

Effects of Mood on Evaluative Judgements: Influence of Reduced Processing Capacity and Mood Salience

Publisher: Psychology Press, part of the Taylor & Francis Group

Issue: Volume 12, Number 6 / November 1, 1998

Pages: 783 - 805

URL: <http://taylorandfrancis.metapress.com/link.asp?id=39wbvb7ckd882w9q>

DOI: 10.1080/026999398379439

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Schwarz and Clore (1983) proposed that the effects of mood on evaluative judgements are due to people's use of a "feeling heuristic". Results of the present study suggest that this heuristic is particularly likely to be used under conditions of reduced processing capacity, induced by time pressure and competing task demands, as both factors intensified the effects of mood on evaluative judgements. In addition, previous findings that increasing the salience of a judgement-irrelevant cause disrupts the effects of mood on evaluative judgements were replicated. All of these effects were, however, obtained only when mood was salient to the participants, suggesting that to be effective, mood must exceed a threshold of salience. Taken together, the findings further support the hypothesis that at least in some situations, the effects of moods on evaluative judgements are based on a controlled inference strategy, rather than on automatic priming effects.

INTRODUCTION

Positive and negative moods have been shown to have a variety of effects on cognitive processes. Particularly well established are the effects of mood on evaluative judgements, including satisfaction with consumer goods (Isen, Shalke, Clark, & Carp, 1978), satisfaction with life in general (e.g. Schwarz & Clore, 1983), evaluation of others (e.g. Berkowitz & Troccoli, 1990; Erber, 1991; Fiedler, Pampe, & Scherf, 1986), health-related cognitions (Salovey & Birnbaum, 1989), and evaluation of activities (Cunningham, 1988; for reviews see Clore, Schwarz, & Conway, 1994; Forgas, 1994, 1995; Isen, 1984; Morris, 1989; Schwarz, 1990).

A prominent explanation of these findings focuses on the effects of moods on the recall of valenced material from memory (e.g. Bower, 1991; Isen, 1984). This explanation rests on the following assumptions: (1) the evaluative judgements in question are based on an integration of recalled positive and negative features of the evaluated object; (2) individuals typically do not retrieve all potentially judgement-relevant information from memory, but base their judgement on a subset of this information that is most accessible (cf. Bodenhausen & Wyer, 1987; Sherman & Corty, 1984; Wyer & Srull, 1986); and (3) mood-congruent memory (e.g. Blaney, 1986; Morris, 1989) causes mood-congruent information to be over-represented in this subset. These assumptions entail that evaluations should be biased in a mood-congruent manner. Further enhancing this effect, information that comes to mind first, or that can

be easily retrieved, may be more heavily weighted in the judgement process (see e.g. Kahneman, Slovic, & Tversky, 1982). Finally, at least in the case of complex and extended social judgement processes, the increased accessibility of mood-congruent concepts and associations could bias the subsequent interpretation of the judgements through this route.

This ‘‘mood-congruent retrieval’’ or ‘‘mood-priming’’ explanation of the effect of mood on evaluative judgements has been questioned by Schwarz and Clore (1983; see also Clore et al., 1994; Schwarz, 1990, p. 529), who proposed an alternative explanation that ‘‘focuses on the informative function of affective states in controlled inference processes, rather than on the automatic process of mood-congruent retrieval’’.

More specifically, Schwarz and Clore proposed: (1) When making evaluative judgements, individuals often do not use presumably effortful analytic judgement strategies- such as recalling the various positive and negative attributes of the object and then forming a summary judgement- but rely on a simplifying judgement method called the ‘‘feeling heuristic’’: They base their judgements primarily on their perceived affective reactions to the object. That is, individuals ask themselves, in effect: ‘‘How do I feel about the object?’’ and base their evaluative judgement on the answer to this question. (2) Because moods, other than emotions, are global in character (e.g. Frijda, 1993; Morris, 1989)- that is, they are not directed at specific objects (e.g. Armon-Jones, 1991; Lormand, 1985; Oatley & Johnson-Laird, 1987) - people who are in a positive or negative mood may mistake their preexisting feeling at the time of judgement as an affective reaction to the judged object. In other words, they may misattribute their mood partly or wholly to the object. (3) As a consequence, their evaluative judgements are influenced in a mood-congruent manner.¹

During recent years, evidence has accumulated that favours this ‘‘feelingheuristic’’ explanation of the effect of mood on evaluative judgements, at least for situations in which people rely on judgemental heuristics rather than on more elaborate, extensive judgement strategies (cf. Forgas, 1994, 1995). Probably the most important supportive findings (see Clore et al., 1994 and Schwarz, 1990 for more detailed reviews) are the following two. First, it has been found that the effect of negative mood on evaluative judgements can be reduced or eliminated if the true- or a plausible alternative- cause of the mood (e.g. the weather) is made salient to the participants (Keltner, Locke, & Audrain, 1993; Schwarz & Clore, 1983; Schwarz, Servay, & Kumpf, 1985). Second, the effect of mood on judgements seems to be independent, to a large degree, of the specific content of the material used to induce the mood (Clore, Schwarz, & Kirsch, 1983, quoted in Schwarz, 1990; Johnson & Tversky, 1983). These findings are in accord with feelingheuristic theory, because according to this theory, the effect of affective states on evaluative judgements depends primarily on their informational value for judging the target; whereas the content of the material used to induce the affects should be irrelevant as long as it does not discredit that informational value. In contrast, according to the theory of mood-congruent

¹ It may be noted that this theory of the effects of mood on evaluative judgements shows a strong formal analogy to the theory of excitation transfer (Zillmann, 1978), which is itself a specialisation of Schachter's (1964) two-factor theory of emotions to the case of sequentially occurring states of arousal (Reisenzein 1983). According to excitation transfer theory, emotional reactions are intensified by misattributed residual physiological arousal stemming from a prior inducer (cf. e.g. Cantor, Zillmann, & Bryant, 1975; Reisenzein & Gatteringer, 1982). Although excitation transfer theory deals with the effects of *residual arousal* on *emotions*, whereas Schwarz's (1987) theory deals with the effects of *moods* on *evaluative judgement*, the two theories share the assumption that the predicted effects are mediated by casual attributions (or misattributions) of, respectively, arousal or mood.

retrieval, the key factor in mood effects on evaluative judgements is the content of the retrieved information, whereas the causal attribution of the mood should be irrelevant.

