

Schwarz, N., & Clore, G. L. (1983). Mood misattribution, and judgment of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology* ,*45*, 3, 513-523.

Sedikides, C. (1995) Central and peripheral self-conceptions are differentially influenced by mood: tests of the differential sensitivity hypothesis. *Journal of Personality and Social Psychology, 69*, 759-777.

Sedikides, C. (1994). Incongruent effects of sad mood on self-conception valence: It's a matter of time. Special Issue: Affect in social judgments and cognition. *European Journal of Social Psychology, 24*(1), 161-172

Sedikides, C. (1992). Changes in the valence of the self as a function of mood. In M. S. Clark. (Ed.), Emotion and social behavior, *Review of Personality and social psychology* (Vol.14, pp. 271-311). Newbury Park, CA: Sage Publications.

Sherer, K. R. (1984). On the nature and function of emotion: a component process approach. In K. R. Sherer, & P. Ekman (Eds.), *Approaches to emotion* (pp.293-317). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Sherman, S. J. (1987). Cognitive processes in the formation, change, and expression of attitudes. In M. P. Zanna , J.M. Olson and C. P. Herman (Eds.), *Social influence: The Ontario Symposium* (Vol.5, pp. 75-106). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Sherman, S. J., Beike, D. R., & Ryalls, K. R. (in press). Dual-processing accounts of inconsistencies in responses to general versus specific cases. To appear in S. Chaiken, & Y. Trope (Eds.), *Dual-process models in social psychology*. New York: Guilford Press.

Sherman, S. J., Mackie, D. M., & Driscoll, D. M. (1990). Priming and the differential use of dimensions in evaluation. *Personality and Social Psychological Bulletin, 16*, 405-418.

Shields, S.A. (1984). Distinguishing between emotion and nonemotion: Judgments about experience. *Motivation and Emotion, 8*, 355-369.

Shiffrin, R. M (1997). Attention, automatism, and consciousness. In J. D. Cohen and J. W. Schooler (Eds.), *Scientific approaches to consciousness* (pp. 49-64). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Shiffrin, R. M. , & Schneider, W. (1977). Control and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. *Psychological Review, 84*, 127-190.

Siegel, J. M., Johnson, J. H., & Sarason, I. G. (1979). Mood states and the reporting of life changes. *Journal of Psychosomatic Research, 23*, 103-108.

Simon, H. A. (1982). Comments. In M. S. Clark, & S. Fiske (Eds.), *Affect and cognition : The Seventeenth Annual Carnegie Symposium on Cognition* (pp. 333-3432). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Simon, H. A.(1969). *The sciences of the artificial*. Cambridge, Mass: MIT Press.

Simon, H. A. (1967). Motivational and emotional controls of cognition. *Psychological Review, 74*, 29-39.

Simon, H. A (1957). *Models of Man*. New York: Wiley.

Sinclair, R. C., & Mark, M. M. (1992). The influence of mood state on judgment and action : Effects on persuasion categorization, social justice, person perception, and judgmental accuracy. In L. L. Martin, & A. Tesser (Eds.), *The construction of social judgments* (pp.165-193). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Sinclair, R. C., Mark, M. M., & Clore, G. L. (1994). Mood-related persuasion depends on (mis)attributions. *Social Cognition, 12* (4) 309-326.

Singer, J. A., & Salovey, P. (1988). Mood and memory: Evaluating the network theory of affect. *Clinical Psychological Review, 8*, 211-251.

Sloman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin*, 119, 3-22.

Smith, E. E., Shoben, E. J., & Rips, L. J. (1974). Structure and process in semantic memory: A featural model for semantic decisions. *Psychological Review, 81* (3), 214-241.

Smith, E. R. (1994). Procedural knowledge and processing strategies in social cognition. In R. S. Wyer, & T. K. Srull (Eds.), *Handbook of social cognition* (2nd ed., Vol.1, pp. 99-151). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Smith, E. R. (1988). Category accessibility effects in a simulated exemplar-based memory. *Journal of Experimental Social Psychology , 24*, 448-463.

Smith, E. R., & Branscombe, N. R. (1988). Category accessibility as implicit memory. *Journal of Experimental Social Psychology, 24*, 490-504.

Smith, E. R., & Branscombe, N. R. (1987). Procedurally mediated social inferences: The case of category accessibility effects. *Journal of Experimental Social Psychology, 23*, 361-382.

Smith, E. R., Branscombe, N. R., Bormann,, C. (1988). Generality of effects of practice on social judgments tasks. *Journal of Personality and Social Psychology , 54*, 385-395.

Smith, E. R., & DeCoster, J. (in press). Heuristic-Systematic and other dual-process models in Social and Cognitive Psychology: An integration and connectionist interpretation. *Psychological Review*.

Smith, E. R., Stewart, T. ,L., & Buttram, R.T. (1992). Inferring a trait from a behavior has long-term, highly specific effects. *Journal of Personality and Social Psychology, 62*, 753-759.

Smith, E. R., & Zarate, M. A, (1992). Exemplar-based model or social judgment. *Psychological Review*, *99*, 3-21.

Smith, S. M., & Shaffer, D. R. (1991). Good mood and the inhibition of systematic processing: "Willing but not able, or able but not willing?" *Motivation and emotion, 15*, 243-279.

Solokov, E. N. (1963). Higher nervous functions: The orienting reflex. *Annual Review of psychology, 25,* 545-580.

Srinivas, K. Roediger, H. L.(1990). Classifying implicit memory tests: Category association and anagram solution. *Journal of Memory and Language,29* (4), 389-412.

Srull, T. K. (1981). Person memory: Some tests of associative storage and retrieval models. *Journal of Experimental Psychology: Human Learning and Cognition, 7*, 440-462.

Srull, T. K., & Wyer, R. S., Jr. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology*, 37, 1660-1672.

Stang, D. J. (1974) . Methodological factors in mere exposure research. *Psychological Bulletin*, 81, 1014-1025

Stangor, C., & McMillan, D. (1992). Memory for expectancy-congruent and expectancy-incongruent information: A review of the social and developmental literatures. *Psychological Bulletin*, *111*, 42-61.

Stepper, S., & Strak, F. (1993). Proprioceptive determinants of emotional and nonemotional feelings. *Journal of Personality and Social Psychology*, 64, 211-220.

Strack, F., Martin, L. L., & Stepper, S. (1988). Inhibiting and facilitating conditions of the human smile: A nonobstrusive test of the facial feedback hypothesis. *Journal of Personality and Social Psychology* , *54*, 768-777.

Strack, F., Martin, L. L., & Schwarz, N. (1988). Priming and communication: social determinants of information use in judgments of life satisfaction. *European journal of Social Psychology, 18*, 429- 442.

Strack, F., Schwarz, N., & Gschneidinger, E. (1985). Happiness and reminiscing: the role of time perspective, affect, and mode of thinking. *Journal of Personality and Social Psychology*, 49, 6, 1460-1469.

Stroessner, S. J., & Mackie, D. M. (1993). Affect and perceived group variability: Implications for stereotyping and prejudice. In D. M. Mackie, & D. L. Hamilton (Eds.), *Affect cognition , and stereotyping. Interactive processes in group perception* (pp.63- 83). New York, NY: Academic Press.

Stroessner, S. J., & Mackie, D. M. (1992). The impact of induced affect on the perception of variability in social groups. *Personality and Social Psychological Bulletin, 18* (5), 546-554.

Stroessner, S. J., Hamilton, D. L., & Mackie, D. M. (1992). Affect and stereotyping: The effect of induced mood on distinctiveness-based illusory correlations . *Journal of Personality and Social Psychology, 62* (4) 564-576.

Sullivan, M. J. L., & Conway, M. (1989). Negative affect leads to low effort cognition: Attributional processing for observed social behavior. *Social Cognition, 7*, 315-337.

Sutherland, G., Newman, B., & Rachman, S. (1982). Experimental investigations of the relations between mood and intrusive unwanted cognitions. *British Journal of Medical Psychology, 55* (2), 127-138.

Teasdale, J. D., & Fogarty, J. (1979). Differential effects of induce mood on retrieval of pleasant and unpleasant events from episodic memory. *Journal of Abnormal Psychology* , *88*, 248-257.

Tesser, A., & Shaffer, D. R. (1990). Attitudes and attitudes change. *Annual review of Psychology, 41*, 479-523.

Truax, S. R. (1984). Determinants of emotion attributions: A unifying view. *Motivation and Emotion, 8*(1), 33-54).

Tulving, E. (1983). *Elements of episodic memory.* New York, NY: Oxford University Press.

Valins, S. (1966). Cogntive effects of false heart rate feedback. *Journal of Personality and Social Psychology, 4*, 400-408.

Velten, E. (1968). A laboratory task for induce mood states. *Behavior Research and therapy, 6*, 473-482.

von Hippel, W., Jonides, J. , Hilton, J. L., & Sowmya, N. (1993). The inhibitory effect of schematic processing on perceptual encoding. *Journal of Personality and Social Psychology*, 64, 921-935.

Wason (1966). Reasoning. In B. M. Foss (Ed.), *New horizons in psychology* (Vol.1, pp. 135- 152). Harmondsworth: Penguim Books.

Wegener, D. T., & Petty, R. E. (1996). Effects of mood on persuasion processes: Enhancing, reducing, and biasing scrunity of attitude-relevant information. In L. L. Martin, & A. Tesser (Eds.), *Striving and feeling. Interactions among goals, affect, and self- regulation*, (pp. 329- 362). Mahway, NJ: Lawrence Erlbaum Associates Inc.

Wegener, D. T., & Petty, R. E. (1994). Mood management across affective states: the hedonic contingency hypothesis. *Journal of Personality and Social Psychology, 66*, 1034-1048.

Wegener, D. T., Petty, R. E., & Smith, S. M. (1995). Positive mood can increase or decrease message scrutiny: The hedonic contingency view of mood and message processing. *Journal of Personality and Social Psychology, 69* (1), 5-15.

Wehr, T. A., & Rosenthal, N. E. (1989). Seasonality and affective illness. *American Journal of Psychiatry*, 146, 829-839.

Weiner, B. (1985). "Spontaneous" causal reasoning. *Psychological Bulletin*, 97, 74-84.

Wenzlaff, R. M., Wegner, D. M., & Klein, S.B. (1991). The role of thought suppression in the boding of thought and mood. *Journal of Personality and Social Psychology, 60*, 500-508.

Westermann, R., Spies, K., Stahl, G., & Hesse, F.W. (1996). Relative Effectiveness and Validity of Mood induction procedures: a meta-analysis. *European Journal of Social Psychology*, 26 (4), 557-580.

Whyte, L. L., (1960). *The unconscious before Freud.* New York: Basic Books.

Wilcox, R. R. (1998). How many discoveries have been lost by ignoring modern statistical methods? *American Psychologist, 53*(3), 300-314.

Wilder, D. A. (1993) The role of anxiety in facilitating stereotypic judgment of outgroup behavior. In D. M. Mackie, & D. L. Hamilton (Eds.), *Affect cognition , and stereotyping. Interactive processes in group perception* (pp.87-90). New York: Academic Press.

Wilder, D. A. (1978). Effects of predictability on units of perception and attribution. *Personality and Social Psychological Bulletin, 4,* 281-284.

Williams, B. A. (1980). Contrast, signaled reinforcement, and the relative law of effect. *American Journal of Psychology, 93* (4), 617-629.

Wiseman, D.; Levin, I. P. (1995). A new laboratory method for altering Positive affect. *Psychological Reports, 76* (3, Pt. 2), 1103-1106.

Witherspoon, D., & Allan, L. G. (1985). Time judgments and the repetition effect in perceptual identification. *Memory and Cognition ,13*, 101-111.

Wood, J. V., Saltzberg, J. A., & Goldamna, L. A. (1990). Does affect induce self-focus attention? *Journal of Personality and Social Psychology, 58*, 899-908.

Wood, W. (1982). Retrieval of attitude-relevant information from memory: effects on susceptibility to persuasion and intrinsic motivation. *Journal of Personality and Social Psychology, 49*, 798-810.

Worth, L. T., & Mackie, D. M. (1987). Cognitive mediation of positive affect in persuasion. *Social Cognition, 5*, 76-94.

Wright, R., & Brehm, J. W. (1989). Energization and goal attractiveness. In L. A. Pervin (Ed.), *Goal concepts in personality and social psychology* (p. 169-210). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Wyer, R. S., Jr., & Carlston, D. E. (1979). *Social cognition, inference, and attribution*. Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Wyer, R. S. & Srull, T. K. (1989). *Memory and cognition in its social context.* Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Yonelinas, A. P. (1994). Receiver-operating characteristics in recognition memory: Evidence for a dual-process model. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 20* (6), 1341-1354.

Yonelinas , A. P., & Jacoby, L. L.(1995). The relation between remembering and knowing as bases for recognition: Effects of size congruency. *Journal of Memory and Language,* 34(5), 622-643

Yonelinas, A. P. Regehr , G., & Jacoby , L. L. (1995). Incorporating response bias in a dual-process theory of memory. *Journal of Memory and Language* 34(6) 821-835.

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American psychologist, 35,* 151-175.

Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology Monographs*, 9(2, Pt.2), 1-27.

ANEXOS

APPENDIX 1

FIRST EXPERIMENT

1.1. Pre-test: truth ratings
   1.1.1. Instructions + answer sheets
   1.1.2. Sentences / Results

1..2.Pre-test: Amusement
   1.2.1. Instructions
   1.2.2. Results

1.3. Pre-test: Mood
   1.3.1. 29 item scale
   1.3.2. 4 item scale

1.4. Test
   1.4.1. Instructions
   1.4.2. Answer sheet

1.5. Test: Reported data
   1.5.1 Truth ratings
   1.5.2 ratings of mood

INSTRUÇÕES

A totalidade de conhecimentos que temos relativamente à realidade em que vivemos atinge proporções tais, que nunca a conseguiríamos inventariar. É que mesmo quando, aparentemente desconheçamos pormenores dessa realidade, o conjunto de conhecimentos que possuímos permitem-nos acreditar ou duvidar de afirmações feitas sobre esta.

Assim, se nos disserem que o primeiro ministro da defesa chinês se chamava João Vasques, tendemos a considerar esta afirmação como falsa, mesmo desconhecendo na totalidade o nome que ocupou tal cargo.

Se nos disserem que a primeira língua europeia com que os povos do sul de África contactaram foi o português, mesmo nunca tendo visto esta afirmação ser suportada por documentos antigos, tendemos a atribuir-lhe elevada credibilidade.

E nunca tendo lido o livro do Guiness, tendemos a considerar como provavelmente verdadeira a afirmação de que o Homem mais gordo do mundo pesava mais de 220kg.

Este estudo visa estudar o que se pode designar como o fenómeno de *apesar de "não saber" esta informação "cheira-me" a verdadeira ou a falsa.*

Apresentar-lhe-emos de seguida um conjunto de **afirmações verdadeiras e falsas**- Leia cada frase com atenção e diga-nos com que confiança considera que essa afirmação é verdadeira ou falsa. Faça um circulo em torno do número que melhor representa a sua resposta, tendo em conta a seguinte escala:

1	2	3	4	5	6	7
De certeza Falso	Provavelmente Falso	Possivelmente Falso	Incerto	Possivelmente Verdadeiro	Provavelmente Verdadeiro	De certeza Verdadeiro

Desde já obrigado pela sua colaboração

Vire, por favor

1	2	3	4	5	6	7
De certeza Falso	Provavelmente Falso	Possivelmente Falso	Incerto	Possivelmente Verdadeiro	Provavelmente Verdadeiro	De certeza Verdadeiro

1.	O ovo de uma avestruz leva cerca de uma hora a cozer	1.	1	2	3	4	5	6	7
2.	A maior cidade a sul do equador é Melbourne, na Austrália	2.	1	2	3	4	5	6	7
3.	Até à cerca de 300 anos atrás comia-se apenas com os dedos	3.	1	2	3	4	5	6	7
4.	Os crocodilos dormem de olhos fechados	4.	1	2	3	4	5	6	7
5.	Um cubo de gelo aumenta o nível da água de um copo à medida que derrete	5.	1	2	3	4	5	6	7

APPENDIX 1: FIRST EXPERIMENT
APPENDIX 1.1: PRE-TEST: Truth ratings
APPENDIX 1.1.2: SENTENCES/RESULTS

Means associated with each pre-tested sentence and proportion of individuals that rate the each sentence as true (N for each sentence in between 16-20). In bold - neutral sentences selected to the study.

