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Abstract

Research indicates that affect influences whether people focus on categorical or behavioral information during impression formation. One explanation is that affect confers its value on whatever cognitive inclinations are most accessible in a given situation. Three studies tested this malleable mood effects hypothesis, predicting that happy moods should maintain and unhappy moods should inhibit situationally dominant thinking styles. Participants completed an impression formation task that included categorical and behavioral information. Consistent with the proposed hypothesis, no fixed relation between mood and processing emerged. Whether happy moods led to judgments reflecting category-level or behavior-level information depended on whether participants were led to focus on their immediate psychological state (i.e., current affective experience; Studies 1 and 2) or physical environment (i.e., an unexpected odor; Study 3). Consistent with research on socially situated cognition, these results demonstrate that the *same* affective state can trigger entirely different thinking styles depending on the context.

Keywords

mood, affect and cognition, person perception, impression formation

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People think differently when they are happy than when they are sad (see Clore & Hunsinger, 2007; Isbell & Lair, in press; Schwarz & Clore, 2007, for reviews). The critical difference lies not in the content but in the style of their thought. People in happy moods seem to focus on the forest (i.e., category information), whereas those in sad moods focus on the trees (i.e., the details; e.g., Gasper & Clore, 2002). Evidence of this tendency is ubiquitous. Compared to individuals in sad (or neutral) moods, those in happy moods rely on stereotypes to a greater extent during impression formation (Bless, 2000; Bodenhausen, Kramer, & Susser, 1994; Isbell, 2004), actively select global traits over behaviors when forming impressions of others (Isbell, Burns, & Haar, 2005), rely on scripts (Bless et al., 1996), are less influenced by argument strength in persuasion tasks (e.g., Bless, Bohner, Schwarz, & Strack, 1990; Schwarz, Bless, & Bohner, 1991), create and use categories more flexibly (Isen & Daubman, 1984; Isen, Daubman, & Nowicki, 1987; Murray, Sujan, Hirt, & Sujan, 1990), and describe behaviors, events, and themselves in more abstract language (Beukeboom & Semin, 2005, 2006; Isbell, McCabe, Burns, & Lair, 2011). Happy moods also

increase the likelihood of the fundamental attribution error (Forgas, 1998), an error that results when individuals fail to correct their global dispositional judgments for situational details.

Over the years, various explanations have been proposed for the link between affect and style of thought (i.e., information processing style). Happy moods have been hypothesized to lead to category-level processing (Bless, 2000; Bodenhausen et al., 1994), heuristic processing (Schwarz & Clore, 2007), broadened attention (Fredrickson & Branigan, 2005), global attention (Gasper & Clore, 2002), approach motivation (Harmon-Jones, 2003), assimilation (Fiedler, 2001), substantive processing (Forgas, 2001), and relational processing

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(Storbeck & Clore, 2005). These explanations all assume a more or less fixed relation between affect and particular thinking styles. The current research was designed to test an alternative, simpler hypothesis; namely, that instead of a dedicated link between affect and thinking style, affect serves an informative function that signals the value of whatever mode of thought is currently accessible or dominant at the time (e.g., Clore et al., 2001; Clore & Huntsinger, 2009; Isbell, 2010; Isbell & Lair, in press). As with reward, positive affect should empower any response with which it is associated. In other words, positive affect may privilege one's own perspective, including whatever processing style is psychologically most prominent or salient for the perceiver in a given context. According to this view, the tendency for happiness to lead to heuristic, relational, global, or any other specific kind of processing may simply reflect the natural dominance of those modes of thinking on particular tasks. That is, given that global processing often has priority in many situations (Bruner, 1957; see Fiske & Taylor, 2008), it is not surprising that happiness is likely to confer value on this dominant response and encourage its use. In contrast, the information conveyed by sadness is likely to discourage its use.

The idea that the influence of affect on cognition is context dependent is consistent with recent work emphasizing the situated nature of cognition (e.g., Mesquita, Barrett, & Smith, 2010; Reis, 2009; Smith & Collins, 2010; Smith & Conrey, 2009; Smith & Semin, 2007). In contrast to traditional views of cognition that posit that cognitive processes are abstract and independent of context, this view argues that cognition is situated in organism–environment interactions that guide individuals' behavior in the moment. The notion that the impact of affect on cognition is situated follows closely from the affect-as-information framework (e.g., Clore et al., 2001, Wyer, Clore, & Isbell, 1999; see Martin, 2000; Martin, Ward, Achee, & Wyer, 1993).