However, as pointed out by Forgas (1994, 1995), the two explanations of the effects of moods on evaluative judgements are not necessarily contradictory, because they may apply under different circumstances. Indeed, this assumption is a central tenet of an integrative model, the so-called ‘‘affect infusion model’’, proposed by this author. According to Forgas, the moodcongruent retrieval model applies in those situations where people engage in substantive and elaborate processing, whereas the feeling-heuristic model applies whenever subjects are not motivated or able to engage in extensive processing and therefore simplify the task by using the feeling heuristic. The experiment reported in this article is a further empirical test of the feeling heuristic explanation of the effects of moods on evaluative judgements under circumstances where people are likely to engage in heuristic processing. The study had three goals.

The first goal was to test a further prediction that has been derived from the feeling heuristic model but has not yet been empirically tested. Schwarz (1990) assumed that the use of the feeling heuristic is a controlled rather than an automatic process (in the sense of Shiffrin & Schneider, 1977; see also Bargh, 1994), and that one of the main reasons for using the feeling heuristic instead of an analytic judgement strategy is that doing so simplifies the judgement task. If so, one should expect that the feeling heuristic is increasingly relied on under conditions that limit the available central processing capacity and that, as a result, the effects of moods on evaluative judgements should be enhanced under such circumstances (Schwarz, 1990; an analogous prediction can be derived from the affect infusion model for heuristic processing situations; see Forgas, 1995).

Note that this is a strongly *discriminative* prediction of the feelingheuristic model; that is, one that sets it off clearly from the moodcongruent retrieval model (for a given type of processing situation). The reason is that, according to the latter model, mood effects should be most pronounced when judgements are made in an elaborated, extensive manner that require a high amount of processing resources, because of the greater amount of mood-congruent material that is accessed (cf. Forgas, 1995). In the present study, this prediction was tested by using two standard methods of reducing available processing capacity: time pressure and a competing task. It was expected that the effects of moods on evaluative judgements would be *enhanced* under these circumstances.

The second goal of the present study was to further clarify the role of *salience of mood* in effects of mood on evaluative judgements (moods are the more salient, the more they are at the focus of a person’s attention or awareness). Research on the effects of cue salience in other domains has demonstrated that salient cues are particularly influential in determining judgements (e.g. Sherman & Cortsy, 1984). Extrapolating from these findings, Schwarz (1987, 1990) proposed that salience of mood also plays an important role in mood effects on evaluative judgements. Specifically, Schwarz suggested that, the more salient mood is relative to other cues potentially relevant to the judgements in question, the more heavily weighted is the information that it provides in the judgement process and therefore, the more pronounced is its judgemental effect. In fact, according to Schwarz (e.g. 1987, p. 91) other sources of information may even be entirely ignored in the presence of a salient mood. Some, albeit rather indirect, support for these suggestions was provided by Strack, Schwarz, and Gschneidinger (1985), who found that participants relied more strongly on their mood state in evaluating their current life satisfaction if they were asked to report a past positive or negative life event in an emotionally

involving style (a procedure that presumably made their mood salient to them). On the other hand, results of a more recent study by Keltner et al. (1993, study 4) suggest that high salience of mood may under certain conditions *reduce* rather than enhance mood's influence on evaluative judgements.

In one experimental condition of this study, the participants were put into a negative mood and were then asked to reflect on their current emotions and their causes, and to label the emotions. In this condition, the effect of negative mood on evaluative judgements was found to be reduced (relative to a control condition) to the same degree as in two other conditions, in which the participants were induced to attribute their moods to an alternative, judgement-irrelevant cause. The interpretation of these findings is, however, ambiguous, because in the 'salient mood' condition of the Keltner et al. study, not only the mood but also its *cause* was made salient. That is, as mentioned, the participants were not only asked to label their current emotions, but also to reflect on their causes. It may be safely assumed that most participants came to regard the just-completed mood induction procedure as an important cause of their current mood. The elimination of mood effects in these experimental conditions could therefore again have been due to the causal attribution of the mood, as was presumably the case in the explicit attribution conditions and in the earlier studies by Schwarz and Clore (1983) and Schwarz et al. (1985).

To disentangle the effects of mood salience and mood attribution, in the present study an attempt was made to manipulate these two factors independently of each other. Unravelling these effects is important because, if it were found that salience of mood is alone sufficient for eliminating mood's influence on judgements, this could provide for an alternative explanation of the finding that increasing the salience of an alternative cause eliminates the effects of moods on evaluative judgements (e.g. Schwarz & Clore, 1983; Schwarz et al., 1985). One need only assume that in these experiments, making people aware of a plausible cause of their mood also made them aware of their negative mood itself. According to this alternative explanation, then, the active ingredient of the attributional manipulations used in previous experiments was their attention-directing effect, rather than the causal information that they provided (see also Morris, 1989, for a similar view).

Finally, and conjointly with the second goal of the study, our third aim was to replicate and clarify one of the central findings advanced by Schwarz (1990) in support of the feeling-heuristic model: Namely, that making an alternative cause of the mood salient to participants reduces or eliminates the effects of moods on evaluative judgements (Schwarz & Clore, 1983; Schwarz et al., 1985; see also Keltner et al., 1993).