	TRUE VERSION	True	False	FALSE VERSION
1	O ovo de uma avestruz leva cerca de uma hora a cozer	4.11 (56%)	2.42 (0%)	O ovo de uma avestruz leva cerca de seis horas a cozer
2	A maior cidade a sul do equador é Melbourne, na Austrália	4.86 (70%)	3.13 (33%)	A maior cidade a sul do equador é Buenos Aires, na Argentina
3	Até à cerca de 300 anos atrás comia-se apenas com os dedos*	4.22 (56%)	2.29 (15%)	Até à cerca de 200 atrás anos comia-se apenas com os dedos*
4.	**Os crocodilos dormem de olhos fechados**	**4.00 (42%)**	**4.25 (56%)**	**Os crocodilos dormem de olhos abertos**
5	Um cubo de gelo aumenta o nível da água de um copo à medida que derrete	1.71 (0%)	5.50 (67%)	Um cubo de gelo não aumenta o nível da água de um copo à medida que derrete
6	A harpa tem 47 cordas e sete pedais	2.88 (30%)	3.14 (30%)	A harpa tem 27 cordas e dois pedais
7.	Henry Ford esqueceu-se de incluir a marcha-atraz no seu primeiro veiculo	3.33 (0%)	2.14 (0%)	Henry Ford esqueceu-se de incluir travões no seu primeiro veiculo
8.	**A estátua do Cristo-Rei tem 28m de altura**	**5.11 (58%)**	**4.71 (52%)**	**A estátua do Cristo-Rei tem 38m de altura**
9.	Um ano luz corresponde a 10 biliões de kms	3.85 (15%)	4.00 (56%)	Um ano luz corresponde a 10 triliões de kms
10.	**Duas mãos direitas juntas eram o símbolo da amizade para os romanos**	**4.78 (56%)**	**4.71 (58%)**	**Uma mão direita e esquerda juntas eram o símbolo da amizade para os romanos**
11.	O coração da cobra localiza-se a cerca de metade da distancia entre a sua cabeça e a cauda	3.57 (15%)	3.75 (23%)	O coração da cobra localiza-se a cerca de um quinto da distancia entre a sua cabeça e a cauda
12.	"Mackintosh" em 1924 designava um tipo de tecido sedoso transparente	2.14 (15%)	2.87(10%)	"Mackintosh" em 1924 designava um tipo de tecido impermeável vulcanizado
13.	A altitude máxima média a que voa um avião, não vai além dos 15 km	3.33 (33%)	3.57 (30%)	A altitude máxima média a que voa um avião, não vai além 10 km
14.	Apenas 50% do calor energético da gasolina é aproveitado para mover o automóvel.	3.85 (15%)	3.37 (23%)	Apenas 20% do calor energético da gasolina é aproveitado para mover o automóvel
15.	O recorde de salto de uma pulga é de 18 cm.	3.33 (33%)	3.71 (42%)	O recorde de salto de uma pulga é de 11 cm
16.	O gelado de cone surgiu nos EUA em 1904.	4.66 (56%)	5.71 (70%)	O gelado de cone surgiu nos EUA em 1924
17.	Pela Bíblia não se pode provar que Jesus alguma vez chorou	2.57 (15%)	3.00 (10%)	Pela Bíblia não se pode provar que Jesus alguma vez sorriu
18.	**O primeiro filme de desenhos animados é francês**	**4.44 (52%)**	**5.14 (56%)**	**O primeiro filme de desenhos animados é inglês**
19.	Os ovos de cobra são ou brancos ou creme	4.22 (33%)	5.86 (87%)	Os ovos de cobra são ou castanhos ou creme
20.	**São necessários 20 dias para que uma mosca doméstica seja bisavó**	**3.86 (42%)**	**4.00 (42%)**	**São necessários 60 dias para que uma mosca doméstica seja bisavó**
21.	O homem tem 20% mais glóbulos vermelhos no seu corpo do que a mulher	3.55 (33%)	3.28 (30%)	A mulher tem 20% mais glóbulos vermelhos no seu corpo do que o homem
22	Os dentes do siso não nascem em 60% dos seres humanos	4.86 (70%)	4.00 (35%)	Os dentes do siso não nascem em 40% dos seres humanos
23	Na época medieval eram os vidreiros quem fabricava lentes de correcção para a vista	3.67 (56%)	2.71 (15%)	Na época medieval eram os curandeiros quem fabricava lentes de correcção para a vista
24	No ano de 205 A.C os romanos instituíram uma lei que proibia as mulheres de conduzir carros de gala	3.00 (22%)	2.86 (15%)	No ano de 205 A.C os romanos instituíram uma lei que proibia as mulheres de possuir carros de gala
25.	**Nenhum lugar na terra está livre de tempestades eléctricas**	**5.55 (58%)**	**4.71 (52%)**	**Nenhum lugar na terra está livre de actividade vulcânica**
26	Para obter um kg de açafrão são necessárias 70 a 80 000 flores	4.66 (33%)	4.00 (30%)	Para obter um kg de açafrão são necessárias 700 a 800 flores
27	As zonas polares não se encontram delineadas com precisão nos mapas	4.88 (67%)	2.83 (30%)	As ilhas do Japão não se encontram delineadas com precisão nos mapas
28	**O presidente John Taylor dos EUA, adoptou 14 crianças**	**3.43 (42%)**	**3.00 (40%)**	**O presidente John Taylor dos EUA, foi pai de 14 crianças**
29	A árvore-vaca da Venezuela designa-se deste modo por produzir folhas malhadas de branco e preto com aparência de pele de vaca	5.43 (86%)	4.56 (35%)	A árvore-vaca da Venezuela designa-se deste modo por produzir um leite com aparência e gosto idêntico ao leite de vaca
30	As partículas atómicas sabem diferenciar entre direita e esquerda	3.77 (22%)	5.00 (42%)	As partículas atómicas não sabem diferenciar entre direita e esquerda
31	As borboletas têm o paladar nas patas e não na boca	4.44 (56%)	3.33 (15%)	As borboletas têm o paladar nas cavidades nasais e não na boca
32.	Os tubarões antecedem temporalmente os dinaussaros	3.67 (33%)	3.50 (30%)	Os tubarões são contemporâneos dos dinossauros
33.	Uma flor de papoila só dura 3-5 dias	3.43 (42%)	5.00 (67%)	Uma flor de papoila só dura um dia.
34	A temperatura dentro de um pepino é sempre mais quente do que do ar ambiente	3.88 (33%)	5.00 (56%)	A temperatura dentro de um pepino é sempre mais fria do que do ar ambiente
35.	**Uma joaninha recém nascida é amarela e vermelha**	**4.00 (42%)**	**4.77 (67%)**	**Uma joaninha recém nascida é cinzenta e amarela**

36	**A infecção com maior prevalência no mundo é a malária**	**3.89 (56%)**	**3.83 (42%)**	**A infecção com maior prevalência no mundo é a cólera**
37	As três cores com maior predominância nas flores são, por ordem, o branco, vermelho e azul.	4.44 (67%)	3.83 (30%)	As três cores com maior predominância nas flores são, por ordem, o vermelho, azul e branco
38	Um bébé elefante chucha com a sua tromba e não com a boca	5.00 (57%)	3.00 (10%)	Um bébé elefante chucha com a sua boca e não com a tromba
39	A profissão de arquitecto era reconhecido em Roma como a de um artista e intelectual	5.78 (90%)	3.67 (30%)	A profissão de arquitecto era tida em Roma por a de um técnico e não por a de um artista
40	Mozart escreveu uma sonata intitulada *Les Adieux*	3.43 (30%)	2.89 (10%)	Beethoven escreveu uma sonata intitulada *Les Adieux*
41.	**A maior distância a que uma bola de basebol foi lançada é de cerca de 230 metros**	**4.86 (58%)**	**4.67 (55%)**	**A maior distância a que uma bola de basebol foi lançada é de cerca de 130 metros**
42	A Igreja Metodista foi estabelecida em1698	4.00 (15%)	3.78 (10%)	A Igreja Metodista foi estabelecida em 1738
43.	Andrew Jackson foi o primeiro presidente dos EUA a andar de balão	3.57 (15%)	3.44 (10%)	Andrew Jackson foi o primeiro presidente dos EUA a andar de comboio
44	**O primeiro cão-guia para cegos foi apresentado a um cego em 1938**	**4.66 (61%)**	**3.50 (40%)**	**O primeiro cão-guia para cegos foi apresentado a um cego em 1948**
45	O preço da pituitária de porco ultrapassa os 6 contos o Kg	3.67 (33%)	3.50 (42%)	O preço da pituitária de porco ultrapassa os 16 contos o Kg
46	Os chineses inventaram uma moeda de pagamento de favores e protecção aos mortos	3.44 (22%)	4.50 (30%)	Os moris inventaram uma moeda de pagamento de favores e protecção aos mortos
47	A porta giratória foi inventada no Norte de África	5.17 (58%)	3.56 (35%)	A porta giratória foi inventada nos Estados Unidos da América
48	Apenas cerca de 3% da energia de uma lâmpada eléctrica resulta em luz	3.33 (10%)	4.16 (58%)	Apenas cerca de 40% da energia de uma lâmpada eléctrica resulta em luz
49	As avestruzes não enterram a cabeça na areia	2.00 (10%)	6.00 (70%)	As avestruzes enterram a cabeça na areia
50.	**A primeira bandeira da Confederação nos EUA designava-se "Estrelas e Linhas"**	**5.11 (42%)**	**5.00 (55%)**	**A primeira bandeira da Confederação nos EUA designava-se "Antiga Glória"**
51.	Cabelos e unhas crescem em cadáveres	6.43 (86%)	4.44 (55%)	Cabelos e unhas não crescem em cadáveres
52	O lago Itasca em Michigan é a nascente do rio Mississipi	4.28 (15%)	4.22 (35%)	O lago Itasca em Minnesota é a nascente do rio Mississipi
53.	A distância de Cucujães a Lisboa é de 123 km.	3.57 (30%)	3.78 (35%)	A distância de Cucujães a Lisboa é de 283 km
54.	**A Etiópia tem apresentado nos últimos anos as taxas mundiais mais baixas de suicídio**	**4.28 (42%)**	**4.44 (42%)**	**O Egipto tem apresentado nos últimos anos as taxas mundiais mais baixas de suicídio**
55	O carvalho através das suas folhas numa semana de verão, pode perder até 560 litros em humidade.	4.00 (30%)	4.55 (67%)	O carvalho através das suas folhas num único dia de verão, pode perder até 560 litros de humidade
56	A cortina de fogo, para camuflar o andamento de tropas, foi inventada em 1943	4.12 (30%)	3.55 (35%)	A cortina de fogo, para camuflar o andamento de tropas, foi inventada em 1923
57	Devido à iluminação artificial, caí na terra por hectare, em média, cerca de 2,5 kg de nitrogénio	4.00 (22%)	4.00 (42%)	Devido às chuvas intensas, caí na terra por hectare, em média, cerca de 2,5 kg de nitrogénio
58.	A primeira mulher a receber uma medalha na Força Aérea mundial foi uma enfermeira americana	5.25 (89%)	4.85 (70%)	A primeira mulher a receber uma medalha na Força Aérea mundial foi uma enfermeira alemã
59.	O maior estádio do mundo é a de Kharkov na Rússia	5.14 (70%)	2.22 (0%)	A maior prisão do mundo é o de Kharkov na Rússia
60	A raposa põe uma pata ao lado da outra deixando duas linhas de pegadas	3.86 (42%)	3.77 (35%)	A raposa põe uma pata à frente da outra deixando uma única linha de pegadas
61	O melhor modo de retirar um insecto do ouvido é enche-lo de vapor de água	5.00 (70%)	3.67 (35%)	O melhor modo de retirar um insecto do ouvido é enche-lo com água tépida
62.	**A máxima velocidade atingida por um réptil em terra é de 66km/hora.**	**4.14 (58%)**	**4.33 (55%)**	**A máxima velocidade atingida por um réptil em terra é de 46km/hora**
63.	Um dente partido necessita de ser lavado para poder ser recolocado no lugar	3.71 (30%)	2.44 (10%)	Um dente partido não poderá ser recolocado no lugar se for lavado
64.	O jogo de voleibol foi inventado por William G.Morgan em 1895	4.12 (33%)	5.14 (70%)	O jogo de badminton foi inventado por William G Morgan em 1895
65	**Os selos de via aérea foram pela primeira vez emitidos em 13 de maio,1918**	**4.38 (56%)**	**4.71 (58%)**	**Os selos de via aérea foram pela primeira vez emitidos em 13 de maio,1926**
66	**O numero de rotações de uma máquina de lavar roupa pode ir de 500 a 1100 por minuto**	**4.50 (42%)**	**4.57 (58%)**	**O numero de rotações de uma máquina de lavar roupa pode ir de 500 a 1100 por minuto**
67	O consumo de sódio aconselhado a um adulto, é de 800 mg por dia	4.14 (30%)	3.89 (35%)	O consumo de cálcio aconselhado a um adulto, é de 800 mg por dia
68.	Bioquimicamente o colesterol é um álcool ao qual se fixa um ácido gordo	5.25 (67%)	6.28 (87%)	Bioquimicamente o colesterol é um ácido gordo
69.	O moinho de vento é contemporâneo do moinho de água	4.30 (70%)	4.33 (55%)	O moinho de água é anterior ao moinho de vento
70.	**Uma ervilha não mastigada deixará vestígios nas fezes**	**3.42 (42%)**	**4.11 (42%)**	**Uma ervilha não mastigada encontrar-se-á inteira nas fezes**
71	Na Idade média designava-se o sal fino de "sal indiano"	5.42 (70%)	4.11 (35%)	Na Idade média designava-se o açúcar de "sal indiano"
72	A primeira mulher operadora de telefone foi Emma Nutt, em 1878	4.00 (22%)	4.43 (42%)	A primeira mulher operadora de telefone foi Emma Ball, em 1878
73	Uma embarcação de aço é mais leve do que uma embarcação das mesmas dimensões em madeira.	3.75 (33%)	5.71 (70%)	Uma embarcação de madeira é mais leve do que uma embarcação das mesmas dimensões sem aço.
74	Gillette é o apelido do inventor da lâmina de barbear.	6.00 (89%)	4.43 (70%)	Schik é o apelido do inventor da lâmina de barbear
75	A maior pepita de ouro encontrada até hoje pesava cerca de 20 kg	4.57 (70%)	3.11 (0%)	A maior pepita de ouro encontrada até hoje pesava cerca de 67 kg
76	**O preço mais elevado alguma vez pago por uma orquídea**	**4.29 (58%)**	**4.00 (42%)**	**O preço mais elevado alguma vez pago por uma orquídea foi**

	foi de 50 contos, em 1906 por Mrs Sanders de Londres.			de 500 contos, em 1906 por Mrs Sanders de Londres
77	Desde o século sétimo antes de Cristo que se faziam dentaduras artificiais com dentes de cadáveres e de animais.	3.89 (33%)	4.71 (87%)	Desde o século sétimo depois de Cristo que se faziam dentaduras artificiais com dentes de cadáveres e de animais
78	O whisky de milho provém de uma massa de vários cereais, sendo dois quintos de aveia	3.44 (22%)	4.86 (70%)	O whisky de milho provém de uma massa de vários cereais, sendo dois quintos de milho
79.	Em Portugal as emissões de dióxido de enxofre por habitante e por ano, atinge os 5 kg.	3.86 (0%)	4.11 (35%)	Em Portugal as emissões de dióxido de enxofre, por habitante e por ano, atinge os 33 kg
80	É necessário refinar cerca de 45 toneladas de minério para obter uma tonelada de níquel	4.29 (30%)	4.44 (35%)	É necessário refinar cerca de 45 toneladas de minério para obter uma tonelada de urânio.
81.	A fritura em óleo consiste na criação de uma película de glúcidos coagulados e colorados .	4.29 (42%)	3.56 (42%)	A fritura em óleo consiste na criação de uma película de proteínas coaguladas e caramelização dos glúcidos
82	A flor mais pequena do mundo encontra-se no Japão e mede meio milímetro	4.14 (42%)	4.67 (53%)	A flor mais pequena do mundo encontra-se no Brasil e mede 1milímetro
83	O primeiro piano foi construído na Áustria em 1709	5.00 (61%)	5.11 (58%)	O primeiro piano foi construído em Itália em 1709
84	O México tem 38 estados mais um distrito capital, federal	4.00 (42%)	3.56 (23%)	O México tem 28 estados mais um distrito capital, federal
85	De todas as "Monas Lisas" existentes apenas uma tem autoria atribuída a Leonardo de La Vinci	3.29 (30%)	6.11 (89%)	De todas as "Monas Lisas" existentes apenas duas têm autoria atribuída a Leonardo de La Vinci
86	A pata dianteira de um texugo é maior do que a traseira	3.56 (22%)	3.71 (15%)	A pata traseira de um texugo é maior do que a dianteira
87	Uma lata média vazia com tampa é recomendada como equipamento de sobrevivência no montanhismo	2.89 (0%)	2.86 (15%)	Uma caixa de papelão vazia com tampa é recomendada como equipamento de sobrevivência no montanhismo
88	As unhas dos dedos dos pés crescem mais rapidamente do que as das mãos	5.00 (58%)	2.44(0%)	As unhas dos dedos das mãos crescem mais rapidamente do que as dos pés
89	As balizas do pólo aquático têm 2 metros de largura	3.43 (42%)	4.11 (42%)	As balizas do pólo aquático têm 3 metros de largura
90	Uma ratazana pode ter cerca de 50 crias por ano	4.44 (56%)	5.28 (87%)	Uma ratazana pode ter cerca de 70 crias por ano
91	O sangue do corpo humano completa um circuito de 23 em 23 segundos	4.43 (58%)	3.89 (42%)	O sangue do corpo humano completa um circuito de 23 em 23 minutos
92	As ovelhas têm três vezes mais glóbulos vermelhos do que o ser humano	3.00 (0%)	4.71 (58%)	O ser humano têm três vezes mais glóbulos vermelhos do que a ovelha
93	As cascavéis não dão à luz as suas crias. Elas põem ovos	2.00 (15%)	6.44 (89%)	As cascavéis não põem os seus ovos. Elas dão à luz as suas crias
94	Para que os soalhos parem de ranger deita-se pó-de-talco entre as tábuas	2.56 (10%)	3.29 (15%)	Para que os soalhos parem de ranger deita-se leite entre as tábuas
95	O soutien só surgiu no inicio do século XX	5.56 (89%)	3.43 (30%)	O soutien só surgiu no inicio do século XV
96	A graduação do vinho da Madeira situa-se entre os 20 e 22 graus	4.71 (42%)	4.67 (67%)	A graduação do vinho da Madeira situa-se entre os 18 e 20 graus
97	Para limpar a maioria das nódoas deve-se utilizar água morna	2.57 (15%)	4.78 (78%)	Para limpar a maioria das nódoas deve-se utilizar água fria
98	A foca fêmea recusa-se a comer na época de acasalamento que vai de Março a Agosto	3.71 (30%)	3.56 (10%)	A foca macho recusa-se a comer na época de acasalamento que vai de Março a Agosto
99	O monóxido de carbono não se encontra entre os sete principais poluentes da atmosfera	6.00 (86%)	1.89 (0%)	O monóxido e dióxido de carbono encontram-se entre os sete principais poluentes da atmosfera
100	A Casa Branca tem mais de 100 quartos	5.89 (100%)	4.86 (58%)	A Casa Branca tem menos de 100 quartos
101	O benzeno é um diluente que ataca o sistema nervoso e pode causar leucemia	3.25 (25%)	3.13 (35%)	O benzeno é um diluente que ataca o sistema imunológico e pode causar paralisia
102	O organismo humano sintetiza metade da quantidade de vitamina K necessária	3.50 (50%)	3.50 (44%)	O organismo humano sintetiza quase a totalidade de vitamina K necessária
103	O primeiro semáforo foi colocado nos EUA e era apenas vermelho e verde	4.38 (50%)	3.38 (44%)	O primeiro semáforo foi colocado nos EUA e era vermelho, branco e verde
104.	A expressão "peste negra" tem a sua origem no aspecto físico do doente, visto que a pele seca e escurece assinalando a morte.	4.56 (56%)	5.25 (59%)	A expressão "peste negra" tem a sua origem na utilização da palavra "negra" como significado de "terrível"
105	A baleia azul, pesando cerca de 100 toneladas necessita de 40 kg de alimento diário.	5.11 (56%)	5.13 (59%)	A baleia azul, pesando cerca de 100 t necessita apenas de 4 t de alimento diário
106	A cerveja fabricada desde A.C. foi gaseificada a partir do século X	4.00 (33%)	3.38 (13%)	A cerveja fabricada desde A.C. foi gaseificada a partir do século XIX
107	O estado de Massachsetts dos EUA, tem o dobro de tamanho da Dinamarca	3.44 (22%)	4.63 (50%)	A Dinamarca tem o dobro de tamanho do estado de Massachusetts dos EUA
108	A água do corpo humano não tem papel na sua regulação térmica	6.22 (89%)	2.50 (25%)	A água do corpo humano tem um papel importante na sua regulação térmica
109	A bazuca foi desenvolvida pelo exercito americano e utilizada pela primeira vez em 1922	4.11 (22%)	4.13 (38%)	A bazuca foi desenvolvida pelo exercito americano e utilizada pela primeira vez em 1942
110	As traças têm cerca de 1 centímetro de comprimento	4.67 (56%)	5.25 (65%)	As traças têm cerca de 6 milímetros de comprimento
111	Uma dona de casa lava em média 2,5 milhões de artigos de cozinha na sua vida.	4.75 (53%)	5.38 (58%)	Uma dona de casa lava em média 2,5 milhões de artigos de vestir na sua vida.
112	Numa colher de chá cabem mais de dezoito baratas recém-nascidas.	5.00 (50%)	4.13 (23%)	Numa colher de chá cabem mais de 38 baratas recém-nascidas.
113	Noah Webster demorou 20 anos a fazer o seu famoso	4.25 (38%)	4.13 (35%)	Noah Webster demorou 40 anos a fazer o seu famoso dicionário