The Affect-as-Information Approach and the Malleable Mood Effects Hypothesis

The basic premise underlying the affect-as-information approach is that affective experiences, which result from largely nonconscious, continuously operating appraisal processes, are adaptive and convey important and meaningful information to individuals who experience them (Schwarz, 1990; Schwarz & Clore, 2007). Given that affective responses occur along with other responses to an object, affective responses are experienced as a part of whatever is in one's mind at the time (Clore et al., 2001; Clore & Huntsinger, 2009; Isbell, 2011; Isbell & Lair, in press; see also Higgins, 1998; Wyer et al., 1999). Depending on the object of one's focus, affective responses may have different meanings and, consequently, different effects. Thus, the meaning or informational value of affect depends on the context in which it is experienced.

To emphasize the dynamic and changing nature of affect's influence on cognition, we propose the *malleable mood effects hypothesis*. This hypothesis specifically states that the impact of affect on processing is not fixed but instead is variable and malleable, and can easily be reversed by altering what processing inclination is currently accessible. This hypothesis is consistent with earlier work (e.g., Clore et al., 2001; see also Clore & Huntsinger, 2009; Isbell, 2010; Isbell & Lair, in press; Wyer et al., 1999), which states that individuals experience their affect as feedback about the value of their currently accessible mental content and processing inclinations. From this perspective, happiness confers positive value on accessible information, thereby promoting its use, whereas sadness confers negative value on this information, thereby inhibiting its use. Cues associated with happiness often serve as a "go" signal that facilitates the use of currently accessible information and processing inclinations, whereas cues associated with sadness serve as a "stop" signal that inhibits the use of this information (e.g., Clore et al., 2001; Wyer et al., 1999; see also Martin, 2000; Martin et al., 1993). The malleable mood effects hypothesis more fully explicates an important implication of these earlier theoretical formulations and highlights the nonobvious prediction that affective influences are highly malleable. That is, this hypothesis emphasizes the lack of connection between affective valence and information processing style. Predictions generated from this hypothesis stand in sharp contrast to those made by many existing theories of affect and processing, which posit a dedicated link between affective valence and specific processing styles.

Information processing often involves a combination of top-down, schema-driven, relational, global processing and more bottom-up, data-driven, item-specific, local processing (see Clore et al., 2001; Clore & Huntsinger, 2009), both of which are assumed to be constantly active. Although at any moment either of these processing approaches may have priority (Neisser, 1976), an overwhelming amount of evidence demonstrates that global processing tends to be naturally dominant both perceptually (e.g., Kimchi, 1992; Navon, 1977) and conceptually (see Fiske & Taylor, 2008) in many situations (Bruner, 1957). For example, in impression formation tasks, individuals typically (and often automatically) rely on global, category-based information as a basis for their judgments (e.g., Brewer, 1988; Fiske & Neuberg, 1990; see Fiske & Taylor, 2008, for a review). Importantly, the vast majority of research investigating the impact of affect on processing has relied on tasks that favor global responding (Clore & Huntsinger, 2007). Thus, not surprisingly, findings often reveal that happiness promotes global processes and sadness inhibits them. Such findings are consistent with the proposed malleable mood effects hypothesis and with the many theories that posit a direct link between specific affective experiences and specific processing styles. The key is to differentiate these explanations. The current research was designed to do this.

Overview of the Current Research

To assess the malleable mood effects hypothesis, one needs to alter individuals' dominant, default response tendency to respond globally to see whether positive affect continues to result in global (i.e., category-based) processing or whether it promotes operations associated with local (i.e., item-based) processing in a subsequent unrelated task (Freitas, Gollwitzer, & Trope, 2004; Gollwitzer, 1990; Gollwitzer, Heckhausen, & Steller, 1990; see also Forster & Dannenberg, 2010). Likewise, one also needs to examine whether negative affect continues to promote local (item-based) processing under these conditions or whether it encourages global (category-based) processing as predicted. The current research compares control conditions in which category-level processing naturally dominates (e.g., use of stereotypes) with experimental conditions in which detailed, item-level processing (e.g., use of specific behaviors) is made dominant.