In sum, the following main hypotheses were tested (they were assumed to hold at least for evaluative judgements of the type examined in the present experiment- judgements of life satisfaction- that presumably do not elicit an extensive processing style):

1. The effect of mood on evaluative judgements is enhanced under conditions of time pressure and competing task demands.
2. The effect of mood on evaluative judgements is enhanced if mood is made salient to the participants.
3. The effect of mood on evaluative judgements is reduced or eliminated if a judgement-irrelevant cause of the mood (here: the mood-induction procedure) is made salient to the participants.

METHOD

Participants

Subjects were 80 (50 female, mean age 26.4) introductory psychology students at the Free University Berlin, who participated in partial fulfilment of their study requirements. Data from three participants were lost because of equipment malfunction, reducing the final sample size to 77.

Design

Although the described hypotheses called for specific comparison of particular experimental conditions (see Results for details), for reasons of subject economy, and because we wanted to explore possible additional interactions between the factors of interest, a five-factorial split-plot design consisting of three between-subjects factors and two within-subjects factors was used. All factors had two levels. Between-subjects factors were *mood* (positive vs. negative), *mood attribution* (influenced by making the mood induction procedure, a judgement-irrelevant mood cause, salient vs. nonsalient), and *salience of mood* (high vs. low). Within-subjects factors were *time pressure* (present vs. absent) and *secondary task* (present vs. absent). The subjects were randomly assigned to the experimental treatments, with 10 or 9 (due to the missing data) subjects in each cell. The main dependent variable was the mean of a set of evaluative judgements related to satisfaction with different life areas. We selected these judgements because they *can*, on the one hand, be made in an analytical, elaborate fashion (by retrieving from memory, and integrating, relevant information about the respective life areas that were to be evaluated), but are at the same time likely candidates for simplification by a feeling heuristic, either spontaneously or under additional processing demands (cf. Schwarz, 1987). Altogether, 48 satisfaction items were used. They were selected from a pool of 100 such items modelled after similar ones used by Borg (1987) as those items that, according to the results of pretesting, correlated relatively strongly with simultaneously measured mood.² In addition, for exploratory purpose, the latencies of the judgements were measured (see Results for details).

Procedure

The participants were tested individually. They were informed that they would participate in two independent experiments that for economic reasons were conducted in tandem. The first experiment allegedly concerned the mental representation of autobiographical memories. In truth, it served to induce positive versus negative mood (Factor 1), as well as to manipulate the perceived cause of the mood (Factor 2). *Mood* was induced through a combination of two methods found to be effective in previous investigations: Recalling personal memories of positive versus negative events (e.g. Abele, 1990; Schwarz & Clore, 1983), and listening to happy versus sad music (e.g. Kenealy, 1988; Parrott & Sabini, 1990). It was thought that the combination of both methods would be particularly effective, because Spies, Hesse, Gerrards-Hesse, and Ueffing (1991) found this to be the case for the combination of music with the reading of self-referenced statements (i.e. the technique developed by Velten, 1968). The participants were asked to revisualise, as concretely as possible, a very

² A copy of the satisfaction items is available from the first author on request.

positive or a very negative life experience and to write it down while at the same time listening to happy versus sad music (care was taken to assure that the participants were convinced of the anonymity of their reports).

Attribution of mood (Factor 2) was manipulated as part of the explanation given for the simultaneous music presentation. In the *mood misattribution (or nonsalient irrelevant cause) condition* the participants were only told that the experimenter was interested in the effects of different kinds of music on autobiographical memories. It was expected that in this condition, participants would misattribute part of their mood to their considering the various life areas that were presented to them as part of the evaluative judgement task. In the *control condition (or salient irrelevant cause condition)*, the participants were informed that happy versus sad music has been found to put people into a positive versus negative mood, which in turn would help them to recall positive versus negative life experiences. It was expected that making the true but judgement-irrelevant mood cause salient would prevent mood misattribution from occurring (cf. Schwarz & Clore, 1983). Post-experimental interviews indicated that these cover stories were accepted by all participants; also, all but three subjects suspected no relation between the ‘‘two experiments’’, and the three who did had erroneous hypotheses. The music consisted of a selection of pieces developed and tested for the purpose of mood induction by Pignatiello, Camp, and Rasa (1986). The mood-induction procedure took about 15 minutes.

Immediately after the mood induction, the third between-subjects factor (*mood salience*) was manipulated. Subjects in the *high mood salience* condition were asked to complete a mood questionnaire consisting of scales for happiness, sadness/depression, anxiety, and anger (seven items each). This method of increasing mood salience, which was previously used and found to be effective by Rothkopf and Blaney (1991), has face validity: Asking someone to introspect and to report on his/her mood seems to be the most direct possible method of getting the person to focus attention on his/her current mood and to make it an object of thought; hence this method makes the mood salient almost by definition. At the same time, the mood scale also served as a manipulation check for the effectiveness of the mood-induction procedure. Subjects in the *low mood salience condition* did not receive the mood questionnaire.

Immediately afterward, the alleged ‘‘second’’ experiment was conducted. It was presented as a study of the effects of different answer conditions on judgements related to life satisfaction. Participants were seated in front of a personal computer. After three practice items, the 48 experimental satisfaction items (e.g. ‘‘How satisfied are you with your social relationships?’’) were individually presented on the computer screen. Below each item, a 6-point rating scale anchored in the labels *not at all satisfied* (1), to *very satisfied* (6) was shown. The participants had to answer the items by entering a number from 1 to 6. To control possible effects of individual differences in reading speed, as well as differences in item length, all items were presented in slow reading speed (60msec per letter). The subjects were also informed that additional instructions would be presented on the computer screen during the experiment, but to prevent possible effects of prior knowledge of the task-demand conditions on the results, these instructions were not specified further.