	dicionário de língua inglesa			de língua inglesa
114	O comprimento total dos vasos sanguíneos do nosso corpo perfazem mais de 95 mil km	3.38 (25%)	4.38 (55%)	O comprimento total dos vasos sanguíneos do nosso corpo perfazem cerca de 45 mil km
115	As pessoas podem falar sem fazer vibrar as cordas vocais	3.50 (50%)	6.13 (89%)	As pessoas não podem falar sem fazer vibrar as cordas vocais
116	O mel contém dois tipos de açúcar: glucose e levulose	4.22 (33%)	3.88 (38%)	O mel contém dois tipos de açúcar: dextrose e levulose
117	Para fazer uma camisola de caxemira é necessário tosquiar 10 cabras	3.56 (22%)	3.38 (25%)	Para fazer uma camisola de caxemira é necessário tosquiar 40 cabras
118	No decurso de um dia normal produzimos mais de 250ml de saliva	4.11 (33%)	4.63 (38%)	No decurso de um dia normal produzimos mais ou menos 950ml de saliva
119	Stephen Foster, escritor da letra de canções muito famosas morreu com 38 anos pobre e alcoólico	4.75 (50%)	4.25 (35%)	Stephen Foster, escritor da letra de canções muito famosas morreu com 42 anos pobre e alcoólico
120	As unhas das mãos não crescem todas as mesmo ritmo, sendo a do dedo médio a mais rápida	4.50 (50%)	3.13 (35%)	As unhas das mãos não crescem todas as mesmo ritmo, sendo a do dedo indicador a mais rápida
121	**É da ordem das centenas de milhões o número de espermatozóides expelidos durante o orgasmo masculino**	**4.88 (63%)**	**4.88 (58%)**	**É da ordem das centenas de milhares o número de espermatozóides expelidos durante o orgasmo masculino**
122	As pestanas e os pelos das sobrancelhas têm a duração de alguns anos	2.44 (0%)	3.88 (38%)	As pestanas e os pelos das sobrancelhas têm a duração de alguns meses
123	Os nossos ossos têm uma força compressora superior à do mármore e betão	2.88 (13%)	4.57 (50%)	Os nossos ossos têm uma força compressora inferior à do mármore e betão
124	O Chile é o país onde se verificou o maior número de tremores de terra	4.63 (50%)	5.00 (88%)	O Japão é o país onde se verificou o maior número de tremores de terra
125	O ser humano tem cerca de 630 músculos	3.63 (13%)	3.71 (63%)	O ser humano tem cerca de 630 ossos
126	Os coreanos têm menos glândulas odoríferas na sua pele do que qualquer outro povo	2.25 (13%)	5.57 (88%)	Os coreanos têm igual numero de glândulas odoríferas na sua pele ao de qualquer outro povo
127	A tribo dos zulus na África do Sul tem cerca de 8,35 milhões de membros	3.50 (25%)	4.14 (25%)	A tribo dos zulus na África do Sul tem cerca de 8,35 milhares de membros
128	**A cólera apenas desapareceu da Europa no século XX**	**4.13 (48%)**	**4.25 (53%)**	**A cólera apenas desapareceu da Europa no século XIX**
129	O trigo deve ser cultivado dois anos seguidos no mesmo terreno	4.83 (50%)	3.25 (38%)	O trigo não deve ser cultivado dois anos seguidos no mesmo terreno
130	A pimenta um condimento muitíssimo apreciado passa de moda em 1650	3.38 (38%)	2.14 (0%)	A pimenta um condimento muitíssimo apreciado passa de moda em 1860
131	A população do mundo está a aumentar à proporção de 500 indivíduos por hora	3.88 (38%)	3.75 (38%)	A população do mundo está a aumentar à proporção de 500 indivíduos por dia
132	A quantidade média de água da chuva que cai na terra, por segundo, é de 18 toneladas	2.75 (0%)	4.50 (50%)	A quantidade média de água da chuva que cai na terra por hora, é de 18 toneladas
133	O maior terminal de autocarros do mundo é o de Port Authority em Chicago	5.25 (88%)	4.38 (25%)	O maior terminal de autocarros do mundo é o de Port Authority em Nova York
134	Alexandre I, Czar da Rússia, foi três vezes vencido por Napoleão	3.63 (0%)	5.00 (63%)	Alexandre I, Czar da Rússia, nunca foi vencido por Napoleão
135	Na Grécia 20% dos dentistas são do sexo feminino	3.38 (13%)	4.50 (38%)	Na Grécia 50% dos dentistas são do sexo feminino
136	O tempo de vida normal de um canário é de 12 anos	3.63 (38%)	3.00 (25%)	O tempo de vida normal de um canário é de 20 anos
137	Angola é a quinta potência africana em grandeza territorial	5.14 (86%)	5.13 (88%)	Angola é a sétima potência africana em grandeza territorial
138	É a pulga macho que é utilizada para exibição de saltos em circos e não a fêmea	3.88 (25%)	3.38 (25%)	É a pulga fêmea que é utilizada para exibição de saltos em circos e não a macho
139	Os caminhos de ferro da Grécia têm uma extensão de cerca de 1800 Km	4.88 (75%)	3.38 (13%)	Os caminhos de ferro da Bélgica têm uma extensão de cerca de 1800 Km
140	A aranha tem uma duração média de cerca de dois anos	3.88 (38%)	5.14 (88%)	A aranha tem uma duração média de cerca de dois meses
141	**A árvore que consome mais de 190 litros de água por dia é a Faia**	**4.38 (50%)**	**4.71 (50%)**	**A árvore que consome 10 litros de água por dia é a Faia**
142	**A altura média da mulher americana é de 1,65 cm**	**3.88 (50%)**	**4.86 (61%)**	**A altura média da mulher americana é de 1,69 cm**
143	De um Cedro médio pode-se fazer 500 000 lápis	4.75 (63%)	5.25 (88%)	De um Cedro médio pode-se fazer 300 000 lápis
144	A maior presa (dente) de elefante registada até hoje tinha 14,23m	3.75 (50%)	3.13 (38%)	A maior presa (dente) de elefante registada até hoje tinha 11,32m.
145	**O pombo tem um tempo de vida superior ao de um coelho**	**4.25 (42%)**	**4.29 (50%)**	**O coelho tem um tempo de vida superior ao de um pombo**
146	**As beringelas, de forma ovóide, têm cor roxa ou branca**	**4.50 (50%)**	**5.86 (58%)**	**As beringelas, de forma ovóide, têm cor roxa ou castanha**
147	É bem mais fácil ensinar um papagaio macho a falar do que uma fêmea	4.13 (38%)	3.71 (13%)	É bem mais fácil ensinar uma papagaio fêmea a falar do que um macho
148	O bombardeamento mais mortífero de Paris envolveu o dobro de mortes das causadas pelo bombardeamento mais mortífero de Londres	4.13 (38%)	4.63 (50%)	O bombardeamento mais mortífero de Londres envolveu o dobro de mortes das causadas pelo bombardeamento mais mortífero de Paris
149	**Os ratos domésticos atingem velocidades aproximadamente de 15 km/hora**	**4.50 (50%)**	**4.50 (60%)**	**Os ratos domésticos atingem velocidades aproximadamente de 10 km/hora**
150.	Um bébé em 5 mil, nasce com lábio leporino	3.25 (13%)	4.00 (38%)	Um bébé em mil, nasce com lábio leporino
151	**Uma cria de urso ao nascer pesa apenas cerca de 5,5kg**	**4.13 (50%)**	**4.25 (50%)**	**Uma cria de urso ao nascer pesa apenas cerca de 3,5kg**
152	As bananeiras não são árvores mas sim uma espécie de	3.88 (38%)	2.88 (25%)	As bananeiras não são árvores mas sim plantas de grandes

	cana			dimensões
153.	Os peixes não conseguem permanecer de olhos fechados, pelo que não dormem do mesmo modo que os mamíferos	4.38 (50%)	4.00 (25%)	Os peixes não conseguem permanecer de olhos fechados, mas, do mesmo modo que os mamíferos, dormem
154.	Dois pregos colocados, um acima do outro, num tronco de uma arvore, permanecerão exactamente à mesma distancia à medida que a arvore cresce	4.25 (38%)	3.63 (38%)	Dois pregos colocados, um acima do outro, num tronco de uma arvore, aumentaram a distancia um do outro à medida que a arvore cresce
155	Os cornos da Camurça apresentam nas extremidades uma curvatura em gancho dirigida para traz	5.25 (56%)	4.63 (50%)	Os cornos da Camurça apresentam nas extremidades uma curvatura em gancho dirigida para a frente
156.	Em vinte doentes de gota, 19 são do sexo masculino	4.88 (75%)	5.38 (88%)	Em vinte doentes de gota, 11 são do sexo masculino
157.	Luís XVI casou por procuração com Maria Luísa, filha do Imperador da Áustria	4.00 (40%)	4.88 (50%)	Napoleão casou por procuração com Maria Luísa, filha do Imperador da Áustria
158	O suco da cana do açúcar que serve de base ao açúcar é igualmente a base do fabrico do rum	5.25 (75%)	4.63 (50%)	O suco da cana do açúcar que serve de base ao açúcar é igualmente a base do fabrico do gim
159	Carlos Magno foi coroado Imperador do Ocidente, pelo Papa, no dia de Natal	4.25 (50%)	4.25 (42%)	Carlos Magno foi coroado Imperador do Ocidente, pelo Papa, no dia de Páscoa
160	Os chapéus "panamá" são uma industria do México	3.00 (30%)	4.63 (50%)	Os chapéus "panamá" são uma industria do Equador
161	Lord Byron após se ter separado da sua mulher, saiu de Inglaterra por uns tempos	4.50 (50%)	4.88 (50%)	Lord Byron após se ter separado da sua mulher, saiu de Inglaterra e nunca mais lá voltou
162	Para congelar álcool puro é necessária uma temperatura abaixo de 40 graus negativos	4.38 (50%)	4.25 (50%)	Para congelar álcool puro é necessária uma temperatura abaixo de 90 graus negativos
163	A África tem uma área quatro vezes superior à da Europa	2.88 (38%)	3.50 (25%)	A África tem uma área três vezes superior à da Europa
164	Os chitas são cerca de 8 milhões e vivem quase todos no Irão	3.75 (25%)	3.50 (13%)	Os chitas são mais de 16 milhões e vivem quase todos no Irão
165	A zona mais profunda do pacífico tem cerca de 11 mil metros de profundidade	4.13 (38%)	5.00 (75%)	A zona mais profunda do pacífico tem cerca de 9 mil metros de profundidade
166	O coelho pode ter de 3-12 crias num intervalo de 5-6 semanas	4.00 (50%)	4.50 (42%)	O coelho pode ter de 3-12 crias num intervalo de 2-3 meses
167	Se nos colocarmos meio metro acima do nível das águas do mar, podemos ver uma distancia de cerca de 6 km	3.88 (38%)	5.13 (75%)	Se nos colocarmos meio metro acima do nível das águas do mar, podemos ver uma distancia de cerca de 10 km
168.	O primeiro sistema de distribuição de águas pelas cidades, parece ter sido construído pelos fenícios	4.88 (75%)	5.88 (100%)	O primeiro sistema de distribuição de águas pelas cidades, parece ter sido construído pelos Maias
169.	Os escorpiões não são imunes ao seu próprio veneno, pelo que se podem suicidar	2.63 (25%)	6.00 (88%)	Os escorpiões são imunes ao seu próprio veneno, pelo que não se podem suicidar
170.	A temperatura do lado oculto da lua atinge valores de cerca de 50 graus negativos	5.25 (75%)	4.13 (38%)	A temperatura do lado oculto da lua atinge valores abaixo de 150 graus negativos
171.	A principal condecoração de França é a da Legião de Honra	4.50 (38%)	4.75 (63%)	A principal condecoração de França é a da Cruz de Ferro
172.	Quando a Imperatriz Elizabeth da Rússia, morreu possuía 150 mil vestidos nos seus armários	3.63 (25%)	4.63 (50%)	Quando a Imperatriz Elizabeth da Áustria, morreu possuía 150 mil vestidos nos seus armários
173.	Cada extracção de cortiça tem de respeitar um período mínimo de 9 anos	5.00 (75%)	5.25 (50%)	Cada extracção de cortiça tem de respeitar um período mínimo de 2 anos
174.	É possível obter diamantes cristalizando o hidrogénio puro, por o submeter a temperaturas muito elevadas e a fortes pressões	5.38 (63%)	4.38 (48%)	É possível obter diamantes cristalizando o carbono puro, por o submeter a temperaturas muito elevadas e a fortes pressões
175.	As cascavéis mudam de pele 3-4 vezes num ano	3.50 (25%)	4.75 (63%)	As cascavéis mudam de pele 5-6 vezes num ano
176.	A maior estrela classificada tem um diâmetro 2000 vezes superior ao da terra	4.25 (50%)	4.63 (38%)	A maior estrela classificada tem um diâmetro 2000 vezes superior ao do sol
177.	A velocidade máxima que um pombo pode atingir em pleno ar, é inferior a 100 km/hora	3.63 (38%)	4.63 (50%)	A velocidade máxima que um pombo pode atingir em pleno ar, é superior a 100 km/hora
178.	Quimicamente o açúcar de milho não é a mesma substancia que o açúcar de beterraba ou de cana	4.38 (50%)	4.13 (50%)	Quimicamente o açúcar de milho é a mesma substancia que o açúcar de beterraba ou de cana
179.	D.Pedro e D.Inês de Castro tiveram três filhos	3.25 (48%)	4.13 (60%)	D.Pedro e D.Inês de Castro tiveram um filho
180.	O esófago tem 20 cm de comprimento e 2cm diâmetro	5.25 (88%)	4.00 (50%)	O esófago tem 30 cm de comprimento e 3cm de diâmetro
181.	Os poços petrolíferos de Israel produzem anualmente mais de 220 mil toneladas de petróleo	4.50 (38%)	5.13 (88%)	Os poços petrolíferos de Israel produzem anualmente mais de 420 mil toneladas de petróleo
182.	Um ex-escravo, George Carver, enriqueceu por ter desenvolvido mais de 300 produtos à base de amendoim	3.75 (13%)	4.75 (50%)	Um ex-escravo, George Carver, enriqueceu por ter desenvolvido mais de 300 produtos à base de maça
183.	O pescoço das aves têm cerca do dobro das vértebras do pescoço de uma girafa	2.63 (0%)	3.75 (50%)	O pescoço das girafas têm cerca do dobro das vértebras do pescoço de uma ave
184.	Em Portugal o voto feminino tornou-se efectivo a apartir de 1901	4.38 (75%)	3.25 (25%)	Em Portugal o voto feminino tornou-se efectivo a apartir de 1931
185.	A esfinge de Gizé esculpida em plena rocha tem 70 m de altura	5.25 (88%)	4.38 (50%)	A esfinge de Gizé esculpida em plena rocha tem 22 m de altura
186.	O Infante D.Fernando foi o sexto e ultimo filho de D.João I e D.Filipa de Lencastre	4.63 (63%)	3.88 (25%)	O Infante D.Fernando foi o oitavo e ultimo filho de D.João I e D.Filipa de Lencastre
187.	Os pontos mais altos e mais baixos dos EUA situam-se no mesmo estado - Alasca	3.75 (38%)	3.75 (25%)	Os pontos mais altos e mais baixos dos EUA situam-se no mesmo estado- Califórnia
188.	O mar onde se verificam ondas de maior envergadura (cerca de	5.50 (75%)	3.75 (50%)	O mar onde se verificam ondas de maior envergadura (cerca de