The purpose of the research was to determine whether affective influences change in response to shifts in the salience or accessibility of different processing styles, or whether (as many accounts would predict) positive affect continues to promote global, category-level processing and negative affect continues to promote local, item-level processing. We chose mood effects on stereotyping as a general paradigm because it is a reliable phenomenon observed by many investigators (e.g., Bless, 2000; Bodenhausen et al., 1994; Isbell, 2004). A very large body of research (see Macrae & Bodenhausen, 2000, for a review) demonstrates that once a stereotype is activated, its use tends to be a default response during impression formation (see Fiske & Taylor, 2008). Positive affect validates and privileges such activated responses so that individuals in happy moods tend to show strong stereotyping effects. In our control conditions, we expected to replicate prior work demonstrating these typical effects of mood on stereotype use.

In three studies, three different methods were employed to momentarily alter people's tendency to adopt a global focus when forming impressions of others. Again, the question was whether increasing the accessibility of a local focus would reverse the usual mood effects on stereotyping. The standard position is that positive mood should continue to promote stereotyping effects, but the current malleable mood effects hypothesis predicts that positive affect promotes whatever orientation is most accessible at the moment. The basic logic of our approach is that in impression formation tasks, target attributes and perceiver reactions are generally experienced together as an undifferentiated whole. However, if perceivers are asked about their own reactions as a part of the whole, their focus necessarily becomes more local. Thus, in Study 1, half of the participants were initially asked questions about their current feelings, requiring a local focus that could be contrasted with the unchanged global focus of the control group. In Study 2, instead of directing participants to

focus on their own reactions, we selected individuals who had indicated that they naturally adopt such a local focus by attending to their own emotional reactions in response to affect-eliciting experiences. In Study 3, to make sure that any effects were not unique to self-focused attention, we treated questionnaires with a subtle but pleasant odorant. Prior research had indicated that unexplained odors cause participants to focus on the immediate environment (e.g., Lacey, 1967; Sokolov, 1963; Winneke, 1992), which was again expected to alter the usual global orientation in which target, context, and personal reactions are usually experienced as a whole.

In all three studies, participants heard or read a brief story about a day in the life of a woman named Carol, who was described either as an introverted librarian or as an extroverted salesperson. In addition to this category-level information, the story depicted an equal number of introverted and extroverted behaviors that Carol exhibited. Consistent with prior research demonstrating that primed attentional focus in one task carries over to influence subsequent tasks (e.g., Forster, Friedman, & Liberman, 2004; Trope & Liberman, 2003; Wakslak, Trope, Liberman, & Alony, 2006; see Forster & Dannenberg, 2010), we expected our local focus conditions to orient perceivers toward behavior-level rather than category-level social information. Thus, in the control conditions of each study, we expected positive affect to promote the default global focus, as usual. By contrast, in each of the local focus conditions, we expected positive affect to promote the newly accessible local focus, leading perceivers to show individuated rather than stereotypic judgments on the impression formation task.

Study 1

To test the proposed malleable mood effects hypothesis, Study 1 relied on naturally occurring differences in affect captured in telephone interviews (see Isbell, 2004; Isbell et al., 2005). Prior to completing an impression formation task, we asked some participants to think carefully about their current affective state. We expected that participants' focus on the details of their own affective states would make a local, behavior-level processing style most salient. For happy participants in this condition, this local mind-set was expected to carry over to influence processing in the subsequent impression formation task. Unhappy participants, who should inhibit reliance on this detailed processing mind-set, were expected to show more evidence of global (category-based) processing. Given that global, categorical processing tends to be the default in impression tasks (e.g., Bodenhausen et al., 1994; Isbell, 2004), we expected that in the control condition, where participants were not asked to think about their affective state, happy participants would show the typical pattern in which they rely on global, categorical processing. As usual, unhappy

control participants were expected to show behavior-level processing.

Method

Participants and design. One-hundred and fifty-five students (70 males) completed this study. Telephone numbers were randomly selected from each page of the student telephone directory. Students were contacted and asked to participate in a study that they could complete on the phone (see Isbell, 2004; Isbell et al., 2005). Participants were assigned to either the control (default categorical focus) or experimental (detail-oriented focus) condition and to either the librarian or salesperson stereotype condition.