Time pressure (Factor 4) and *competing task* (Factor 5) were manipulated within subjects by presenting 12 of the 48 items each under the four possible combinations of these two factors. The resulting four experimental conditions were presented in a fixed order that reflected increased taxing of cognitive resources. That is, the first 12 items were presented under the *notime pressure/ no competing task* condition. They were followed by 12 more items that were presented under conditions of a *competing task (only)*.

Following Logan (1979), an instruction appeared on the screen asking participants to memorise the subsequently appearing number. A 5-digit number was then presented for 5 seconds, followed by the 12 judgement items; subsequently, the number was to be recalled, but no performance feedback was given. Prior to the third batch of 12 items, time pressure was manipulated (*time pressure only conditions*). The participants were: (a) instructed to answer as quickly as possible from now on; and (b) a maximum response time window was defined individually for each subject. The time window was defined as 80% of each subject's average response time on the first 24 items, but in no case less than 2sec. One second before the maximum response time was reached, the participants were warned both optically and acoustically; if no response occurred within the response window, a second tone was sounded, a message appeared on the screen that the maximum response time had been exceeded and the next item was presented. The final 12 satisfaction items were to be answered under conditions of both time pressure and secondary task conditions (*time pressure plus competing task condition*). Which of the 48 items appeared under the four experimental conditions was determined separately for each subject by randomisation.

The described order of task demands was chosen to allow us to clearly distinguish the effects of cognitive load from any potential effects of changes in mood intensity across the experiment. Because cognitive load increased during the experiments, the feeling heuristic hypothesis predicts a parallel *increase* of mood effects on evaluative judgements in the course of the experiment. In contrast, mood intensity, and thus any effects of intensity on evaluative judgements, should if anything *decrease* in the course of the experiment. The present test of the cognitive load hypothesis is thus conservative. However, note that the total judgement task lasted only from 8 to 10 minutes and was thus well within the duration of mood effects usually assumed in previous research (see e.g. Isen, 1984).

At the end of the experiment, the participants were tested for suspicion and were carefully debriefed, and the notes of their autobiographical memories were returned to them.

RESULTS

Effectiveness of Mood Induction

The effectiveness of the mood manipulation was checked by comparing the 20 participants in the positive mood condition who had completed the mood questionnaire as part of the manipulation of mood salience with the 20 participants in the corresponding negative mood condition. The four scales, of the mood questionnaire (happiness, sadness/depression, anxiety, and anger) had internal consistencies (Cronbach's alpha) ranging from .90 (anxiety) to .96 (positive and negative mood). As expected, subjects in the positive mood condition were significantly happier ($M = 5.35$) than those in the negative mood condition [$M = 2.63$, $t(37) = 4.0$, $P < .001$ (onetailed)], corresponding to an effect size of $d = 1.35$; whereas subjects in the negative mood condition were significantly sadder ($M = 3.61$) than those in positive mood condition [$M = 1.46$, $t(37) = 3.43$, $P < .001$ (one-tailed)], $d = 1.13$.³ There were no significant differences between the two mood groups

³ Because we manipulated mood salience by means of a mood questionnaire, it is clear that we could not use the questionnaire as a manipulation check in the low salience group. Nonetheless, one can be fairly certain that the mood manipulation was also effective in the latter group: Because the mood induction procedure was the same in both mood salience groups and subjects were randomly assigned to the groups, there are no *systematic* differences in the empirical distributions of subjects' variables between groups (i.e. the two groups can be regarded as samples from the same population). Consequently, any differences between the

with regard to anxiety [$F(1,37) < 1$], and anger [$F(1,37) = 1.8, P > .18$]. Hence, the mood induction was not only *effective*, but also *specific*, inasmuch as it did not affect anger and fear. In addition, there was no significant interaction between mood condition and causal information on the happiness and sadness/depression subscales [$F_s(1,35) < 1$], indicating that the different instructions concerning the reason for playing the music did not affect the effectiveness of the mood-induction procedure. Therefore, any effects of mood attribution cannot be explained by differences in mood (cf. Schwarz & Clore, 1983).

The hypotheses concerning mood effects on evaluative judgements formulated in the introduction were tested by means of focused contrasts (i.e. comparisons of means or combinations of means) within the context of the five-factorial design (for details see e.g. Rosenthal & Rosnow, 1985; Rosnow & Rosenthal, 1989). This procedure, rather than the more standard overall analysis of variance, was chosen for two main reasons. First, in contrast to ANOVA, it allows one to test *directed* main and interaction effects (Horton, 1978), which have a higher power than their undirected ANOVA counterparts. Accordingly, all directional a-priori hypotheses could be tested using one-tailed tests. Second, the use of a-priori contrasts reduces the number of independent statistical tests, and thus the danger of type I errors. In the present case, the standard approach would have meant a five-factorial ANOVA with 31 independent statistical tests, which makes the possibility of type I errors a serious problem. In sum, although being slightly nonconventional, the use of focused contrasts provided for greater statistical power (by allowing one-sided tests), and reduced the probability of type I errors (by restricting the number of statistical tests to those being of theoretical importance). (In addition, this approach also allows to match precisely the statistical hypotheses tested to the theoretical predictions.) However, in order to not overlook additional effects for which no explicit hypotheses were stated, we *did* additionally conduct an *exploratory* fivefactorial ANOVA.

Replication of Previous Findings

We expected, in accord with previous findings: (a) that mood would influence the life-satisfaction judgements, that is, they would be more positive under positive than negative mood; and (b) that this effect would be reduced or eliminated if the judgement-irrelevant cause of the mood (the mood-induction procedure) is made salient to the participants (this is hypothesis 3 stated in the Introduction; cf. Schwarz & Clore, 1983 ; Schwarz et al., 1985). Expressed in terms of statistical effects, this hypothesis amounts to an interaction between mood (positive/negative) and mood attribution (misattribution vs. no misattribution, or low vs. high salience of the mood cause), such that the difference between positive and negative mood groups is less pronounced if the mood cause is made salient to the participants.