	21m) é o Pacífico			21 m) é o Atlântico
189.	A espécie mais pequena de peixe tem apenas 10mm de comprimento nunca ultrapassando os 11mm	3.63 (25%)	3.75 (50%)	A espécie mais pequena de peixe tem apenas 1mm de comprimento nunca ultrapassando os 1.5mm
190.	As quatro diferentes modalidades do hóquei difere no terreno e suas dimensões bem como no número de jogadores	4.63 (50%)	5.38 (88%)	As quatro diferentes modalidades do hóquei difere no terreno, suas dimensões mas não no número de jogadores
191.	Portugal figura entre os cinco primeiros produtores de azeite do mundo	5.38 (100%)	5.25 (100%)	Portugal figura entre os sete primeiros produtores de azeite do mundo
192.	O maior lago do mundo situa-se na América do Norte	4.38 (50%)	4.38 (50%)	O maior lago do mundo situa-se na fronteira da Europa e Asia
193.	O principal rio da Europa é o Danúbio	4.63 (50%)	4.13 (38%)	O principal rio da Europa é o Reno
194.	O coração de uma cobra chega a bater 24 horas após se ter separado a cabeça do seu corpo	4.13 (50%)	3.50 (48%)	O coração de uma galinha chega a bater 24 horas após se ter separado a cabeça do seu corpo
195.	O plasma representa cerca de 55% do volume total do sangue circulante	4.13 (42%)	5.25 (55%)	O plasma representa cerca de 55% do volume total do sangue circulante
196.	O basquetebol foi inventado em Inglaterra em 1891	5.75 (58%)	3.63 (38%)	O basquetebol foi inventado nos EUA em 1801
197.	A dinastia Chinesa Ching é anterior à dinastia Ching	4.29 (48%)	4.25 (40%)	A dinastia Chinesa Chang é anterior à dinastia Chang
198.	Los Angeles tem um numero de habitantes inferior a Nova York	4.88 (63%)	3.13 (13%)	Los Angeles tem um numero de habitantes superior a Nova York
199.	Existe maior produção de coelhos na França do que na Hungria	4.13 (13%)	4.75 (50%)	Existe maior produção de coelhos na Hungria do que na França
200.	A altura máximo é alcançada no sexo masculino aos 25 anos e no feminino aos 18 anos	3.75 (38%)	4.38 (75%)	A altura máximo é alcançada no sexo masculino aos 18 anos e no feminino aos 16 anos

APPENDIX 1: FIRST EXPERIMENT
APPENDIX 1.2: PRE-TEST: AMUSEMENT
APPENDIX 1.2.1: INSTRUCTIONS +
Ex: ANSWER SHEET

EVALUATION OF SENTENCES IMPACT ON AMUSEMENT

The amusement promoted by the reading of a sentence can interfere with mood ratings. If the sentences presented to subjects are in general evaluated as funny it could happen that all them report to be in a happy mood. A ceiling effect could then hide any difference promoted by mood. In order to avoid this possibility 30 judges evaluate sentences perceived degree of amusement, by choosing a number of a scale anchored in (1- very serious; 7- very funny).

INSTRUÇÕES

Pedimos a sua colaboração no pré-teste de um conjunto de frases para um estudo dos efeitos do estado de espírito sobre capacidades mnésicas. Necessitamos de saber o impacto que cada uma destas frases, previamente seleccionados por outros critérios, podem ter no estado de espírito de quem as lê.

Na página que se segue a estas instruções você vai ler um conjunto de 52 frases curtas. Gostaríamos que nos desse a sua opinião relativamente à característica mais ou menos divertida que cada uma das frases pode possuir. As frases referem algumas curiosidades que não pretendem ser humorísticas. Assim a maioria delas poderão, em sua opinião ser consideradas como frases muito sérias, nada divertidas (pontuação de 1). No entanto, algumas até que poderão fazê-lo esboçar um sorriso, por referirem factos curiosos que entretêm quem as leia. Nesse caso, mesmo que não considere que a frase é "muito divertida" (uma pontuação de 7), pelo menos assinale a frase como "algo divertida" (acima de 4).

À frente de cada frase encontra-se um conjunto de números que referem a seguinte escala de sete pontos

1..............2................3...................4................5......................6....................7

Muito séria — nem uma coisa nem outra — Muito divertida

Assinale a sua resposta , fazendo um circulo em torno do número que melhor representa a sua opinião, relativamente a cada uma das frases.

Caso se engane, risque a resposta errada.

Em caso de dúvida levante o braço de forma a chamar o experimentador.

Obrigado pela sua colaboração.

Vire por favor

1..............2................3...................4................5......................6....................7

Muito Séria — nem uma coisa nem outra — Muito divertida

1.	Os crocodilos dormem de olhos abertos	1.	1 2 3 4 5 6 7
2.	A estátua do Cristo-Rei tem 38m de altura	2.	1 2 3 4 5 6 7
3.	Uma mão direita e esquerda juntas eram o símbolo da amizade para os romanos	3.	1 2 3 4 5 6 7
4.	São necessários 20 dias para que uma mosca doméstica seja bisavó	4.	1 2 3 4 5 6 7
5.	Nenhum lugar na terra está livre de tempestades eléctricas	5.	1 2 3 4 5 6 7
6.	(...)	6.	(...)

APPENDIX 1: FIRST EXPERIMENT
APPENDIX 1.2: PRE-TEST: AMUSEMENT
APPENDIX 1.2.2: RESULTS

TABLE: Ratings of amusement associated with each sentence: Means and standard deviations

LIST A1	Mean	Std.Dev	Mean	Std.Dev	LIST A2
1. Os crocodilos dormem de olhos abertos	3.70	1.06	3.00	1.63	1. Os crocodilos dormem de olhos fechados
2. A estátua do Cristo-Rei tem 38m de altura	2.90	.88	1.75	.50	2. A estátua do Cristo-Rei tem 28m de altura
3. Uma mão direita e esquerda juntas eram o símbolo da amizade para os romanos	2.70	1.03	2.00	.82	3. Duas mãos direitas juntas eram o símbolo da amizade para os romanos
4. São necessários 20 dias para que uma mosca doméstica seja bisavó	5.00	1.41	4.50	1.73	4. São necessários 60 dias para que uma mosca doméstica seja bisavó
5. Nenhum lugar na terra está livre de tempestades eléctricas	2.20	1.03	2.25	1.89	5. Nenhum lugar na terra está livre de actividade vulcânica
6. O Egipto tem apresentado nos últimos anos. as taxas mundiais mais baixas de suicídio	2.20	.79	3.50	1.91	6. A Etiópia tem apresentado nos últimos anos as taxas mundiais mais baixas de suicídio
7. A máxima velocidade atingida por um réptil em terra é de 46km/hora	3.50	.85	4.25	1.71	7. A máxima velocidade atingida por um réptil em terra é de 66km/hora
8. Uma ervilha não mastigada deixa vestígios nas fezes	4.20	.92	5.25	1.26	8. Uma ervilha não mastigada encontrar-se-á inteira nas fezes
9. O preço mais elevado alguma vez pago por uma orquídea foi de 50 contos. em 1906	4.30	1.06	4.75	1.71	9. O preço mais elevado. alguma vez pago por uma orquídea foi de 500 contos. em 1906.
10. A fritura em óleo consiste na criação de uma película de glúcidos coagulados e colorados	2.80	1.14	1.50	.58	10. A fritura em óleo consiste na criação de uma película de proteínas coaguladas e caramelização dos glúcidos
11. A flor mais pequena do mundo encontra-se no Brasil e mede 1milímetro	3.20	1.23	2.25	.50	11. A flor mais pequena do mundo encontra-se no Japão e mede meio milímetro
12. O primeiro piano foi construído em Itália em 1709	2.78	1.20	1.50	.58	12. O primeiro piano foi construído em 1709. na Austria
13. A graduação do vinho da Madeira situa-se entre os 20 e 22 graus	2.80	1.03	2.00	.82	13. A graduação do vinho da Madeira situa-se entre os 18 e 20 graus
14. O gelado de cone surgiu nos EUA em 1924.	3.20	1.03	3.00	1.63	14. O gelado de cone surgiu em 1904. nos EUA
15. O primeiro filme de desenhos animados é inglês	3.30	.95	1.75	.50	15. O primeiro filme de desenhos animados é francês
16. O presidente dos EUA. John Taylor adoptou 14 crianças	3.80	1.32	3.75	2.36	16. O presidente dos EUA. John Taylor. foi pai de 14 crianças
17. Uma joaninha recém nascida é amarela e vermelha	3.60	1.26	2.25	.50	17. Uma joaninha recém nascida é cinzenta e amarela
18. A infecção com maior prevalência no mundo é a malária	1.60	.52	1.25	.50	18. A infecção com maior prevalência no mundo é a cólera
19. A maior distância a que uma bola de basebol foi lançada é de cerca de 130 metros	3.10	1.10	1.75	.96	19. A maior distância a que uma bola de basebol foi lançada é de cerca de 230 metros
20. O primeiro cão-guia para cegos. foi apresentado a um cego em 1948	3.20	1.14	1.75	.96	20. O primeiro cão-guia para cegos foi apresentado a um cego em 1938
21. A primeira bandeira da Confederação nos EUA designava-se "Antiga Glória"	2.80	1.23	3.25	1.50	21. A primeira bandeira da Confederação nos EUA designava-se "Estrelas e Linhas"
22. Os selos de via aérea foram emitidos pela primeira vez a 13 de Maio de 1918	2.70	1.06	1.50	.58	22. Os selos de via aérea foram pela primeira vez emitidos em 13 de Maio de 1926
23. O nº de rotações de uma máquina de lavar roupa pode ir de 500 a 1100 por minuto	3.10	.99	2.25	.96	23. 23 O nº de rotações de uma máquina de lavar roupa pode ir de 100 a 500 por minuto
24. As unhas dos dedos das mãos crescem mais rapidamente do que as dos pés	3.40	1.26	2.50	1.00	24. 24 As unhas dos dedos dos pés crescem mais rapidamente do que as das mãos
25. As balizas do pólo aquático têm 2 metros de largura	3.20	1.03	1.50	.58	25. 25 As balizas do pólo aquático têm 3 metros de largura
26. O sangue do corpo humano completa um circuito de 23 em 23 segundos	2.50	.85	1.75	.96	26. 26 O sangue do corpo humano completa um circuito de 23 em 23 minutos

LIST B1					LIST B2
27. O organismo humano sintetiza metade da quantidade da vitamina K necessária	2.20	.79	1.50	.58	27. O organismo humano sintetiza quase a totalidade da vitamina K necessária
28. O primeiro semáforo foi colocado nos EUA e era apenas vermelho e verde	3.70	1.25	3.25	2.63	28. O primeiro semáforo foi colocado nos EUA e era vermelho, branco e verde
29. Uma dona de casa lava na sua vida em média, 2.5 milhões de artigos de vestir.	4.00	1.63	5.25	1.26	29. Uma dona de casa lava na sua vida, em média 2.5 milhões de artigos de cozinha.
30. É da ordem das centenas de milhares o número de espermatozóides expelidos durante o orgasmo masculino	3.40	1.35	2.50	1.29	30. É da ordem das centenas de milhões o número de espermatozóides expelidos durante o orgasmo masculino
31. O pombo tem um tempo de vida superior ao de um coelho	3.30	1.16	3.00	1.83	31. O coelho tem um tempo de vida superior ao de um pombo
32. As beringelas, de forma ovóide, têm cor roxa ou branca	3.30	1.34	3.00	.82	32. As beringelas, de forma ovóide, têm cor roxa ou castanha
33. Napoleão casou por procuração com Maria Luísa, filha do Imperador da Austria	3.60	1.17	2.00	0.00	33. Luís XVI casou por procuração com Maria Luísa, filha do Imperador da Austria
34. Carlos Magno foi coroado, pelo Papa e no dia de Páscoa, Imperador do Ocidente.	3.00	1.05	1.75	.50	34. Carlos Magno foi coroado Imperador do Ocidente, pelo Papa, no dia de Natal
35. O maior lago do mundo situa-se na América do Norte	2.90	.99	1.75	.50	35. O maior lago do mundo situa-se na fronteira da Europa com a Asia
36. O coração de uma cobra chega a bater 24 horas após se ter separado a cabeça do seu corpo	3.50	1.51	4.00	1.63	36. O coração de uma galinha chega a bater 24 horas após se ter separado a cabeça do seu corpo
37. O basquetebol foi inventado nos EUA em 1891	3.10	1.10	1.75	.50	37. O basquetebol foi inventado em Inglaterra em 1891
38. A dinastia Chinesa Ching é anterior à dinastia Chang	3.30	1.34	3.50	1.00	38. A dinastia Chinesa Chang é anterior à dinastia Ching
39. D.Pedro e D.Inês de Castro tiveram três filhos	2.60	.97	2.75	2.22	39. D.Pedro e D.Inês de Castro tiveram um filho
40. O plasma representa cerca de 45% do volume total do sangue circulante	2.00	.94	1.25	.50	40. O plasma representa cerca de 55% do volume total do sangue circulante
41. A expressão "peste negra" tem a sua origem no aspecto físico do doente, visto que a pele seca e escurece assinalando a morte.	2.00	1.05	1.75	96	41. A expressão "peste negra" tem a sua origem na utilização da palavra "negra" como significado de "terrível"
42. As traças têm cerca de 1 centímetro de comprimento	3.20	1.23	4.00	82	42 As traças têm cerca de 6 milímetros de comprimento
43. A baleia azul, pesando cerca de 100 toneladas necessita de 40 kg de alimento diário	3.70	1.25	4.25	2.50	43. A baleia azul, pesando cerca de 100 t necessita apenas de 4 t de alimento diário
44. A cólera apenas desapareceu da Europa no século XIX	2.00	67	1.25	50	44. A cólera apenas desapareceu da Europa no século XX
45. A Faia é uma árvore que consome cerca de 10 litros de àgua por dia	3.00	1.15	3.75	2.22	45. A Faia é a árvore que consome mais de 190 litros de àgua por dia.
46. Os ratos domésticos atingem velocidades aproximadamente de 15 km/hora	4.80	1.03	4.00	1.83	46. Os ratos domésticos atingem velocidades aproximadamente de 10 km/hora
47. Uma cria de urso ao nascer pesa apenas cerca de 5.5kg	3.50	97	2.50	1.00	47. Uma cria de urso ao nascer pesa apenas cerca de 3.5kg
48. Lord Byron após se ter separado da sua mulher, saiu de Inglaterra e nunca mais lá voltou	3.20	1.23	3.25	1.26	48. Lord Byron após se ter separado da sua mulher, saiu de Inglaterra por uns tempos
49. Para congelar álcool puro é necessária uma temperatura de cerca de 90 graus negativos	2.80	1.14	1.75	.50	49. Para congelar álcool puro é necessária uma temperatura de cerca de 40 graus negativos
50. O coelho pode ter de 3-12 crias num intervalo de 2-3 meses	4.00	1.15	3.25	2.63	50. O coelho pode ter de 3-12 crias num intervalo de 5-6 semanas
51. A altura média da mulher americana é de 1.69 cm	3.20	1.03	3.00	1.15	51. A altura média da mulher americana é de 1.65 cm
52. Os cornos da Camurça apresentam nas extremidades uma curvatura em gancho dirigida para traz	3.90	1.20	2.50	1.00	52. Os cornos da Camurça apresentam nas extremidades uma curvatura em gancho dirigida para a frente

An analysis of the mean of amusement ratings associated with the last set of 10 items of each version of material used in the first experiment, revealed no difference (F<1) between them. Sentences in general tend to be seen as more serious than funny.

Version of material	Mean of amusement of the 10 last items (F<1)
VERSION 1	2.88
VERSION 2	2.80
VERSION 3	3.05
VERSION 4	3.06
VERSION 5	2.75
VERSION 6	2.55
VERSION 7	2.30
VERSION 8	2.52

MOOD ASSESSMENT IN A PORTUGUESE POPULATION

There is not a tradition of mood research in Portugal. Thus there are no available mood assessment techniques developed for the Portuguese population. In order to be able to assess the current mood of the participants of the first study, an adequate measurement tool had to created and pre-tested.

First pre-test: Thirty university students were presented either with a sad newspaper story or with a happy newspaper story[1]. After reading the story they were asked to rate how they felt at that precise moment on 3 different seven point scales anchored in Happy-Sad (contente-triste), Satisfied-Unsatisfied (satisfeito-insatisfeito), Bad-God (bem-mal) . The results revealed that not only there wasn`t a significant effect of story on subjects mood (F>1) but also that contrary to what was expected, the 3 items were weakly related. Their average item correlation was .45 and Cronbach alpha of .69. Post -experimental interviews carried out with some participants revealed that there are some problems with the direct translation of those adjectives to the Portuguese language. They were not interpret in relation with the mood construct. The meaning associated by the participants with each rating scale was: Am I happy to participate in this experiment? Do I feel that satisfied with it? Am I feeling sick, strange or it's everything OK with me?. Thus these 3 scales seemed not to be assessing the relevant variable.

Second pre-test: In a similar setting to the used on the first-pre-test mood was assessed by using a direct translation of the word mood to Portuguese ("humor"). Participants were asked about their current mood ("humor") (bad or good?). In addition they were asked to list two situations where their mood would be bad and two situations where it would be good. Data collection was interrupted after 10 students had reported, essentially, that their "humor" was a stable characteristic although they" laugh more in parties and comics" then if they were " worried with something". Subjects seem to be interpreted the Portuguese word "humor" with the same meaning as the word *humor* in English.

Third pre-test: In order to understand how the construct of "mood" is defined in the Portuguese population 10 individuals with knowledge of the English construct were interview. They were asked two questions: 1)" How do you say in Portuguese that you are in a bad, negative, mood?" and 2) "How do you say in Portuguese that you are in good, positive, mood?". A total of 29 different small sentences was assembled. Each one is a short statement which describes either a positive or a negative feeling not associated with any emotion in particular but with a diffuse unstable more positive or more negative state. These 29 items were then incorporated into a Likert-type scale. A rating scale of 11 points anchored in 1-It describes very badly and 11-It describes very well, allow subjects to signal how well each statement describes the way they are currently feeling. This initial pool of items was first pilot tested with 30 individuals. The aim was to eliminate ambiguous and non-discriminative items and select a set of 3 or 4 items that could be used to assess mood in a experimental setting.