Procedure

Control condition. Participants formed an impression of an unknown person named Carol. The experimenter first read background information about Carol, which described her as either an introverted librarian or an extroverted sales representative. The experimenter then read a story describing three introverted and three extroverted behaviors that Carol recently performed, as well as several behaviors that are neither introverted nor extroverted. This story is a shortened and revised version of one used by Snyder and Cantor (1979) and identical to the one used by Isbell (2004) and Isbell et al (2005). Following the story, participants rated Carol on a series of introverted (withdrawn, shy, a loner, quiet) and extroverted (talkative, self-confident, sociable, outgoing) traits using a scale from 0 (*not at all*) to 10 (*extremely*). Using the same scale, participants then rated the extent to which they felt happy at the moment.

Affect attention condition. Participants in this condition first reported how happy they felt and then were prompted to think more specifically about the details of their immediate affective state. Participants were asked, "Is the way you are feeling right now due to school, other people, specific events in your life, or something else?" Participants then rated the adequacy of this explanation for their current affective state. Next, participants completed the same impression formation task described earlier.

Results and Discussion

Influence of affect, stereotypes, and processing condition on trait judgments. Consistent with prior research, we expected that in the control condition, where categorical processing naturally tends to be dominant, happy mood would be associated with reliance on categorical information. In line with the malleable mood effects hypothesis, we expected the opposite pattern of results in the local, detail-focus condition. That is, we expected that increases in happiness would be associated with increased reliance on detailed behavioral information as a basis for impressions. To explore these possibilities, we

computed each participant's mean rating of Carol on the introverted traits and subtracted it from their mean rating of Carol on the extroverted traits. On this measure, higher scores reflect relatively greater impressions of extroversion.¹ If participants were focused on the specific behaviors in the story when forming an impression of Carol, their scores should be similar regardless of whether they received the librarian or sales representative information. In this case, participants' judgments would reflect their relatively greater reliance on individuating information. On the other hand, if participants focused on information about Carol's profession, their scores should be relatively more introverted or extroverted, reflecting greater reliance on stereotypical attributes associated with being a librarian or a salesperson, respectively.

In a hierarchical regression, the main effects of happiness, processing condition, and stereotype were entered in Step 1; all two-way interactions were entered in Step 2; and the three-way interaction was entered in Step 3. As predicted, a significant three-way interaction emerged, $B = -5.51$, $SE = 1.45$, $p < .01$. Consistent with expectations, in the control condition where global processing is naturally dominant (Figure 1A), greater happiness was associated with increased reliance on categorical information about Carol as a basis for impressions, whereas lower levels of happiness were associated with increased reliance on the mixed set of behaviors about Carol, $B = 2.14$, $SE = .75$, $p < .01$. In the detailed priming condition (Figure 1B), the opposite pattern of results emerged. Less happy participants' impressions of Carol reflected the categorical information about her, whereas happier participants' impressions reflected the mixed set of behaviors, $B = -3.39$, $SE = 1.32$, $p = .01$. These findings provide support for the malleable mood effects hypothesis, which states that happiness promotes reliance on the processing style that is currently most dominant, regardless if it is made dominant because of situational factors or is naturally dominant. In contrast, unhappiness inhibits such reliance on this information. These results provide initial evidence that neither happiness nor unhappiness is tied to specific information processing styles.

Study 2

The goal of Study 2 was to replicate and extend the findings obtained in Study 1 in two ways. First, we experimentally manipulated mood. Second, we examined differences in the chronic tendency for individuals to attend to their own affective states. In contrast to the control group, in which target information, context, and affective reactions tend to be experienced as a whole, individuals who characterize themselves as habitually focused on their own reactions constitute a more local, detail-focused condition. Thus, following an affect-eliciting experience (e.g., a mood manipulation), these individuals are likely to adopt a local focus on their current state. Hence, we expected these individuals to show effects of mood on processing similar to those found for