We thought initially that the conditions best comparable to those used

groups with regard to the effects of the mood-induction procedure must be due to the random assignment itself ('errors of randomisation', cf. Siemer, 1997). Specifically, lack of effectiveness of the mood induction in the low salience condition must have been due to the chance allocation of a disproportionately high number of subjects to this condition who were insensitive to the manipulation. Based on conventional power analysis (Cohen, 1988), the likelihood for this to happen is equal to b , the probability of a non significant difference in the low mood salience group given the obtained effect size in the high mood salience group. As noted, this effect size (for the happy mood scale) is $d = 1.35$ in the sample. Using this sample statistic as an estimate of the population effect size, the probability of obtaining a *significant* difference in a sample of $N = 40$, that is the power ($1 - \beta$), is .96 for an α of .01 (cf. Faul & Erdfelder, 1992 for computational details). Apart from this consideration, mood also had a significant effect on processing latency in the low salience group.

in previous studies would be the low mood salience conditions; therefore, the two hypotheses were first tested for the latter conditions. Unexpectedly, the predictions were not confirmed for these conditions (cf. Fig 1) ; Evaluations under positive mood were not significantly more positive ($M = 3.56$) than under negative mood [$M = 3.6$, $t(69) < 1$], and the expected interaction between mood and salience of the cause was not significant [$t(969) < 1$].⁴ Support for the predictions *was* obtained, however, in the high mood salience conditions: In these conditions, the judgements were significantly more positive in the positive mood condition ($M = 3.79$) than in the negative mood condition [$M = 3.31$, $t(69) = 3.04$, $P < .001$ (one-tailed), $d = 1.12$]; and there was a marginally significant interaction between mood and salience of the cause [$t(35) = 1.59$, $P < .07$ (one-tailed), $d = .54$].⁵ As shown in Fig 1, this interaction had the predicted form, that is, there was a smaller difference between positive and negative mood in the high salient cause condition ($M = 0.27$) than in the low salient cause condition ($M = 0.68$). Additional planned comparisons within the two mood conditions showed a significant difference between the low and high salient cause for the negative mood group [$M_s = 3.10$ vs. 3.52 , $t(69) = 2.13$, $P < .05$ (onetailed), $d = 1.07$], but not for the positive mood group [$t(1,69) < 1$]. If one assumes that both the positive and the negative mood inductions were effective in changing mood away (in opposite directions) from the preinduction baseline (as is suggested, e.g. by the findings of Abele, 1990), the form of the obtained interaction (Fig. 1) could be taken to indicate that a salient cause eliminated only the effects of negative but not of positive mood. Although in the absence of a no-mood-induction control group, this inference must remain speculative, it would be in accord with previous findings (Schwarz & Clore, 1983; Schwarz et al., 1985).⁶ As already stated, the obtained results were in one respect counter to expectations, namely, inasmuch as we expected to obtain them preferably in the *low* mood salience conditions, because these conditions seemed to be best comparable to the conditions prevailing in previous studies in which mood effects on evaluative judgements have been obtained. This expectation was based on the fact that an *explicit* manipulation of mood salience was hardly if ever used in these studies. However, as detailed in the Discussion, a re-examination of the previous studies suggests that in most, mood was probably salient to the participants. Therefore, it is the *high* mood salience conditions of the present experiment that correspond most closely to these earlier studies. In any case, because standard mood effects on evaluative judgements were obtained only in the high salience mood conditions, the predicted moderating influence on this effect of time pressure and competing task demands can also be expected for this condition only. Accordingly, the processing load hypothesis was tested separately for the high and low mood salience conditions, with the expectation that it would be confirmed at least

⁴ As mentioned, this *t*-test formally corresponds to the ANOVA test of the interaction between mood (positive/negative) and mood attribution (low/high salience of mood cause); however, in contrast to the interaction *F*-test, the *t*-test is directional (see Rosenthal & Rosnow, 1985, for the computational details). An analogous comment pertains to the other "interaction" *t*-tests reported later

⁵ According to Cohen (1988), $d = .20$ is considered to be a *small* effect; $d = .50$ a *medium* effect; and $d = .80$ a *large* effect in experimental contexts.

⁶ According to Schwarz (1987, 1990), this asymmetry of the effects of causal information is due to the fact that positive affective states are viewed as requiring less explanation than negative ones (see also Liu, Karasawa, & Weiner, 1992; Weiner, 1985). It is assumed that, if no explanation for one's feelings is sought to begin with, directing attention to a potential cause of the feelings is unlikely to show any effect.

for the high mood salience conditions.