---

[1] Translations of the stories used in the studies developed with an American population

First pilot study results:

Total Mean=178.89 Std.Dv.=66,03 Valid N:30
Cronbach alpha: 0.967; Standardized alpha: 0.967
Average inter-item correlation.: 0.523

	Mean of item	StDv	Mean of scale if deleted	StDv of scale if deleted	Item-Total Correl	Alpha if deleted
1-A minha disposição está um pouco abalada*	6.68	2.88	172.21	62.72	.738	.966
2-Posso dizer que "estou numa boa"	4.64	2.88	174.25	62.56	.797	.965
3- Sinto-me, muito bem	4.86	2.97	174.04	62.47	.795	.965
4-Neste momento sinto-me mais para o triste*	8.00	2.72	170.89	63.16	.613	.966
5-Não estou lá muito bem disposto.*	**6.93**	**3.15**	**171.96**	**62.25**	**. 829**	**.965**
6-Nos meus lábios esboça-se um sorriso	6.29	3.07	172.61	62.89	.632	.966
7-Este não é um dos meus momentos/dias*	6.46	3.47	172.43	62.31	.729	.966
8-Estou muito contente	4.71	3.26	174.18	62.14	.793	.965
9-Os meus olhos têm o esboço de um sorriso.	5.18	3.37	173.71	62.17	.798	.965
10- Sinto-me mais para o Positivo	5.93	3.14	172.96	62.73	.671	.966
11-Não existe a mínima tensão sobre o meu rosto	5.04	2.94	173.86	63.65	.394	.968
12-As minha energias estão um pouco frouxas.*	5.96	3.45	172.93	62.82	.579	.967
13-Sinto-me algo deprimido*	6.93	3.40	171.96	62.31	.746	.965
14-Estou divertido	5.71	2.81	173.18	63.28	.548	.967
15-Posso dizer que estou um pouco em baixo*	6.54	3.40	**172.36**	**62.02**	**.834**	**.965**
16-Se tentar sorrir, sinto que só o faço com os lábios*	7.36	3.26	171.54	62.55	.701	.966
17-Estou com a disposição que gostava de ter sempre	4.25	3.26	174.64	62.39	.754	.965
18-Há em mim uma certa melancolia*	7.11	2.96	171.79	63.01	.615	.966
19-Sinto-me com todas as minhas energias activas	3.71	2.32	175.18	63.38	.630	.966
20-Estou num daquele momentos que quero que passe*	6.00	3.87	172.89	62.38	.628	.967
21-Sinto-me a franzir um pouco as sobrancelhas*	7.04	3.35	171.86	62.30	.759	.965
22-Gostava de me sentir bem melhor do que me sinto*	**5.82**	**3.67**	**173.07**	**61.91**	**.801**	**.965**
23-O meu estado de espirito é positivo	**5.96**	**3.14**	**172.93**	**62.37**	**.808**	**.965**
24-Estou num daqueles momentos para esquecer*	7.14	3.55	171.75	62.33	.707	.966
25-Estou num "momento-Não"*	7.79	3.30	171.11	62.50	.708	.966
26-Neste momento, "estou na maior"	4.79	2.85	174.11	62.58	.799	.965
27-Neste momento, "corre tudo bem"	5.32	2.82	173.57	63.06	.629	.966
28-Levantei-me com o pé esquerdo*	9.36	1.95	169.54	63.82	.520	.967
29-Este é um momento "Não me digas nada"*	7.39	3.67	171.50	62.38	.668	.966

Note: Negative items (signaled *) were inverted for this analysis. In **bold** items selected for a small version of the scale.

The four items selected presented high item-total correlations and good discrimination rates. Their total score correlates .96 with the total of the complete version. A second pilot of this set of four items was then developed.

Second pilot study results:

Mean=23,56 Std.Dv.=9,50 Valid N:50
Cronbach alpha: .844 Standardized alpha: .844
Average inter-item corr.: .581

	Mean of item	StDv	Mean of scale if deleted	StDv of scale if deleted	Item-Total Correl	Alpha if deleted
5-Não estou lá muito bem disposto.	6.58	2.88	16.98	7.33	.635	.820
15-Posso dizer que estou um pouco em baixo	6.10	3.02	17.46	6.86	.790	.750
22-Gostava de me sentir bem melhor do que me sinto	4.28	3.10	19.28	6.98	.490	.842
23-O meu estado de espirito é positivo	6.60	2.47	16.96	7.72	.603	.834

INSTRUÇÕES

Na investigação em Psicologia é frequentemente necessário conceber situações mais ou menos artificiais que nos permitam garantir a presença de uma ou outra concretização das variáveis em estudo. Para tal a própria definição da situação bem como o material que a compõe necessita de ser cuidadosamente testado antes de ser incorporado num estudo. A este conjunto de estudos preliminares que nos garantem a validade das manipulações realizadas, designamos de pre-testes.

Pedimos-lhe a sua colaboração para a realização de 3 pequenos pre-testes, com as durações respectivas de 5 minutos, 10-15 minutos e 2-5 minutos.

A primeira tarefa que lhe é pedida, consiste em ouvir um conjunto de 30 frases curtas. Cada uma das frases que lhe será apresentada refere o que podemos designar de "uma curiosidade" relativa a um conjunto de temas diversos. Gostaríamos de saber se, em sua opinião, se trata de uma frase cujo conteúdo é muito interessante, apenas interessante, pouco interessante ou mesmo nada interessante. Para o efeito pedimos-lhe que assinale a sua resposta numa escala de 7 pontos que vai desde *Nada interessante* a *Muitíssimo interessante*.
Para ser mais fácil compreender, atendamos ao seguinte exemplo.
Você irá ouvir uma frase do tipo "A maior cidade a sul do equador é Buenos Aires na Argentina" ou então "Um cubo de gelo não aumenta o nível da àgua de um copo à medida que derrete"

Na folha que se segue a estas instruções, você encontrará um conjunto de escalas onde deverá assinalar com um circulo o número que melhor representa a sua opinião relativamente ao grau de interesse que lhe suscita este tipo de curiosidade. Assim, se considerar que, saber qual é a maior cidade a sul do equador é muitíssimo interessante deverá fazer um circulo em torno do número 7. Caso considere que lhe interessa apenas moderadamente o conhecimento relativo ao gelo, deverá assinalar o meio da escala, isto é o número 4. Quanto mais desinteressante achar o tema menor o número quer deverá atribuir à frase, e inversamente, quanto mais interessante maior deverá ser o número assinalado.

1-------2--------3--------4-------5---------6--------7
Nada interessante Muitíssimo interessante

As frases vão-lhe ser apresentadas oralmente, por uma gravação. Cada frase será lida com o ritmo de uma frase por cada 10 segundos, pelo que o seu julgamento terá de ser relativamente rápido, não havendo muito tempo para pensar na melhor resposta. Assim:
- Oiça cada frase e logo que possível assinale um número. Caso a frase seguinte surja antes de você conseguir assinalar a sua resposta, marque rapidamente o número 4 de forma a conseguir realizar a tarefa para a frase que está naquele momento a ser proferida. Não interrompa sob qualquer pretexto a audição da gravação.
- De inicio, haverá uma certa dificuldade em adequar o seu ritmo de resposta ao ritmo com que as frases são proferidas, no entanto tal adequação é usualmente alcançada na 3º ou 4º frase. Assim as primeiras 4 frases da gravação são consideradas de Ensaio.
- O ritmo de apresentação das frases não será interrompido surgindo as frases do verdadeiro pre-teste em sequência as do ensaio. Pelo que é melhor pensar que existe apenas uma lista que será lida toda ao mesmo ritmo. Fique, no entanto descansado com algum descontrolo que poderá sentir nas primeiras frases. E já sabe, se tiver algum problema com alguma das outras frases marque o número 4 e centre de imediato toda a sua atenção na frase que está a ser proferida naquele momento.

As duas tarefas que se seguem serão apresentadas na devida altura. Por agora vire esta folha e prepare-se para ouvir atentamente a gravação de 30 frases.

INSTRUÇÕES: 2ª e 3ª tarefas

Uma das manipulações que pretendemos fazer no estudo que tem por suporte este pre-teste diz respeito à veracidade ou falsidade das frases que apresentamos aos sujeitos.

Acontece que a totalidade de conhecimentos que temos relativamente à realidade em que vivemos atinge proporções tais, que nunca a conseguiríamos inventariar. Mesmo quando, aparentemente desconheçamos pormenores dessa realidade, o conjunto de conhecimentos que possuímos permitem-nos acreditar ou duvidar de afirmações feitas sobre esta.

Assim, se nos disserem que o primeiro ministro da defesa chinês se chamava João Vasques, tendemos a considerar esta afirmação como falsa, mesmo desconhecendo na totalidade o nome que ocupou tal cargo. Se nos disserem que a primeira língua europeia com que os povos do sul de África contactaram foi o português tendemos a atribuir-lhe elevada credibilidade.

Necessitamos de saber como são percebidas as frases que seleccionamos para o nosso estudo relativamente à sua veracidade ou falsidade. Assim apresentar-lhe-emos de seguida por escrito, neste caderno de folhas, um conjunto de **afirmações metade verdadeiras e metade falsas**. Leia cada frase com atenção e diga-nos com que confiança considera que essa afirmação é verdadeira ou falsa. Faça um circulo em torno do número que melhor representa a sua resposta, tendo em conta a seguinte escala:

1..............2................3......................4. ....5......................6....................7
Decerteza Falso Prov. Falso Poss. Falso Incerto Poss. Verd. Prov. Verd. De certeza Verd.

É importante que realize esta tarefa pela ordem com que as frases lhe são apresentadas e a um ritmo mais ou menos idêntico ao utilizado na tarefa anterior. Isto é, não pare para pensar muito sobre o assunto, dê-nos a sua opinião espontanea.

A ultima folha deste caderno diz respeito à terceira tarefa.
Por favor, não a veja antes de ter terminado a avaliação das frases.
Nessa folha você lerá 5 frases que poderão descrever melhor ou pior cada um de nós num dado momento da nossa vida. Você deverá assinalar um número numa escala idêntica ás que tem vindo a utilizar, indicando quão bem cada uma dessas frases o descreve a si, naquele preciso momento.

Obrigado, pela sua colaboração.

AVALIAÇÃO DO GRAU DE INTERESSE DO TEMA:

1............2............3..............4............5.................6...............7

Nada Interessante — Muitissimo interessante

Ensaio:

1) 1-------2--------3--------4-------5---------6--------7
2). 1-------2--------3--------4-------5---------6--------7
3) 1-------2--------3--------4-------5---------6--------7
4) 1-------2--------3--------4-------5---------6--------7

Teste

1- 1-------2--------3--------4-------5---------6--------7
2- 1-------2--------3--------4-------5---------6--------7
3- 1-------2--------3--------4-------5---------6--------7
4- 1-------2--------3--------4-------5---------6--------7
5- 1-------2--------3--------4-------5---------6--------7
6- (...)

1...............2.................3.....................4.................5......................6...................7

De certeza Falso	Provavelmente Falso	Possivelmente Falso	Incerto	Possivelmente Verdadeiro	Provavelmente Verdadeiro	De certeza Verdadeiro

1. O ovo de uma avestruz leva cerca de uma hora a cozer — 1. 1 2 3 4 5 6 7
2. O ser humano tem cerca de 630 ossos — 2. 1 2 3 4 5 6 7
3. Duas mãos direitas juntas eram o símbolo da amizade para os romanos — 3. 1 2 3 4 5 6 7
4. Uma joaninha recém nascida é cinzenta e amarela — 4. 1 2 3 4 5 6 7
5. A dinastia Chinesa Chang é anterior à dinastia Ching — 5. 1 2 3 4 5 6 7
6. (....) — 6. (...)

Pense no seu estado de espírito, na sua disposição, deste preciso momento e assinale quão bem cada uma das seguintes frases o descrevem.
(assinale com um circulo o número que melhor representa a sua resposta)

NESTE PRECISO MOMENTO ESTA FRASE...

	Não me descreve nada — Descreve-me Totalmente
O meu estado de espirito é positivo............................	1----2----3----4----5----6----7----8----9----10----11
Não estou lá muito bem disposto......................	1----2----3----4----5----6----7----8----9----10----11
Posso dizer que estou um pouco em baixo...................	1----2----3----4----5----6----7----8----9----10----11
Gostava de me sentir bem melhor do que me sinto.....	1----2----3----4----5----6----7----8----9----10----11

APPENDIX 1: FIRST EXPERIMENT
APPENDIX 1.5: TEST: REPORTED DATA
APPENDIX 1.5.1: Truth ratings

Anova assumptions: Mixed design with a two levels within factor
Design: 2 (familiar or unfamiliar final block) x 8 (stimulus set) x 2(repeated and novel sentences)
Dependent variable: Truth ratings of first items

	Tests of Homogeneity of Variances					Fit to Normal Distribution				
	Hartley F-max	Cochran C	Bartlett Chi-sqr	df	p	Kolmogorov-Smirnov d	p	Chi-Square	df	p
NEW	5.316	.112	12.113	15	.670	.028	n.s	10.01	8	.264
OLD	3.832	.113	9.550	15	.847	.068	n.s	34.523	5	.000

Test of Compound symmetry

Box M	Chi-Sqr.	df	p-level
51.396	47.108	45	.386

Anova: Summary of all Effects. Mixed analysis of variance .
Design: 2 (familiar or unfamiliar final block) x 8 (stimulus set) x 2(repeated and novel sentences)
Dependent variable: Truth ratings of first items

	df	MS	F	p-level
Familiarity	1	.004	.006	.937
Stimulus set	7	.255	.408	.896
Repeated vs novel	1	129.256	267.757	.000
Familiarity x Stimulus set	7	.640	1.038	.407
Familiarity x Rep. vs novel	1	1.549	3.210	.075
Stimulus set x Rep. vs novel	7	1.044	2.162	.040
Fam.x St. set x Rep. vs novel	7	1.118	2.317	.028
Error for within comparisons	154	.482		
Error for between comparisons	154	.617		

Anova assumptions: Between design
Design: 2 (familiar or unfamiliar final block) x 8 (stimulus set)
Dependent variable: Truth ratings of 10 last items

Tests of Homogeneity of Variances					Fit to Normal Distribution					Correlation of means and variances	
Hartley F-max	Cochran C	Bartlett Chi-sqr	df	p	Kolmogorov-Smirnov d	p	Chi-Square	df	p	r	p
25.203	.183	51.460	15	.0000	.142	.01	66.074	6	.0000	.160	.146

Anova assumptions: Between design
Design: 2 (familiar or unfamiliar final block) x 8 (stimulus set)
Dependent variable: Ratings of mood

Tests of Homogeneity of Variances					**Fit to Normal Distribution**				
Hartley F-max	Cochran C	Chi-Square	df	p	Kolmogorov-Smirnov d	p	Chi-Square	df	p
4.988	.103	12.604	15	.633	.033	n.s.	12.655	7	.0810

Anova: Summary of all Effects (**Outlier extracted**)
Design: 2 (familiar or unfamiliar final block) x 8 (stimulus set)
Dependent variable: Ratings of mood

	df	**MS**	**F**	**p-level**
Familiarity	1	26.446	4.572	.034
Stimulus set	7	5.081	.878	.525
Familiarity x Stimulus set	7	6.811	1.177	.319
Error	144	5.784		

Anova: Summary of all Effects (**Outlier included**)
Design: 2 (familiar or unfamiliar final block) x 8 (stimulus set)
Dependent variable: Ratings of mood

	df	**MS**	**F**	**p-level**
Familiarity	1	24.060	3.894	.050
Stimulus set	7	3.086	.499	.834
Familiarity x Stimulus set	7	9.151	1.481	.178
Error	151	6.177		

Anova: Summary of all Effects.
Design: 2 (familiar or unfamiliar final block) x 8 (stimulus set)
Dependent variable: Truth ratings of 10 last items

	df	MS	F	p-level
Familiarity	1	66.588	99.097	.0000
Stimulus set	7	.385	.573	.776
Familiarity x Stimulus set	7	.956	1.423	.200
Error	155	.672		

Non-Parametric Approach to the factor "familiar or unfamiliar final block"
Dependent variable: Truth ratings of 10 last items

	Kruskal-Wallis test: H (1. N= 171) = 63.296 p =.0000		Median Test. Overall Median = 4.40 Chi-Square = 52.705 df = 1. p = .000			
10 last items	N	Sum of Ranks	=< Median		>Median	
			observ	expect.	observ	expect
Non- Familiar	88	4996.500	69.000	45.287	19.000	42.713
Familiar	83	9709.500	19.000	42.713	64.000	40.287

APPENDIX 2

SECOND EXPERIMENT

2.1.Test
- 2.1.1.Mood manipulation
- 2.1.2.Instructions:
  Computer screens

2.2. Reported data
- 2.2.1. Effectiveness of mood manipulation + Validity decisions

2.3.Non-reported data
- 2.3.1 Validity decisions

Positive Mood

MEETING THEM MORE THAN HALFWAY

CHICAGO - There is absolutely no news in this story. But if you are getting a little tired of reading about warfare, crime, and meanness, you might want to give it a try anyway.

George and Thelma Washburn, of suburban Hinsdale, met a couple Von and Lois Cook, of Mishawaka, Indiana, some years ago. Although they live a fairly long way from each other, the Washburns and the Cooks like to get together a couple of times a year just to say hello.

This summer they decided it might be nice if they had dinner together. So they compromised. They selected a town midway between--the town of Valparaiso, Indiana--and they agreed to meet there for a Sunday dinner.

They asked around, and someone recommended a Valparaiso restaurant called the White House. The food was supposed to be good.

On the appointed day, George and Thelma Washburn drove to the restaurant, a beautiful old house. The Cooks were waiting for them in the parking lot.