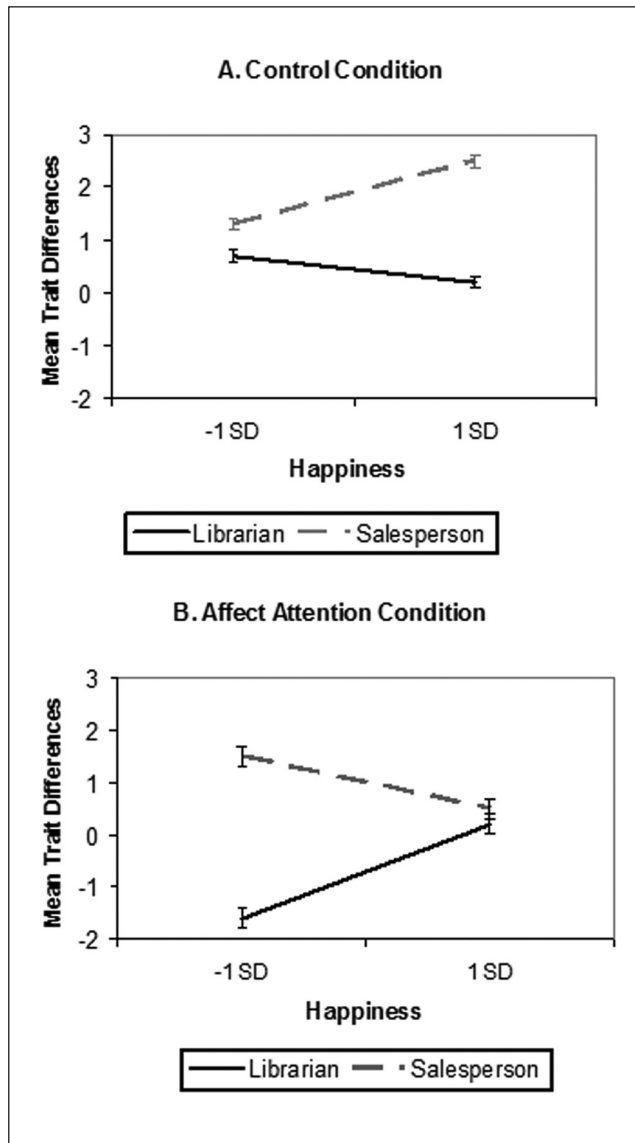


Figure 1. Mean trait difference score as a function of happiness level, stereotype, and condition

participants in Study 1 who were randomly assigned to focus locally on their current affective experience. We expected that the local focus would make the behavior-level information in the story most salient. In contrast, among participants who do not chronically attend to their own feelings, the default global, category-level processing would remain dominant. In this case, Carol's introverted or extroverted personality traits should be the most salient. As in Study 1, we expected these activated tendencies to interact with mood. Happy mood should promote, and sad moods should inhibit, the default global processing style in the low attention to emotion condition and the local processing style in the high attention to emotion condition.

Method

Participants and design. One-hundred and fifteen participants (35 males) completed this study for extra credit. Participants were recruited on the basis of their responses to the Emotional Creativity Scale (ECS; Averill, 1999) and the Meta-Mood Scale (MMS; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). These questionnaires were completed by more than 1,300 introductory psychology students as part of a web-based prescreening conducted during the first 2 weeks of the semester. The ECS assesses the degree to which individuals are aware of and examine their affective states, whereas the MMS assesses emotional attention, clarity, and repair. Both measures ask participants to indicate their agreement with affect-relevant statements. Given our interest in examining individuals who are particularly likely or unlikely to spontaneously consider the details of their affective experiences, we selected three items from the ECS (e.g., "I think about and try to understand my emotional reactions," "When I have emotional reactions I search for reasons for my feelings," and "I pay attention to other people's emotions so I can better understand my own feelings") and three from the MMS (e.g., "I often think about my feelings," "I don't think it's worth paying attention to your emotions or moods," and "I think about my mood constantly") that specifically tap this construct. Together these six items demonstrated adequate reliability ($\alpha = .78$) and loaded onto one factor in an exploratory factor analysis (all factor loadings $\geq .60$). A mean attention to affect score was computed on the basis of these six items for each participant. Participants were recruited if they scored in the upper or lower quartiles on this measure. They were randomly assigned to the mood (happy vs. sad) and stereotype (librarian vs. sales representative) conditions.

Procedure. Mood was experimentally manipulated by randomly assigning participants to write about either a recent happy or sad personal experience (e.g., Isbell, 2004; Schwarz & Clore, 1983). Specifically, participants were instructed to recall a recent life experience that made them feel happy (sad) at the time of the experience and continued to make them feel this way when they recalled the experience. Participants were given 8 min to write about the experience and how they felt when it happened. Participants were led to believe that the purpose of this task was to assist us in generating a database of college students' experiences.

Following the mood manipulation task, participants were introduced to an impression formation task, which was similar to the one used in Study 1 with two exceptions. First, the story about Carol was considerably longer, containing 12 extroverted behaviors, 12 introverted behaviors, and 15 behaviors that are neither extroverted nor introverted (Snyder & Cantor, 1979). In addition, the information about Carol was presented on a computer and participants read the information at their own pace and reported their judgments on the computer. Participants' judgments were computed as in Study 1. After this task, participants indicated on a scale

from 1 (*not at all*) to 5 (*extremely*) the extent to which they felt a variety of affective experiences (including happy and sad) while writing their stories.