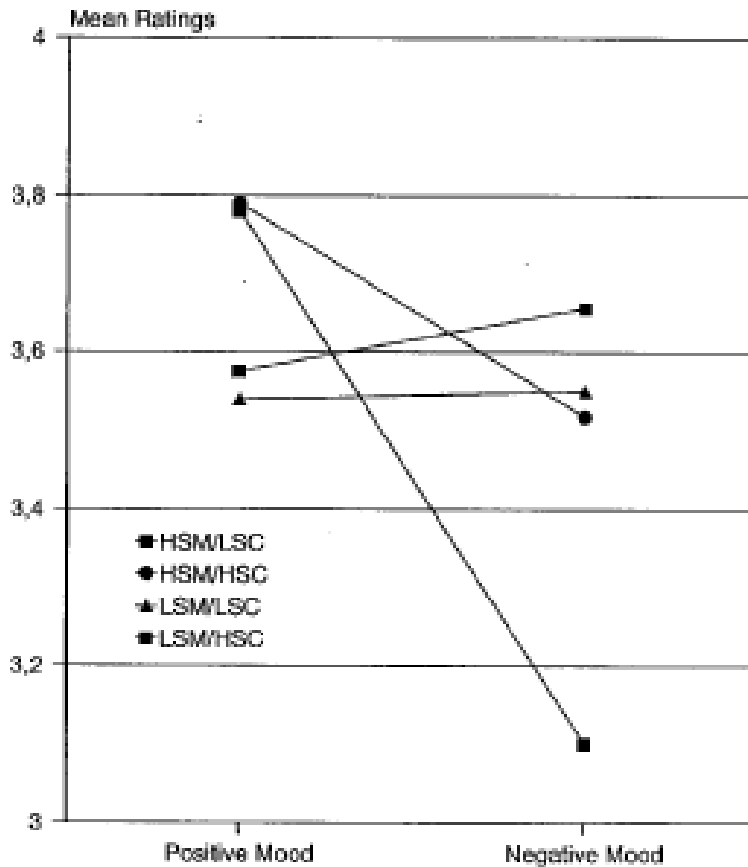


FIG. 1. Satisfaction judgements under conditions of low salience of mood (LSM), high salience of mood (HSM), low salience of mood cause (LSC), and high salience of mood cause (HSC).

Effects of Reduced Processing Capacity

According to hypothesis 1 (see the Introduction), the effect of mood on evaluative judgements is enhanced under conditions of reduced processing capacity. In terms of statistical effects, this hypothesis amounts to an interaction between mood and processing load, such that the difference between positive and negative mood is higher given time pressure or secondary task. For the high mood salience condition, this prediction was confirmed, both for time pressure [$t(69) = 1.92$, $P < .05$ (one-tailed), $d = .76$], and- although only marginally significant- for secondary task [$t(69) = 1.59$, $P < .06$ (one-tailed), $d = .44$]. As shown in Fig 2, the mean differences between evaluative judgements in the two mood conditions were higher given time pressure ($M = .31$) than given no time pressure ($M = .14$), and

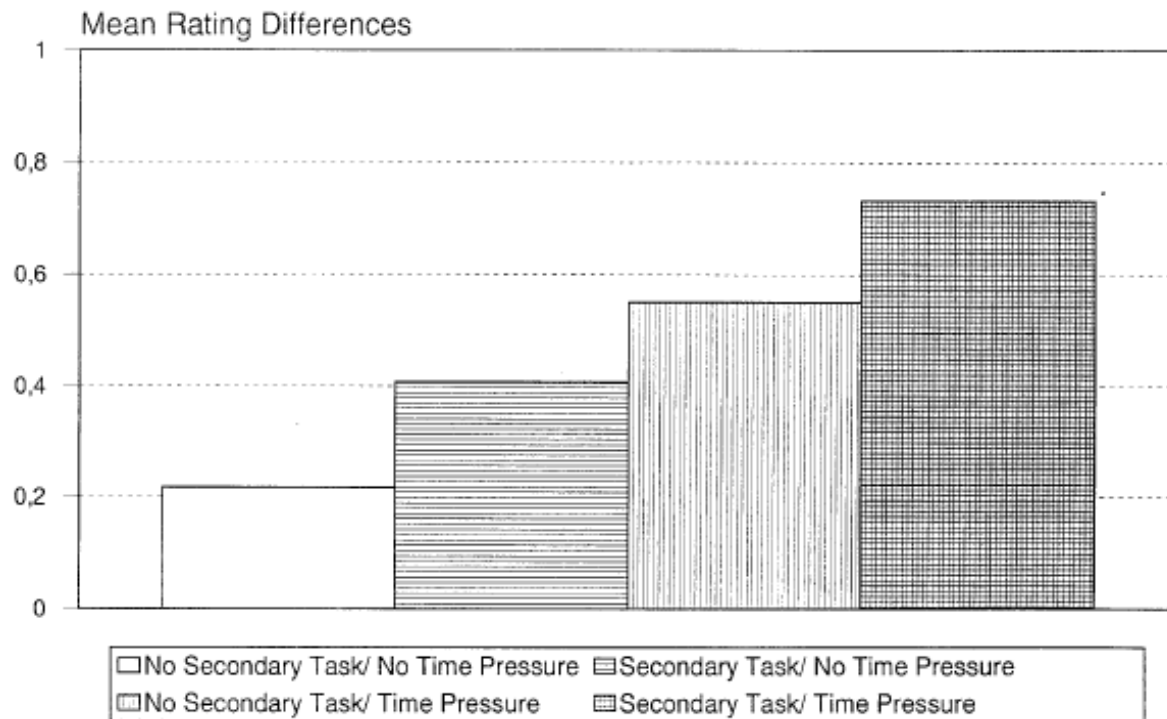


FIG. 2 Effects of secondary task demand and time pressure on satisfaction-judgement differences between happy and sad mood group under conditions of high salience of mood.

higher given a secondary task ($M = .28$) than given no secondary task ($M = .18$). One might have expected these effects to be more pronounced in the nonsalient cause conditions than in the salient cause conditions, and the results pointed indeed in this direction; however, the relevant statistical comparisons were not significant. This finding dovetails with the hypothesis that a salient cause disrupted mood effects only partly (in the negative mood condition).

No significant effects were obtained for the low mood salience conditions (both $P > .25$).

As noted before, the described order of task demands was used to rule out the possibility that the obtained effects were caused by a decrease of mood intensity across the experiment. To check whether such changes had indeed occurred, the first half of the satisfaction items within each processing condition was compared with the second half in a 2 (first/second) by 2 (positive/negative mood) ANOVA. A decrease of mood intensity over time would be reflected in an interaction between these two factors to the effect that the differences between positive and negative mood are smaller for the second half of the items. No such effect was found: Both the interaction and the main effect of items were nonsignificant, F s < 1.