"You're not going to believe what happened," Von Cook said as the Washburns got out of their car.

The Cooks had gone into the restaurant, only to be told that it was closed for the day. Usually the White House is open Sundays and closed Mondays. But this particular week, it was closed on Sunday because the owners were having a private family party. The party was due to start in a few hours, and the guests would be arriving.

So the Washburns and the Cooks went into the restaurant. The owners--twin brothers Harry and Paul Pappas--led them to the cocktail lounge and insisted that they have a complimentary drink.

"We feel so bad," Harry Pappas said. "We want you to stay for the party. We want you to be our guests. We insist."

Harry Pappas pulled the Washburns and Cooks aside. "I know you probably don't feel comfortable with a bunch of strangers," he said. "Nobody does. So just mingle if you wish--but I'm going to set you up your own table out on the out on the terrace,where you can visit with each other like you planned in the first place."

The Pappas brothers moved a table out onto the back terrace. There were plants out there, and a big yard and a fish pond. The Pappas brothers said that the buffet was inside, in one of the big rooms. The Washburns and the Cooks were to eat as much as they wanted. There would be no charge.

And so the party started. The Washburns and the Cooks were overwhelmed. They knew no one here, and all of a sudden they were joining people at the lavish buffet table. They helped themselves and went to their private table on the terrace.

As they relived old times together, guests from the party came out to introduce themselves and welcome them. The Pappas brothers came out, too; they told the story of the White House restaurant -- how it had been the family house for years, and how four years ago the brothers had decided to make it into a restaurant.

When the Washburns and the Cooks had finished their meal and their conversation, they walked back into the house. Their party was still in progress.

Mrs. Washburn didn't know what to say. She couldn't believe that they had been taken in just as if they had been invited. So she stood in the middle or the room full of strangers and said, "Thank you all. I just hope you had as nice a time today as we did."

The people in the room started to say good-bye to them, and the Pappas brothers got up to show them the front door.

"Get home safely," Harry Pappas said.

So the Washburns drove toward Hinsdale, and the Cooks drove toward Mishawaka. Mrs. Washburn thought to herself: All you hear about is unfriendliness and nastiness. People are supposed to distrust each other and keep to themselves in a cocoon of self-protection. Once in a while, in a small restaurant off the main highway, you see the other side.

Neutral Mood

A DIFFERENT KIND OF PHYSICIAN

CHICAGO - At most medical schools, students don't see patients until the end of their second year. The first two years are spent learning basic medicine from textbooks and lectures. But in an experimental program, students are being exposed to patients early in their first year, and they begin discussing case histories on their first day.

The program is designed to create more efficient communication between physicians and patients. Because more efficient communication might mean less time spent with each patient, more patients could be seen each day enabling physician incomes to climb dramatically.

Instead of obtaining training through memorization and formal lectures, students in the New Pathway program discover principles of medicine by solving problems. Students attend lectures for only one hour each day; most of their instruction comes from small tutorial groups of six to eight, which are structured around discussions of case studies. Guided by their professors, students discuss the medical history presented in the case and what they need to learn in order to solve it.

During their free afternoons, students can work by themselves on the questions raised in the morning sessions. Each student has a computer to search the medical literature. They can also talk to other students and faculty, or they can test their skills by solving simulated medical problems.

Students spend half a day each week discussing issues affecting patients, and as soon as they enter the program they are paired together with a practicing physician. Together, they see patients in both the office and in the hospital. This continures for the entire four years the student is in medical school.

In addition to the changes in the way students learn, traditional course material has been changed as well. The curriculum is taught in blocks that cover a variety of disciplines. For example, the first curriculum block, "The Body," includes anatomy, radiology and physical examination, three areas usually treated separately. The "Lifecycle" block covers stages of human development from conception to geriatrics. By creating broader categories, the program designers hope to make the information more pertinent to students and avoid the lack of coherence often created by treating topics in isolation.

Admittedly, there is some self-selection built into the group, since those who care most about patients, or making money, are the ones most likely to sign up for the program. The program was described to the incoming class the spring before they began school, and 72 of the 165 students asked to participate. Twenty-four students were chosen by a lottery, weighted to give a fair balance of women and minorities.

Adoption of the program by other medical schools will depend on whether the students currently matriculated in the program are adequately prepared for future duties. Those working for the program rate it as only a mixed success so far.

Negative mood

CAMEROON'S VALLEY OF DEATH

CHICAGO - The patients looked like survivors of chemical warfare. More than 260 were cramped in a tiny, ill-equipped hospital in Wum, a small town near Lake Nios in Cameroon. Some patients had scars on their lungs. Others had paralyzed limbs. One woman had miscarried; another had delivered a stillborn fetus. "We've had one death from pneumonia, or maybe a pulmonary edema-it's hard to tell," said Dr. Christopher Pisoh, the town's chief medical officer. "And they're still coming in.' Six days after a cloud of lethal volcanic gas swept down the valley around Nios, hundreds of burned and blistered survivors were waiting for help. And they were the lucky ones: more than 1,700 people were dead.

NO WARNING: Some of the victims died instantly. "All people heard was the explosion," said Cameroon's President Paul Biya. "They didn't know that toxic gas had been expelled, and it killed them while they were asleep." Francis Fang, a 56-year-old farmer in the village of Cha, was in bed. "My wife dropped on the ground, vomiting blood, " he said. "The children were burning and screaming. My wife was dead. I picked up my girls and started to walk toward the hospital. There were dead people everywhere on the road--so many that I was stepping on them.

Following the catastrophe, Maj. Victor Ngengue directed the Army's relief efforts in Subum, a village that lost half of its 600 inhabitants. The stench of decomposing flesh covered the village. "We have to keep people out of here," Ngengue said. "The animals' bodies have contaminated the water supply." Jongi Zong stood in an adobe house nearby. He had come to Subum from a neighboring village that escaped the toxic fumes to bury his brother and sister-in-law in one grave and the couple's seven children in another. "It was so sudden," he said. "Now they are all gone."

FLY IN: "We need international assistance to cope with this situation," President Biya said. "We need tents, blankets and drugs." More than a dozen countries answered the call. Prime minister Shimon Peres, visiting Cameroon to mark the resumption of diplomatic relations between Cameroon and Israel, brought a 17-member medical team. However the U.S. Agency for International Development said that the United States would not provide emergency relief because of the political tension between the US and the Cameroon. Without the US the Cameroon Army, had a hard time handling the few supplies that were offered. Said one Western diplomat in Cameroon: "Without American aid many people will die, who could have been saved"

The most immediate concern was to bury the dead. Fearing that contamination from rotting human and animal corpses could trigger an epidemic, hundreds of Cameroon soldiers dug mass graves. By the end of the week most of the human victims had been buried, but thousands of cattle and other animal carcasses lay scattered across the valley. Despite the tragedy, only a few villagers talked abut moving away. Most will probably stay on to tend their family farms--and their family graves.

APPENDIX 2: SECOND EXPERIMENT
APPENDIX 2.1: TEST
APPENDIX 2.1.2: COMPUTER SCREENS INSTRUCTIONS

When you are told to

PLEASE PRESS THE SPACE BAR

Hello:

Thank you for your participation in this research project.

You will be asked to participate in 2 separate studies each of which is quite short. They are:

1- Pre-test of material for a future: the evaluation of a newspaper article

2-An unconscious perception study

PLEASE PRESS THE SPACE BAR

Your fist task is the

EVALUATION OF A NEWSPAPER ARTICLE

All the instructions will be given on this computer screen.

PLEASE PRESS THE SPACE BAR

At your left you can see a white paper which contains a copy of a news paper article.

Please read it carefully so that you can form an opinion about its general quality and interest.

Please read the article now and return to this screen after finishing it.

WHEN YOU HAVE FINISHED READING, PLEASE PRESS THE SPACE BAR

How much did you enjoy reading the article?

1 2 3 4 5 6 7
NOT AT ALL A LOT

Press the number that better represents your opinion

How do you rate it?

1 2 3 4 5 6 7
VERY BAD VERY GOOD

Press the number that better represents your opinion

The study you will now be engaged in is a

STUDY OF UNCONSCIOUS PROCESSES

PLEASE PRESS THE SPACE BAR

You will see a black dot in the center of the next screen.

Look attentively at it and notice that it is going to flash twice before it disappears.

The flash will mean that 2 brief sentences were presented for a very brief period of time.

You will not be aware of **actually seeing** those sentences, but some aspects of them will have affected you. Therefore you will be able to guess some of their features (even if you don't think so). This is what we mean by unconscious processing.

PLEASE PRESS THE SPACE BAR

Remember , that you should:

-focus on the dot
-watch for two flashes
-guess about the sentences features

PLEASE PRESS THE SPACE BAR

•

XXXXXXXXXXXXXXXXXXXXXXX

•

Please respond with the first answer that pops into your mind.

My feeling is that the 2 sentences were

TRUE (press T)

FALSE (press F)

How certain are you about the truth or falseness of the sentences? They are:

1	2	3	4	5	6	7
Certainly False	Prob False	Pos False	Uncertain	Prob True	Pos True	Certainly True

Press the number that best represents your opinion

In order to control for some variables that might influence the results of our study we would like you to answer the following questions

PLEASE PRESS THE SPACE BAR

What is you gender?

FEMALE (press F)

MALE (press M)

How do you feel right now?

SAD 1 2 3 4 5 6 7 8 9 HAPPY

Press the number that best represents your opinion

What class are you?

FRESMAN (press F)

SOPHOMORE (press P)

JUNIOR (press J)

SENIOR (press S)

How would you describe your mood at this time?

BAD 1 2 3 4 5 6 7 8 9 GOOD

Press the number that best represents your opinion

You have now finished your participation in the two studies.

Thank you for your participation.

Please wait until the experimenter arrives.

PLEASE DO NOT PRESS ANY MORE KEYS.

THANK YOU FOR YOUR PARTICIPATION.

Pairwise comparisons: LSD Tests - Probabilities for Post Hoc Tests (Bilateral tests)
Design: 3 mood states
Dependent variable: Mood ratings

	Means	NEGATIVE **6.12**	NEUTRAL **5.70**	POSITIVE **6. 52**
NEGATIVE	**6.12**	----------	p<.180	p<.388
NEUTRAL	**5.70**	p<.180	------------	p<.032*
POSITIVE	**6.52**	p<.388	p<.032*	

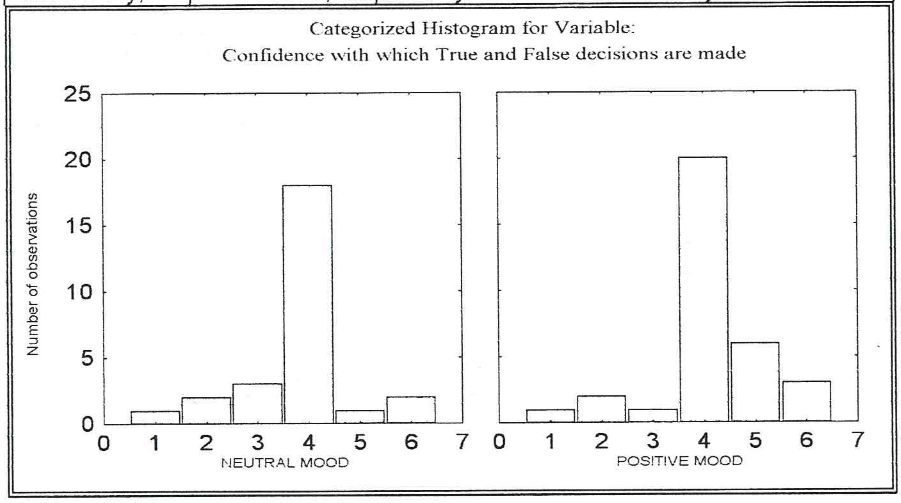
Distribution of False and True responses:
Frequencies and probabilities associated with each mood state
$X^2(1, N= 60) = 4.79, p <0.03$

Type of judgment	NEUTRAL MOOD	POSITIVE MOOD	TOTAL
False	**17** 62.96%	**11** 34.38%	**28** 100%
True	**10** 37.04%	**21** 65.63%	**31** 100%

Means + Standard desviations + Anova: Summary of all Effects.
Design: 2 mood states
Dependent variable: Confidence in Truth ratings

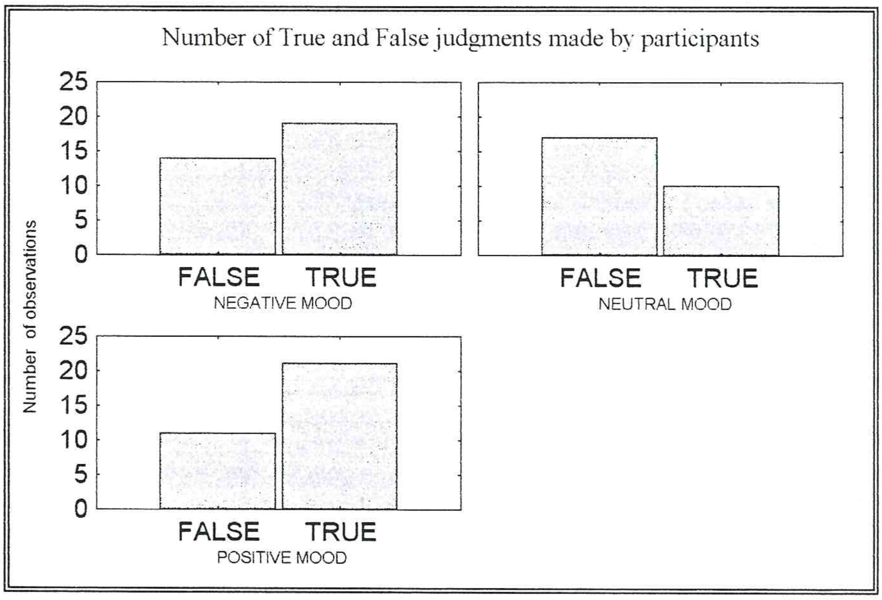
	Neutral Mood		**Positive Mood**					
	Mean	**SD**	**Mean**	**SD**	**df**	**MS**	**F**	**p-level**
Mood	3.85	1.06	4.09	1.04	1	.848	.767	.385
Error					58	1.105		

Distribution of Truth ratings
1= certainly false, 2 = probably false, 3= possibly false, 4= completely uncertainty, 5= possible true, 6= probably true and 7 = certainly true



Analyse of data of the three experimental conditions (negative, neutral and positive mood)

Since participants in the negative mood condition report to be in a slight good mood state, it is not surprising that the pattern of results associated with this condition presents a better map to the one of the positive mood conditions than the one of the neutral mood condition.



Analyse of relative distribution of True and False judgments: General and Partial Pearson Chi Square			
	Chi-square	**df**	**p-level**
General analyse of the 3 groups	5.040	2	p<.08
Comparison: Negative/Neutral	2.509	1	p<.12
Comparison: Negative/Positive	.445	1	p<.51

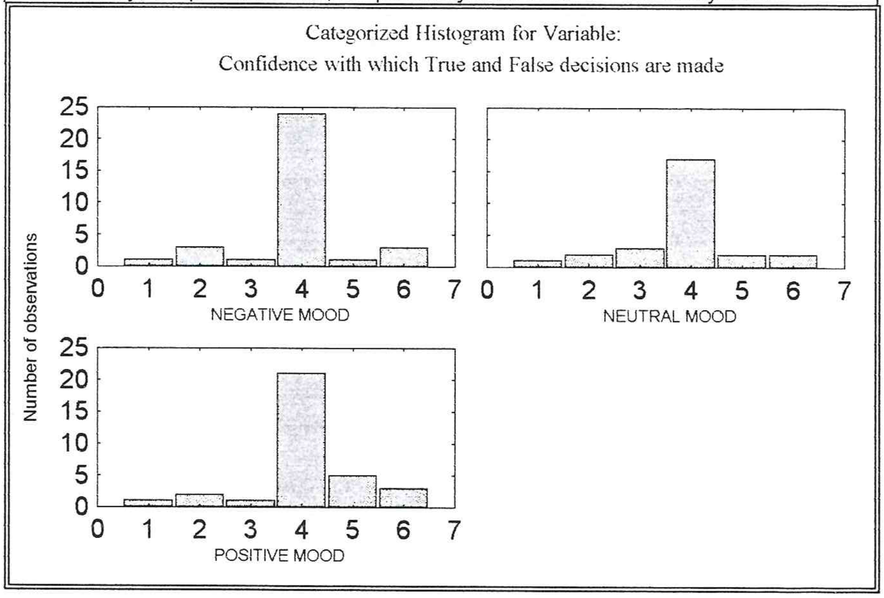
Means + Standard desviations + Anova: Summary of all Effects.
Design: 3 mood states
Dependent variable: Confidence in Truth ratings

	Negative Mood Mean	SD	Neutral Mood Mean	SD	Positive Mood Mean	SD	df	MS	F	p-level
Mood	3.91	1.04	3.85	1.06	4.09	1.04	1	.848	.767	.385
Error							58	1.105		

Pairwise comparisons: LSD Tests - Probabilities for Post Hoc Tests (Bilateral tests)
Design: 3 mood states
Dependent variable: Truth ratings

	Means	NEGATIVE **3.91**	NEUTRAL **3.85**	POSITIVE **4.09**
NEGATIVE	**3.91**	----------	p<.833	p<.483
NEUTRAL	**3.85**	p<.833	------------	p<.382
POSITIVE	**4.09**	p<.483	p<.382	

Distribution of Truth ratings
1= certainly false, 2 = probably false, 3= possibly false, 4= completely uncertainty, 5= possible true, 6= probably true and 7 = certainly true



APPENDIX 3

THIRD EXPERIMENT

3.1Test
- 3.1.1.Instructions: Computer screens
- 3.1.2.Two versions of Acid Rain persuasive message

3.2.Reported data
- 3.2.1.Attitudinal judgments
- 3.2.2.Message reading times
- 3.2.3.Attitudinal judgments latency

APPENDIX 3: THIRD EXPERIMENT
APPENDIX 3.1: TEST
APPENDIX 3.1.1: Ex: COMPUTER SCREENS INSTRUCTIONS

When you are told to

PLEASE PRESS THE SPACE BAR

Hello:

Thank you for your participation in this research project.