Results and Discussion

Mood manipulation check. Participants' happiness and sadness ratings were analyzed as repeated measures as a function of mood, attention to affect, and stereotype. As expected, participants in the happy condition reported greater happiness ($M = 4.45$, $SD = .67$) than sadness ($M = 1.62$, $SD = 1.03$), whereas those in the sad condition reported greater sadness ($M = 3.98$, $SD = .98$) than happiness ($M = 1.44$, $SD = .69$), $F(1, 113) = 521.62$, $p < .01$, $\eta^2 = .80$. No other effects were significant, all $ps > .20$.

Influence of affect, stereotypes, and attention to affect on trait judgments. We predicted the same pattern of results as in Study 1. Specifically, we hypothesized that the effects of mood and stereotypes on participants' trait judgments would be moderated by individual differences in chronic attention to one's own affect. Consistent with our expectations and the findings of Study 1, we found a three-way interaction between these variables, $F(1, 113) = 8.40$, $p < .01$, $\eta^2 = .04$. As shown in Figure 2A, among participants low in attention to affect, we replicated the typical stereotyping findings, as well as those obtained in the control condition in Study 1 where global, category-level processing is naturally dominant. Happy participants relied on categorical information as a basis for their trait judgments, $t(113) = 3.87$, $p < .01$, $d = .49$, whereas sad individuals did not, $t(113) < 1$. As shown in Figure 2B, and consistent with the results obtained in the affect attention condition in Study 1, we found the predicted reversal among individuals high in attention to affect. Sad participants relied on categorical information as a basis for their judgments, $t(113) = 4.09$, $p < .01$, $d = 1.47$, whereas happy participants were less likely to do so, $t(113) = 1.88$, $p = .06$, $d = .45$.² These results are consistent with the malleable mood effects hypothesis in which the impact of happy and sad moods depends on what processing tendencies happen to be most accessible in a given context. However, one shortcoming of these studies is that in both, the local focus involved attention to one's self and internal experiences (i.e., one's psychological environment). Study 3 was designed to determine if a very different means of disrupting participants' usual global orientation would produce the same results. Specifically, we introduced an unexpected but pleasant odor to lead participants to shift focus from the whole impression formation situation to their immediate local environment.

Study 3

In Study 3 we sought to replicate the pattern of results obtained in Studies 1 and 2 by manipulating both mood and whether participants' attention was focused on their immediate physical environment. To do this, we introduced an