Effects of Mood Salience

The results obtained for mood salience were already described implicitly in the foregoing paragraphs. To summarise: Although the overall directed contrast corresponding to the interaction between mood and mood salience was significant [$t(69) = 2.59$, $P < .01$ (one-tailed), $d = .62$], indicating that mood had stronger effects on evaluative judgements under conditions of high mood salience, single contrasts revealed, as mentioned, that the findings of previous studies were replicated only for the high mood salience

condition. In addition, the predicted boosting effect of reduced processing capacity was also obtained only for the high mood salience condition. Although the *complete* lack of effects in the low mood salience condition was unexpected, the obtained findings are in accord with hypothesis 2 (see the Introduction), stating that the effects of mood would be enhanced under conditions of high mood salience.

To round off the statistical analysis of the satisfaction judgements, they were subjected to a split-plot ANOVA including all five experimental factors with the aim of exploring other potential effects that had not been predicted. This analysis revealed no effects that have not already been mentioned, with the exception of a marginally ($P < .08$) fourfactorial interaction between mood salience, mood cause, time pressure, and secondary task that we refrain from interpreting further.

Analysis of Response Latencies

As mentioned, Schwarz and Clore (1983; Schwarz, 1990) proposed that one of the main reasons for using the feeling heuristic rather than an analytic judgement strategy is that the feeling heuristic simplifies the judgement task. If so, it seems not unreasonable to expect that, other factors constant, participants who use the feeling heuristic need less time to make evaluative judgements than those who do not. The results reported earlier could be taken to suggest that the feeling heuristic was used more under conditions of high mood salience; if so, response times should be shorter under these conditions. However, this hypothesis was not supported by the data: There was no significant reaction time (RT) difference between the high and low mood salience condition [$t(69) < 1$]. An additional, exploratory ANOVA revealed (apart from a trivial effect of time pressure) a significant main effect of mood (positive vs. negative) on response latency [$F(1, 69) = 5.24, P < .05$], qualified by a significant interaction between mood and mood salience [$F(1, 69) = 8.62, P < .01$]. Follow-up tests showed that participants in the low mood salience condition responded significantly more quickly when in positive than in negative mood [$F(1, 69) = 13.74, P < .001$], whereas no difference in response time was obtained between positive and negative mood for participants in the high mood salience condition.

Based on the results of previous studies (e.g. Fiedler, 1988 ; Schwarz, Bless, & Bohner, 1991), a possible, although speculative explanation of these findings could be that in the low mood salience conditions, participants in a bad mood needed more time to make the judgements because they were more ‘analytic’ and careful than participants in a good mood. Alternatively, participants in a bad mood may have been more preoccupied with their feelings and as a result may have had available- or may have been willing to devote- less processing capacity for the judgement task, which had to be compensated by increased processing time (cf. Klauer, Siemer, & Stöber, 1991). Under conditions of high mood salience, in contrast, both positive and negative participants used the simplifying feeling heuristic, which obliterated any processing time differences that existed between positive and negative moods.⁷

⁷ Note that we did not select the judgement task specifically to examine the impact of mood on processing capacity, which was not a major concern of this study. There was no *interaction* of mood effects on latency with capacity effects on mood-congruency.

DISCUSSION

Concentrating first on the high mood salience condition, we found, in accord with predictions: (a) that mood affected evaluative judgement and that this effect was disrupted by making the judgement-irrelevant cause of the mood salient to the participants; and (b) that the effects of mood were enhanced under conditions of time pressure and competing task demands. Hence, a crucial piece of evidence presented by Schwarz (1987, 1990) in favour of the 'feeling-heuristic' model of the effects of moods on evaluative judgement was replicated, and additional predictions derived from that model were confirmed.

It may be noted that the findings concerning the effects of additional processing demands and mood attribution are not only difficult to explain by: (1) the mood-priming hypothesis described in the Introduction. The total pattern of results also rules out potential alternative explanations of (parts of) the obtained effects; such as (2) that salience of mood (manipulated by presenting a mood questionnaire) exerted its effects exclusively on the basis of a semantic-priming effect, that is, through making the *concept* of the respective mood(s) more available (cf. e.g. Clore et al., 1994 ; Wyer & Srull, 1989) ; or (3) that the processing load effects, too, were due to mood misattribution.⁸

It should be emphasized, however, that the enhancement effects of additional demands on mood-congruency were obtained in a situation that encouraged the use of judgements heuristics. The findings, therefore, do not necessarily extend to situations that encourage the use of substantive, elaborate judgement strategies (as, e.g. demanded by complex tasks). In fact, results by Forgas (1992) suggest that subjects in such circumstances show greater mood-congruency the more elaborate the judgements are. These results lead us to suspect that in these circumstances, a reduction of processing capacity will lead to effects contrary to those found in the present study. In fact, this prediction seems to rather directly follow from Forgas (1994, 1995) integrative affect-infusion model of mood effects. As mentioned, Forgas assumes that, whether mood-congruency effects on evaluative judgements are based on a mood-congruent priming mechanism or on a feeling heuristic depends crucially on whether the judgement process is substantive and elaborate versus simple and heuristics-based. Consequently, the effects of a reduction of processing capacity on moodcongruency of evaluative judgement should also depend on the kinds of judgements at issue. In situations where evaluative judgements are based on elaborate, extended reasoning processes and mood-congruency is due to (the greater scope of) primed material incorporated in the judgement, an increase in processing load should *reduce* the mood-congruency effect because it interferes with the judgement process. In contrast, in cases where subjects tend to process material in a heuristic manner to begin with, as in the present experiment, an increase in processing load should further increase reliance on the feeling heuristic, and therefore the moodcongruency effect should be *enhanced*. If this reasoning is accepted, the affect infusion model can handle both our present findings and those of Forgas (1992).