All the instructions for this study will be given on this computer screen.

Please do only what you are asked to do, and only when you are asked to do it.

Thanks for your cooperation

PLEASE PRESS THE SPACE BAR

The study you are participating in focuses on the

EVALUATION OF THE QUALITY OF A TAPE RECORDING

In order to use different tapes with different voices in a future study , we need to make them equivalent with regard to some of their features. So we asking a group of participants like yourselves to rate some of the tape's features for us.

PLEASE PRESS THE SPACE BAR

You will be asked to listen carefully to the tape recording with a female voice discussing a certain issue, and to give us your opinion about some of its features.

PLEASE PRESS THE SPACE BAR

So you will first be given a feature to evaluate. Then you will listen to the tape until you hear a BEEP. When you hear the BEEP press the STOP button, and look back to the computer for further instructions. Then you will indicate your opinion regarding the specific feature of the tape by pressing a number between 1 and 7 on your keyboard.

You should use the keys we select for this on your keyboard

Find them now!

PLEASE PRESS THE SPACE BAR

To summarize:

1-you will be given a task

2-you will listen to the tape

3- you will press STOP you hear the BEEP and return to the computer screen

4-you will give us your opinion about the tape

PLEASE PRESS THE SPACE BAR

You can see the tape recorder and its headphones to your right.

Please finish reading the instructions before you press any button on the recorder. You will be asked to perform a certain task as you listen to the tape.

PLEASE PRESS THE SPACE BAR

Remember that you will:

1-get a task
2- listen to the tape
3-press STOP when you hear the BEEP
4-give us your opinion about the tape

PLEASE PRESS THE SPACE BAR

If you are unsure about any of the instructions please call the experimenter now.

If not please put on the headphones and

PRESS THE SPACE BAR to receive your task

Your first task is to ...

PLEASE PRESS THE SPACE BAR

Evaluate the **SOUND QUALITY** with which the tape was recorded.

Please attend only to the sound quality of the tape.

Remember that you should press the STOP bottom and return to this screen as soon as you hear the BEEP.

PRESS THE **PLAY** BUTTON NOW.

PLEASE PRESS THE SPACE BAR ONLY AFTER HEARING THE BEEP

In my opinion the **sound quality** of the tape is

1 2 3 4 5 6 7
POOR GOOD

Press the number that best represents your opinion

After we define your next task you are going to listen to the same message again.

You will not need to rewind the tape

Your second task is to ...

PLEASE PRESS THE SPACE BAR

Evaluate the PITCH of the female voice.

Is it higher or lower compared to your idea of a typical female voice?

Please attend only to the pitch of the voice on the tape.

Remember that you should press the STOP button and return to this screen the moment you hear the BEEP.

PRESS THE **PLAY** BUTTON NOW.

PLEASE PRESS THE SPACE BAR ONLY AFTER HEARING THE BEEP

In my opinion the **pitch** of the voice recorded is

VERY LOW	1	2	3	4	5	6	7	VERY HIGH

Press the number that best represents your opinion

You are going to listen the same message, with another task in mind

Your third task is to ...

PLEASE PRESS THE SPACE BAR

Evaluate the PACE with which the message is read

Please attend only to the pace of the reading in the tape. Is it too slow , too fast, is it OK?

Remember that you should press the STOP bottom and return to this screen the moment you hear the BEEP.

PRESS THE **PLAY** BUTTON NOW.

PLEASE PRESS THE SPACE BAR ONLY AFTER HEARING THE BEEP

In my opinion the **pace** of the reading is

VERY SLOW	1	2	3	4	5	6	7	VERY FAST

Press the number that best represents your opinion

You are going to listen again to the same message, but with yet another different goal in mind.

Your fourth task is to ...

PLEASE PRESS THE SPACE BAR

Evaluate the **clarity** of the female's pronunciation.

Are the words clear or difficult to understand?

Please attend only to the clarity of the voice in the tape.

Remember that you should press the STOP button and return to this screen the moment you hear the BEEP.

PRESS THE **PLAY** BUTTON NOW.

PLEASE PRESS THE SPACE BAR ONLY AFTER HEARING THE BEEP

In my opinion the **clarity** of pronunciation is generally

VERY BAD	1	2	3	4	5	6	7	VERY GOOD

Press the number that best represents your opinion

Again the same message, and a different goal

Your fifth task is to ...

PLEASE PRESS THE SPACE BAR

Evaluate the ELOQUENCE of the reading.

Please attend only to the eloquence of the reading. Is the reading expressive and vivid or is it dull and boring?

Please attend only to the eloquence of the reading.

Remember that you should press the STOP button and return to this screen the moment you hear the BEEP.

PRESS THE **PLAY** BUTTON NOW.

PLEASE PRESS THE SPACE BAR ONLY AFTER HEARING THE BEEP

In my opinion the **eloquence** of the reading is

VERY DULL	1	2	3	4	5	6	7	VERY VIVID

Press the number that best represents your opinion

Before you finish your participation in this study ,

we will ask you to complete one more task

PLEASE PRESS THE SPACE BAR

On the next screen you will be presented with a statement regarding the issue of whether the government should impose a number of controls on American industry to help minimize the effect of acid rain on the North Eastern states.

PLEASE PRESS THE SPACE BAR

On the next screen you will see the issue you have been listening to.

Please read it carefully in order to give us your opinion regarding the issue of whether the government should impose a number of controls on American industry to help minimize the effect of acid rain on the North Eastern states.

PLEASE PRESS THE SPACE BAR

PRESENTATION OF

STRONG OR WEAK

CONTRATTITUDINAL

MESSAGE

How much do you agree or disagree with the statement that

The government should impose control on industry to help minimize the effect of acid rain in the North Eastern states.

1	2	3	4	5	6	7
Strongly disagree						Strongly agree

Press the number that best represents your opinion

You have now finished your participation in the this study.

Thank you for your participation.

Please wait until the experimenter arrives.

APPENDIX 3: THIRD EXPERIMENT
APPENDIX 3.1: TEST
APPENDIX 3.1.2: TWO VERSIONS OF ACID RAIN PERSUASIVE MESSAGE

STRONG VERSION

I'm strongly opposed to imposing governmental controls to minimize the effects of acid rain on the North Eastern states.

Recently completed studies have shown that most of the increase in the acidity of our lakes and atmosphere is due to increased urbanization in the northern United States, and that geographic changes, such as widespread deforestation, have also contributed to it.

The deacidifying effect of large scale forest burn-offs now no longer occurs, with the result that atmospheric acidity levels have steadily climbed.

Solving these demographic and geographic problems would have a more beneficial effect than imposing controls on industry. As the installation of sulfur dioxide emissions control devices is extremely expensive such a move would be economically detrimental. American industry would be faced with a large financial burden at a time when it must focus all its financial energies on increased production to compete with ever-growing foreign competition. A Hudson study calculates that it would cost $100 billion to achieve a major reduction in sulfur dioxide emissions. This cost would not only be to industry, but also to the American taxpayer.

As the evidence indicates that the contribution of industrial emissions to acid rain is minimal, there is no justification for engaging in a program of this expense.

PLEASE PRESS THE SPACE BAR

WEAK VERSION

I'm strongly opposed to imposing governmental controls to minimize the effects of acid rain on the North Eastern states.

People who think that acid rain is caused by Midwestern factories and is raining down on Eastern forests and lakes don't recognise that the material they say is in the air has probably always been there. It is my belief that it is just that in the last six years they have started to measure the presence of acid rain and so now it is noticeable. Most people who live in the East have not noticed any big differences in their air or water quality which is better that in most big cities in America. If the problem was really so bad you'd think that people would be demonstrating their discontent by moving out of the area.

There is no problem with the acidity in the air or water in the Midwest region, and it seems unfair to make people in the area responsible for the problems in other regions. States independence has always been an important American virtue and it should be encouraged rather than undermined.

Everyone is always blaming American industry for everything, and using it as an excuse to increase bureaucracy. Factories in other countries do not have to be burdened with regulations and neither should American companies.

PLEASE PRESS THE SPACE BAR

Attitudinal judgments (Non-inverted values)
Means and Standard desviations and sample dimension
Design: 4 (Level of Repetition) x 2(Argument Quality)

	WEAK			STRONG		
	Mean	Sdt.Desv	N	Mean	Sdt.Desv	N
Control (no-repetition)	5.27	1.33	15	4.07	1.82	14
One repetition	4.47	1.13	15	4.42	1.38	12
Two repetitions	4.63	1.90	16	4.53	1.18	15
Four repetitions	4.50	1.79	16	4.50	1.60	16

Anova assumptions: Between design
Design: Level of Repetition x Argument Quality
Dependent variable: Attitudinal judgments

Tests of Homogeneity of Variances					Fit to Normal Distribution				
Hartley F-max	Cochran C	Chi-Square	df	p	Kolmogorov-Smirnov d	p	Chi-Square	df	p
2.829	.189	7.476	7	.381	.113	.10	127.34	9	.000

Summary of Planned comparison: orthogonal contrasts defined by the Helmet contrast matrix
Contrast factors (between group): Level of Repetition x Argument Quality
Dependent variable: Attitudinal judgments

	LEVELS OF REPETITION 0	1	2	4	Sum of Squares	df	Mean Square	F	Bilateral p-level	Unilateral p-level
WEAK	-3	1	1	1						
STRONG	3	-1	-1	-1	7.20	1	7.20	3.01	.085	.0425
WEAK	0	-2	1	1						
STRONG	0	2	-1	-1	.0001	1	.0001	.00003	.995	----
WEAK	0	0	-1	1						
STRONG	0	0	1	-1	.0331	1	.033	.0138	.907	
Error					265.99	111	2.40			

Anova: Summary of all Effects.
Design: 4 (Level of Repetition) x 2(Argument Quality)
Dependent variable: Attitudinal judgments

	df	MS	F	p-level
Level of repetition	3	.277	.12	.951
Argument quality	1	3.30	1.38	.243
Interaction	3	2.42	1.01	.392
Error	111	2.40		

Message reading time data:
Means (Msec) and Standard desviations
Design: 4 (Level of Repetition) x 2(Argument Quality)

	WEAK		**STRONG**	
	Msec	SD	Msec	SD
Control (no-repetition)	63803	12474	71041	23904
One repetition	62021	18753	68028	23292
Two repetitions	52181	27190	72824	23332
Four repetitions	60531	17521	70711	25146

Anova assumptions: Between design
Design: Level of Repetition x Argument Quality
Dependent variable: Message reading times

Tests of Homogeneity of Variances					**Fit to Normal Distribution**				
Hartley F-max	Cochran C	Chi-Square	df	p	Kolmogorov-Smirnov d	p	Chi-Square	df	p
7.938	.275	23.336	7	.0015	.036	n.s	14.067	9	.1200

Anova: Summary of all Effects.
Design: 4 (Level of Repetition) x 2(Argument Quality)
Dependent variable: Message reading time (msec)

	df	**MS**	**F**	**p-level**
Level of repetition	3	1962369920	1.88	.137
Argument quality	1	8997048320	8.62	.004
Interaction	3	316503040	.30	.823
Error	111	1043769408		

Attitudinal judgments latency
Means (Msec) and Standard desviations
Design: 4 (Level of Repetition) x 2(Argument Quality)

	WEAK		STRONG	
	Msec	SD	Msec	SD
Control (no-repetition)	18314	9087	16264	7693
One repetition	17452	8967	17566	10343
Two repetitions	17144	6973	14876	7178
Four repetitions	18657	10647	15840	7077

Anova assumptions: Between design
Design: Level of Repetition x Argument Quality
Dependent variable: Attitudinal judgment latency (log-latency)

Tests of Homogeneity of Variances					**Fit to Normal Distribution**				
Hartley F-max	Cochran C	Chi-Square	df	p	Kolmogorov-Smirnov d	p	Chi-Square	df	p
4.635	.245	9.862	7	.196	.085	n.s	11.870	4	.018

Anova: Summary of all Effects.
Design: 4 (Level of Repetition) x 2(Argument Quality)
Dependent variable: Attitudinal judgment latency (log-latency)

	df	MS	F	p-level
Level of repetition	3	.073	.234	.872
Argument quality	1	.224	.715	.399
Interaction	3	.020	.066	.977
Error	111	.313		

APPENDIX 4

FOURTH EXPERIMENT

4.1.Test
- 4.1.1.Instructions: Computer screens
- 4.1.2.Two versions of Weight Loss persuasive messages

4.2.Reported data
- 4.2.1.Attitudes on the priming issue
- 4.2.2.Mood assessment
- 4.2.3.Attitudes on the target issue

APPENDIX 4: FORTH EXPERIMENT
APPENDIX 4.1: TEST
APPENDIX 4.1.1: Ex: COMPUTER SCREENS INSTRUCTIONS

1.

When you are told to

PLEASE PRESS THE SPACE BAR

2.

Hello:

Thank you for your participation in this research project.

The study you are participating in focuses on the interference of executing double tasks in performance.

All the instructions for this study will be given on this computer screen.

Please do only what you are asked to do, and only when you are asked to do it.

Thanks for your cooperation

PLEASE PRESS THE SPACE BAR

3.

In order to control for some variables that might influence the results of our study we would like you to answer some questions before completing the experiment.

- The first set of questions asks about demographic characteristics

- The second set of questions ask about opinions and feelings

PLEASE PRESS THE SPACE BAR

4.

What is your gender?

FEMALE (press F)

MALE (press M)

5.

What class are you?

FRESMAN (press F)

SOPHOMORE (press P)

JUNIOR (press J)

SENIOR (press S)

6

How old are you?

(use the numbers marked with a dot on your keyboard)

7

Do you have any problems with deafness of difficult hearing?

Yes (press Y)

No (press N)

8

To help you answer the next questions we would like you to use a *feeling thermometer*.

Like a regular thermometer, a *feeling thermometer* measures all the way from cold to hot. You can use the feeling thermometer to show how "cold" or "hot" you feel about various things.

If you disagree or dislike something, you can give it a "cold" rating, choosing a temperature somewhere between 0 and 49.

On the other hand, if you like or agree with something you can give it a hot rating somewhere between 51 and 100.

PLEASE PRESS THE SPACE BAR

9

For example, when you see a statement like:

The government should reduce taxes

you can select a temperature that best represents your feelings toward the issue.
If you agree that the government should reduce taxes you can respond with a number that represents a warm or hot feeling. The more you agree with the statement, the higher the temperature rating you can give it.

If you disagree with the statement you should give it a number associated with a cold feeling. The more you disagree with the statement, the colder the rating you should give it.

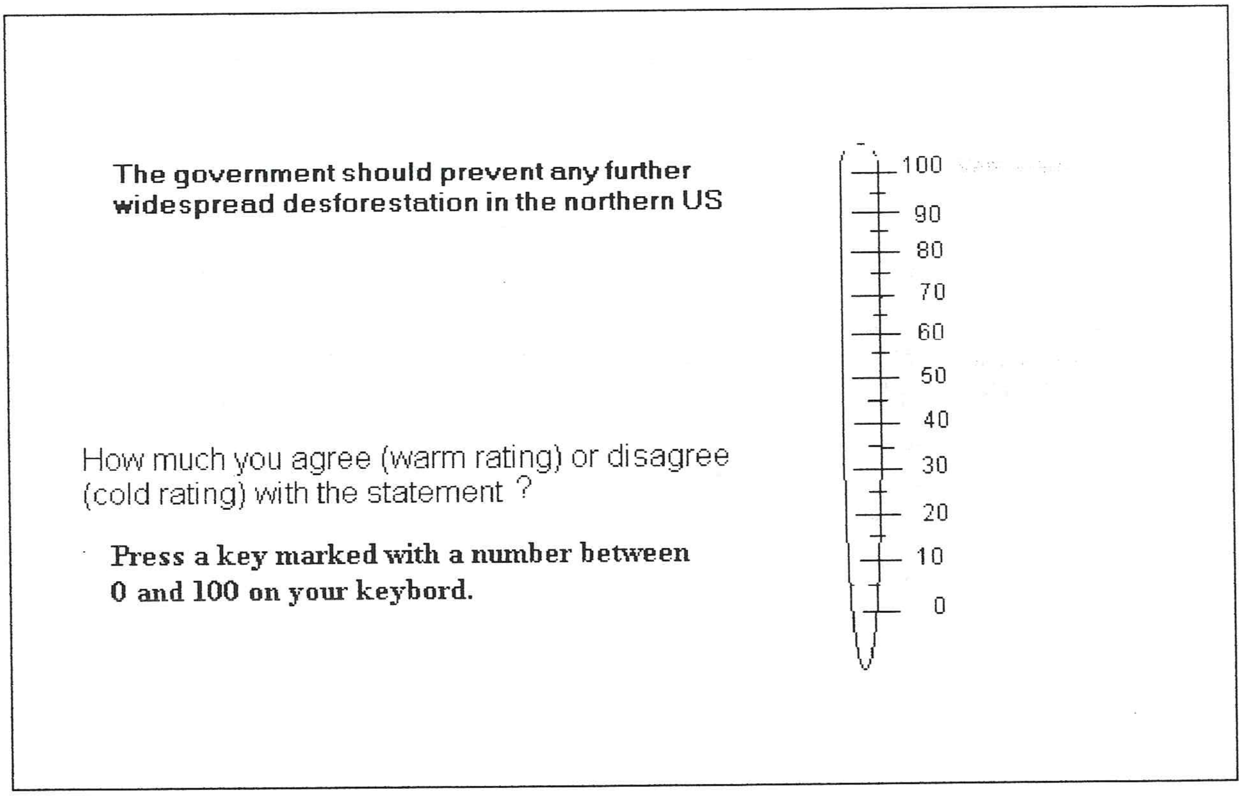
If you are totally indifferent to the issue you should choose a number near 50.

PLEASE PRESS THE SPACE BAR

In the following 10 screen each of these sentences was presented as it is illustrated below:

10-20

- The government should prevent any further widespread deforestation in the northern US
- Government should impose controls on industry to help minimize the effect of acid rain in US
- Oil drilling off the US coast should be increased so that we are not so dependent on foreign oil.
- Weigh Loss Centers are places where people can safely and effectively lose weight
- Anti-smoking programs have been effective in preventing cigarette addiction
- Smog checks on automobiles have been effective in reducing air pollution
- I am used to reading newspaper articles in crowded and noisy environments
- I am used to studying in crowded and noisy environments
- I frequently have the TV or radio on when I am doing casual reading
- I frequently have the TV or radio on when I am doing even important reading
- It is very hard for me to concentrate on any kind of task



21

More and more frequently in our lives we are exposed to different sources of information simultaneously.

For example:
We can talk with a friend with the TV or the radio on, and have some idea of what is going on.
We can be reading a book or a magazine and have some idea of what the conversation that is taking place near us, is about.

In this experiment we are going to study this type of situation.

PLEASE PRESS THE SPACE BAR

22

All the participants of this study will be given two similar tasks.

Some will perform these tasks simultaneously and other will perform them sequentially.

EXPERIMENTAL CONDITION

23

You will be asked to perform both tasks simultaneously.

PLEASE PRESS THE SPACE BAR

CONTROL CONDITION

23

You will be asked to perform both tasks sequentially.

PLEASE PRESS THE SPACE BAR

24

So you will be given two tasks.

A ***reading*** task and a ***hearing*** task.

Your main, first and most important task, is the reading one. That is the task we want you to attend to. It is **your** task.

The hearing task is your secondary task, and simulates your environment. We expect you to listen to it, but you should not be concerned with it.

PLEASE PRESS THE SPACE BAR

25

Please read very carefully and attentively the text that is going to be presented on this screen . You will be asked some questions regarding the way you see this issue.
At the same time you will be listening to a tape recording with a male voice discussing a totally different issue.

PLEASE PRESS THE SPACE BAR

26

In some conditions we will **also** ask some questions regarding the issue that was audio-presented. We will not tell you in advance in what condition you are, so be prepared to answer any question about that issue, if you are asked to.

Remember , we explicitly told you to direct all your attention to the reading, so please do it, but try also not to block the possibility of hearing the contents of the talk you will be listening to.

27

Do not in any case interrupt your reading to attend to the tape record .

Remember your main task is the reading.

34

Although some of your colleagues will now be asked now about the message you were listening to, you will not be asked.
To the contrary, we will present you in the next screen with the message you were listening to.
Please read it carefully in order to give us your opinion regarding the issue of whether the government should impose a number of controls on American industry to help minimize the effect of acid rain on the North Eastern states.

PLEASE PRESS THE SPACE BAR

28

Now for your second task, in the next screen you are going to be presented with a different message.
Please read it carefully in order to give us your opinion regarding the issue of whether the government should impose a number of controls on American industry to help minimize the effect of acid rain on the North Eastern states.

PLEASE PRESS THE SPACE BAR

35 29

PRESENTATION OF A CONTERATTITUDINAL
WEAK OR STRONG VERSION OF A MESSAGE REGARDING THE ACID RAIN ISSUE

For mood measure before attitude:

Please tell us, first

How do you feel right now?

1 2 3 4 5 6 7 8 9
SAD HAPPY

(press the number that best represents your opinion , using the keys that are signal with small dots)

How would you describe your mood at this time?

1 2 3 4 5 6 7 8 9
BAD GOOD

(press the number that best represents your opinion , using the keys that are signaled with small dots)

What do you think about the issue presented in the text?

How much do you agree or disagree with the following statements?

PLEASE PRESS THE SPACE BAR

For mood measure after attitude:

What do you think about the issue presented in the text?

How much do you agree or disagree with the following statements?

PLEASE PRESS THE SPACE BAR

In the following 3 screens each of these sentences was presented in association with the feeling thermometer as in the previous attitude measures.

1. The government should impose control on industry to help minimize the effect of acid rain in the North Eastern states.
2. Increases in problems with acid rain in the Northeastern US should not be blamed on the activities of industries operating in the Midwest
3. The government should require the installation of sulfur dioxide emissions control devices in factories operating in the Midwest.

Please tell us, now

How do you feel right now?

1 2 3 4 5 6 7 8 9
SAD HAPPY

(press the number that best represents your opinion , using the keys that are signal with small dots)

In the following 3 screens each of these sentences was presented in association with the feeling thermometer as in the previous attitude measures.

1. The government should impose control on industry to help minimize the effect of acid rain in the North Eastern states.
2. Increases in problems with acid rain in the Northeastern US should not be blamed on the activities of industries operating in the Midwest
3. The government should require the installation of sulfur dioxide emissions control devices in factories operating in the Midwest.

How would you describe your mood at this time?

1 2 3 4 5 6 7 8 9

BAD GOOD

(press the number that best represents your opinion , using the keys that are signaled with small dots

You have now completed participation in this study.

The experimenter will now take you to another room where you will receive further instructions.

Please wait until the experimenter arrives

PLEASE DO NOT PRESS ANY MORE KEYS.

THANK YOU FOR YOUR PARTICIPATION.

STRONG VERSION

I am strongly in favor of Weight Loss Centers as places where people can safely and effectively loose weight. There are at least a couple of reasons for advocating such a position.

First of all, it is important to understand that the goal of the most commercial diet programs is not, and will never be, simply to help people to loose weight. Their special concern is in teaching people how to maintain a good and healthy lifestyle.

Second, most Weight Loss Centers have the advantage of having qualified personnel on hand. Weight Loss Center counselors are specially trained to deal with their often vulnerable clients. These instructors not only have to have prior relevant knowledge but must also undergo intense training sessions sponsored by the Center.

One important aspect of this training is that weight loss counselors at most centers are instructed in the use of behavior modification techniques. These are techniques that teach participants how to reward behavior that promotes their goals and to reduce behaviors that interfere with loosing weight and becoming healthier. These techniques also effectively increase client's self-esteem and feeling of control. This work is usually supervised by psychologists or behavior therapists

PLEASE PRESS ENTER TO CONTINUE

In addition to weight loss counselors, most diet centers employ licensed fitness trainers. These fitness trainers develop complete programs of exercises adapted to each case. These fitness programs are designed and adapted for the general overweight population, preventing any dangerous use of exercise for these people. We have to remember that not all forms of exercise are good in all phases of the process of loosing weight. Commercial weight loss centers thus have fully developed programs of exercise that are safe and efficient in attaining the proper goals.

Weight loss Centers are also monitored full time by qualified medical professionals. In these ways these programs ensure people that all aspects related with weight loss are paid careful attention: nutrition, exercise, psychological support, and education related to better and healthier lifestyles.

Perhaps this is the reason that over the years a great number of these centers have demonstrated that they produce the kind of lifestyle changes necessary for clients not only to safely loose weight but more importantly to keep the weight off.

For all these reasons I believe that not only people can safely and effectively loose weight with these programs, but also that this is one of the best ways of doing it.

PLEASE PRESS THE SPACE BAR

WEAK VERSION

I am strongly in favor of weight loss centers as places where people can safely and effectively loose weight. There are at least a couple of reasons for advocating such a position.

First of all, it is important to understand that if so many people use commercial weight loss programs these programs must be an effective way to loose weight.

Second, we have to understand that attending the program's weekly meeting is a really good and healthy way to spend time and meet new people. A lot of overweight people might not do this if it wasn't for these centers.

One of the important aspects of these weight loss centers is that most of the clients who use commercial diet centers report little or no feeling of hunger or deprivation while participating in the program. Although there might be some complaints about some things that go on, people seem to be pretty satisfied with what they are allowed to eat and drink on these programs.

PLEASE PRESS ENTER TO CONTINUE

I know that some commercial weight loss programs have recently been said to cause different kinds of health problems, but I believe that most of the claims of heath problems arising from the general use of diet centers are unfounded and simply reflect exploitation by unscrupulous attorneys. We must remember that people who join a weight Loss center program usually expect the center to perform miracles without their having to put any time and effort into it. The people who join are also pretty vulnerable psychologically. These are just the characteristics that make the users of weight loss centers really easy targets for the kind of arguments used by unscrupulous attorneys who want to cause trouble for the centers while filling their own pockets.

In addition, when we compare the programs offered in weight loss centers and what people do when they try to loose weight at home alone, it turns out that the food products manufactured for specific weight loss programs are usually less expensive than comparable non-programs foods. People don't think about that when they complain about the centers. So it seems self evident the benefits of using these programs in terms of overall quality of life far outweigh the monetary cost.

For all these reasons I believe that not only people can safely and effectively lose weight with these programs, but also that this is one of the more enjoyable ways of doing it.

PLEASE PRESS THE SPACE BAR

Reliability Analysis
Summary for scale: Mean=19.3547 Std.Dv.=5.52334 Valid N:193
Cronbach alpha: **.695** Standardized alpha: **.699** Average inter-item corr.: **.540**

Items	Mean if deleted	Var. if deleted	StDv. if deleted	Item-Total Correl.	Alpha if deleted
Weight Loss Centers are places where people can safely lose weight	13.197	15.133	3.890	.608	.485
Weight Loss Centers offer good support to those who want to lose weight	12.591	15.423	3.927	.562	.669
Weight Loss Centers do not offer ways of effectively losing weight (Inverted)	12.921	16.082	4.010	.572	.651

Factor Analysis Extraction: Principal components
Eigenval(Expl.Var)= **1.88** Proportion of Total Variance = **.626**

Items	1 Factor: Factor Loadings
Weight Loss Centers are places where people can safely lose weight	.854
Weight Loss Centers offer good support to those who want to lose weight	.751
Weight Loss Centers do not offer ways of effectively losing weight (Inverted)	.765

Attitudinal judgments towards priming issue
Means and Standard deviations and sample dimension
Design: 2(Repetition vs Nonrepetition) x 2(Argument Quality)

		Post message Attitudes		Covariate (Pre-message Att)			N
		Mean	Sdt.Desv	Mean	Sdt.Desv	Adjust Mean	
Non-Rep	STRONG	6.68	1.79	4.57	2.06	6.68	53
	WEAK	5.87	1.69	4.24	2.56	6.00	50
Repetiton	STRONG	7.29	1.29	4.57	2.27	7.29	44
	WEAK	6.75	1.62	4.89	2.45	6.63	46

Ancova assumptions:
Design: 2 (Repetition vs Non-repetition of target message) x 2(Argument Quality)
Dependent variable: Attitudinal judgments towards priming issue

	Tests of Homogeneity of Variances					Fit to Normal Distribution				
	Hartley F-max	Cochran C	Bartlett Chi-sqr	df	p	Kolmogorov -Smirnov d	p	Chi-Square	df	p
Post-Att	1.929	.309	5.136	3	.162	.050	n.s	30.888	12	.002
Pre-Att	1.541	.298	2.641	3	.450	1.36	.01	46.09	8	.000

Parallelism of regression lines				
	df	MS	F	p-level
Effect	3	3.890	2.154	.095
Error	185	1.806		

Ancova: Summary of all Effects.
Design: 2 (Repetition vs Non-repetition of target message) x 2(Argument Quality)
Dependent variable: Attitudinal judgments towards priming issue

	df	MS	F	p-level
Covariate	1	150.365	81.450	.0000
Repetition vs Non-repetition	1	18.574	10.068	.002
Argument quality	1	21.760	11.794	.0007
Interaction	1	.003	.002	.967
Error	188	1.845		

Regression Results:
Dependent variable: Attitudinal judgments towards priming issue
R: .550 R-square: .302 F(1,188) = 81.50 p <.00001

Independent variable	B-weight	Standard Error	beta	t (188)	p-level
Pre-message attitude	.381	.042	.550	9.03	.0000

Mood ratings

Means and Standard deviations and sample dimension

Design: 2 (Repetition vs Non-repetition of target message) x 2(Argument Quality) x 2(Order of measurment)

		Mood -Attitude			Ãttitude-mood		
		Mean	Sdt.Desv	N	Mean	Sdt.Desv	N
Non-repetition	Strong	4.782	1.312	23	6.739	1.053	23
	Weak	4.230	1.632	26	6.259	1.430	27
Repetition	Strong	5.500	1.532	24	6.086	.996	23
	Weak	5.520	1.636	25	6.400	1.391	20

Anova assumptions:
Design: 2 (Repetition vs Non-repetition of target message) x 2(Argument Quality) x 2(Order of measurment)
Dependent variable: Mood ratings

Tests of Homogeneity of Variances					Fit to Normal Distribution				
Hartley F-max	Cochran C	Bartlett Chi-sqr	df	p	Kolmogorov-Smirrnov d	p	Chi-Square	df	p
2.698	.173	10.114	7	.182	. 126	.01	214.810	12	.000

Anova: Summary of all Effects.
Design: 2 (Repetition vs Non-repetition of target message) x 2(Argument Quality) x 2(Order of measurment)
Dependent variable: Mood ratings

	df	MS	F	p-level
Repetition vs Non-repetition	1	6.622	3.375	.068
Argument quality	1	1.446	.737	.392
Order of measurement	1	88.045	44.879	.0000
Repetition x Arg Quality	1	5.517	2.812	.095
Repetition x Order meas.	1	18.781	9.573	.002
Arg quality x Order meas.	1	.394	.201	.654
Repet. X Arg.Qual.x Order	1	.144	.074	.786
Error	183	1.961		

Mood ratings **Means** Design: 2 (Repetition vs Non-repetition of target message) x 2(Order of measurment)		
	Mood -Attitude	**Attitude-mood**
Non-repetition	4.506	6.499
Repetition	5.510	6.243

Post-Hoc Comparisons
Design: 2 (Repetition vs Non-repetition of target message) x 2(Order of measurment)
Dependent variable: Mood ratings

Comparison between non-repetition and repetition conditions		**df**	**MS**	**F**	**p-level**
When mood is measured before attitude	Effect	1	24,61108	12,54498	,000504
	Error	183	1,96183		
When mood is measured after attitude	Effect	1	1,503296	,766273	,382520
	Error	183	1,961828		

Reliability Analysis
Summary for scale: Mean=20.161 Std.Dv.= 5.012 Valid N:189
Cronbach alpha: .648 Standardized alpha: .650 Average inter-item corr: .567

Items	Mean if deleted	Var. if deleted	StDv. if deleted	Item-Total Correl.	Alpha if deleted
The government should impose control on industry to help minimize the effect of acid rain in the North Eastern states.	13.000	12.060	3.472	.578	.485
Increases in problems with acid rain in the Northeastern US should not be blamed on the activities of industries operating in the Midwest (Inverted)	14.085	15.626	3.953	.561	.502
The government should require the installation of sulfur dioxide emissions control devices in factories operating in the Midwest	13.236	11.497	3.391	.572	.484

Factor Analysis Extraction: Principal components
Eigenval(Expl.Var)= **1.81** Proportion of Total Variance = **.603**

Items	1 Factor: Factor Loadings
The government should impose control on industry to help minimize the effect of acid rain in the North Eastern states	.878
Increases in problems with acid rain in the Northeastern US should not be blamed on the activities of industries operating in the Midwest (Inverted)	.516
The government should require the installation of sulfur dioxide emissions control devices in factories operating in the Midwest	.878

Attitudinal judgments towards target issue
Means and Standard deviations and sample dimension
Design: 2(Repetition vs Nonrepetition) x 2(Argument Quality) x 2 (Order of Measurement)

			Post message Attitudes		Covariate (Pre-message Att)			N
			Mean	Sdt.Desv	Mean	Sdt.Desv	Adjust Mean	
MOOD-ATT	Non-Rep	STRONG	6.321	1.757	7.962	1.562	6.358	26
		WEAK	7.469	1.564	8.519	1.602	7.330	27
	Repetiton	STRONG	6.710	1.361	7.739	1.287	6.818	23
		WEAK	6.232	1.590	7.217	2.194	6.505	23
ATT-MOOD	Non-Rep	STRONG	6.619	1.704	8.190	1.965	6.584	21
		WEAK	7.605	1.459	8.296	1.683	7.536	27
	Repetiton	STRONG	6.254	1.619	8.238	1.700	6.204	21
		WEAK	6.857	1.515	8.476	1.721	6.731	21

Ancova assumptions:
Design: 2 (Repetition vs Non-repetition of target message) x 2(Argument Quality) x 2(Order of measurment)
Dependent variable: Mood ratings

	Tests of Homogeneity of Variances					Fit to Normal Distribution				
	Hartley F-max	Cochran C	Bartlett Chi-sqr	df	p	Kolmogorov-Smirnov d	p	Chi-Square	df	p
Post-Att	1.668	.155	2.114	7	.953	.037	n.s	42.419	12.	.000
Pre-Att	2.907	.200409	7.535	7	.375	.09091	.10	40.807	3	.000

Parallelism of regression lines

		df	MS	F	p-level
Global design	Effect	7	4.3452	2.063	.050
	Error	173	.106		
Repetition vs Non-repetition	Effect	1	15.332	7.232	.007
	Error	179	.119		

Regression Results:
Dependent variable: Attitudinal judgments towards target issue
Independent variable: Pre-message attitude towards the target issue

	R	(R-square)	B-weight	Standard Error	beta	t	df	p-level
General	.347	(.120)	.317	.064	.347	4.969	180	.0000
Within Non-repetition	.502	(.253)	.480	.084	.503	5.70	96	.0000
Within Repetition	.164	(.027)	.142	.094	.164	1.518	83	.133

Ancova: Summary of all Effects.
Design: 2 (Repetition vs Non-repetition of target message) x 2(Argument Quality) x 2 (Order of measurement)
Dependent variable: Attitudinal judgments towards target issue

	df	MS	F	p-level
Covariate	1	54.162	24.695	.000
Repetition vs Non-repetition	1	6.948	3.168	.077
Argument quality	1	13.356	6.089	.015
Order of measurement	1	.005	.002	.960
Repetition x Arg Quality	1	8.493	3.872	.050
Repetition x Order meas.	1	1.936	.883	.349
Arg quality x Order meas.	1	1.967	.897	.345
Repet. X Arg.Qual.x Order	1	2.143	.977	.324
Error	180	2.193		