However, as said, the effects of reduced processing capacity on the moodcongruency effect were found only under conditions of high mood salience:

Only under these conditions were the results of previous studies replicated,

⁸ According to this hypothesis, the mood effects on evaluative judgements increased over time because, as time passed, the participants attributed their mood increasingly less to the prior induction. This suggestion is incompatible with the obtained effect of mood attribution and the lack of a decrease of this effect across time.

and the predictions concerning the effects of increased processing load confirmed. Although this pattern of results attests to the effectiveness of the mood salience manipulation, and although the enhancement of mood effects on judgements implied by this result was predicted and is in line with the feeling heuristic model, the total absence of effects in the low mood salience conditions was unexpected and needs further discussion. The simplest explanation would be that the enhancement of mood *salience* also increased its *intensity*. Manipulation of attentional focus has been found in previous studies to intensify both positive and negative mood (e.g. Scheier & Carver, 1977), and the experience of pain (Arntz, Dressen, & Meckelbach, 1991). However, this explanation presupposes that the mood induction used in the present study was so weak that, without the additional, enhancing effect of the salience manipulation, it remained ineffective. This seems to be unlikely, given the strong effects of the mood induction on the mood scale documented for the high mood salience conditions.

An alternative, and in our view more plausible explanation is that mood has an effect on evaluative judgements only if it exceeds a certain minimum value, or threshold, of salience; and that in the high mood salience conditions of the present study, as well as in previous studies in which mood effects were found, mood exceeded this threshold, whereas it remained below the threshold in the low salience condition. This hypothesis would certainly be in accord with the feeling-heuristic model, because the feeling heuristic is assumed to be a controlled rather than an automatic process; therefore, a minimum degree of attention to one's mood seems to be required for mood to have an effect on judgements. Recall that, according to the feeling-heuristic model, moods serve as information for making evaluative judgements, information that is in principle processed in the same way as is any other piece of information (Schwarz, 1990); specifically, information that is not heeded should have no effect. Nonetheless, the question remains why mood was not sufficiently salient in the low salience conditions of the present experiment to be taken into consideration in the judgement process. With hindsight, the most plausible explanation for this is in our view that, in contrast to most previous studies of a comparable nature, the details of our experimental procedure were such that, in the low mood salience conditions, they strongly diverted the participants' attention away from the previously induced mood. Recall that the mood induction and the ensuing evaluative judgement task were presented as parts of two entirely different and unconnected experiments; during the 'two studies', the participants were seated at different locations in the experimental room; and the computerised assessment of the evaluative judgement appears to have been a highly attention-attracting. A reexamination of previous studies in which mood effects on evaluative judgements were obtained suggests that in these studies, the participants' attention was most likely less strongly diverted from the previously induced moods. In fact, in some of these studies, the participants' attention seems (inadvertently) to have been directed at their mood. Thus, in some studies, participants were asked to complete a mood questionnaire as a manipulation check prior to making the evaluative judgements (e.g. Levine, Wyer, & Schwarz, 1994), and in other studies (e.g. Borg, 1987; Fiedler et al., 1986; Kavanagh & Bower, 1985; MacLeod & Campbell, 1992), the participants were explicitly instructed to try to induce in themselves a particular mood. Additional support for the hypothesis that mood must exceed a certain threshold of salience to be effective comes from studies by Parrott and Sabini (1990) and Rothkopf and Blaney (1991) on the effects of mood on memory for valenced materials. Parrott and Sabini (1990) found moodcongruent memory effects only if the participants themselves attempted to

induce the mood and were aware of the relevance of mood to the study (if these conditions were not met, mood-*incongruent* memory effects were obtained). In line with our reasoning, this could be attributed to increased mood salience in the former condition, particularly because the participants in these studies were also asked to complete a mood questionnaire after the mood induction. Rothkopf and Blaney (1991) found increased mood congruency of autobiographical memories of depressed people if the participants completed Beck's Depression Inventory prior to the recall of memories. For male participants- who were assumed to be characterised by a lower degree of chronic self-attention to their feelings than females- the prior completion of the depression inventory was even a necessary condition for obtaining a mood-congruency effect.

Whatever the exact reasons for the lack of effects in the low mood salience conditions, the present results indicate that the *salience of mood* and *mood attribution* need to be distinguished not only conceptually, but also in terms of their effects. Specifically, the obtained results speak against the possibility, raised in the Introduction, that increasing the salience of mood might be sufficient to eliminate mood effects on evaluative judgements, and that this attentional effect might have been the active ingredient of previous misattribution (e.g. Schwarz & Clore, 1983). On the contrary, the present findings suggest that salience of mood may be a necessary precondition for both the standard mood and the misattribution effects to occur.

Nonetheless, a potential limiting condition of the effects of mood salience must be noted. Namely, if people's attention is directed toward their moods in such a manner that they are also encouraged to reflect about the causes of their mood, then the net result could be a reduction or elimination of mood effects. The reason is that in this way, an extraneous mood cause (e.g. the mood-induction procedure) could spontaneously become salient and thus could prevent mood misattribution from occurring. Incidentally, this was precisely the reason why Strack et al. (1985) refrained from asking subjects to complete a mood questionnaire (as a manipulation check) prior to the evaluative judgements. This suggestion would also be in accord with the results of previous studies that support an analogous effect of increased salience of residual arousal on emotions (e.g. Cantor et al., 1975; Reisenzein & Gatteringer, 1982). Although this possibility was obviously not realised in the present experiment, an important goal of future studies should be to determine in more detail the conditions under which increasing the salience of moods results in an intensification versus a reduction of the effects of moods on evaluative judgements. For the time being, however, it may be concluded that the findings of the present study lend further support to the suggestion that the effects of moods on evaluative judgements are not necessarily 'automatic', inevitable effects, but can be based on (Schwarz, 1990, p. 539): 'highly inferential strategies, which may result in augmentation and discounting effects as described by the most 'reasoned' models in socialcognitive research, although these inferential steps may not necessarily be accessible to introspection'.

Manuscript received 7 March 1997

Revised manuscript received 10 February 1998

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