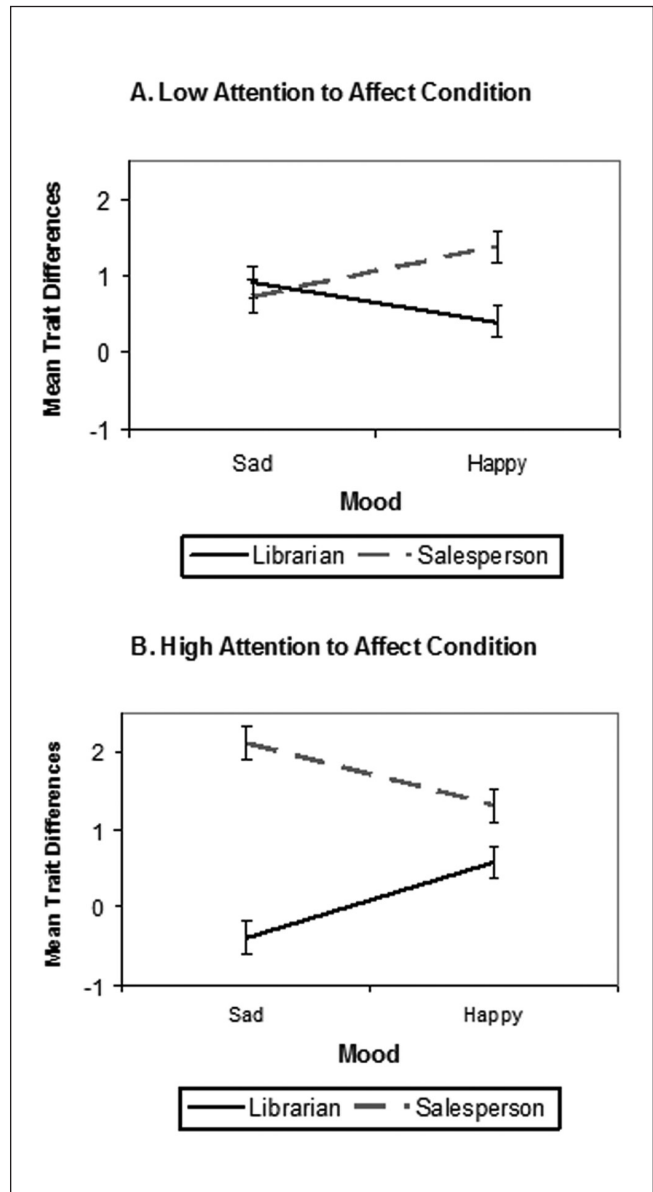


Figure 2. Mean trait difference score as a function of mood, stereotype, and attention to affect

unexpected stimulus (an odor) into participants' physical environments. Such a stimulus orients individuals to their immediate external environment (e.g., Lacey, 1967; Sokolov, 1963; Winneke, 1992) and narrows focus of attention (e.g., Barker et al., 2003). For example, Barker et al. (2003) found that when participants were exposed to an odor (compared to no odor), they performed better in alphabetization and typing tasks, both of which require attention to detail.

In our research, we sprayed questionnaires with a subtle, pleasant fragrance to direct respondents' attention to their immediate surroundings. Using this technique provides an opportunity to create a detailed environmental focus that is external to the self. Based on findings from our first two

studies, we expected that such a focus would lead participants to rely more on behavior-level information about Carol, whereas in the no odor control condition, where global, category-level processes are naturally dominant, we expected judgments to reflect the more abstract, category-level information. If happy mood promotes or maintains a currently dominant processing style and sad mood inhibits it, then affect should again interact with the currently dominant thinking style.

Method

Participants and design. Seventy-four participants (35 males) completed this study in partial fulfillment of a course requirement. Participants were randomly assigned to the mood, stereotype, and odor conditions.

Procedure. Participants first completed a brief questionnaire in which they reported personal information (e.g., age, gender) and completed several filler questions unrelated to the current study. All participants received this questionnaire in a closed envelope and were instructed to open the envelope, take the questionnaire out, and complete it. Participants in the odor condition received questionnaires that were treated with a fragrance, whereas those in the no odor condition received untreated questionnaires. After completing the questionnaire, participants placed it back in the envelope and the experimenter collected the envelopes. Participants were next introduced to the mood manipulation task and then to the impression formation task, both of which were identical to those used in Study 2. Afterward, participants indicated the extent to which they experienced a variety of affective states (including happiness and sadness) using scales from 0 (*not at all*) to 10 (*extremely*). Finally, participants were informed that some of the questionnaires distributed at the beginning of the study were treated with an odor and they were asked whether they had noticed the odor earlier.

Results and Discussion

Odor manipulation check. Ten participants in the odor condition reported that they did not detect the odor. These participants were equally distributed across both the mood and stereotype conditions, both $\chi^2(1) < .40$. Given that awareness of (and not simply the presence of) the unexplained odor was expected to lead participants to focus on the immediate environment, we combined these participants with those in the no-odor condition. Similar results emerge if we drop these 10 participants.

Mood manipulation check. Happiness and sadness ratings were analyzed as repeated measures as a function of mood, stereotype, and odor conditions. As expected, participants in the happy condition reported greater happiness ($M = 6.66$, $SD = 2.68$) than sadness ($M = 2.04$, $SD = 2.94$), whereas those in the sad condition reported greater sadness ($M = 7.06$,

$SD = 2.21$) than happiness ($M = 2.63$, $SD = 2.20$), $F(1, 66) = 68.07$, $p < .01$, $\eta^2 = .50$.³

Influence of affect, stereotype, and odor on trait judgments. Consistent with results obtained in the control condition in Study 1 and among participants low in attention to affect in Study 2, we expected that participants not exposed to the odor (and those who failed to detect it) should be more likely to have a default, category-level focus on the target. Hence, abstract, category-level information about Carol was expected to be most prominent in the no-odor control condition. Happy mood should promote or maintain reliance on such category-level information and sad mood should inhibit such reliance. In contrast, the unexplained odor was expected to induce a local, detailed orientation that would carry over to the impression formation task. In this case, the odor was expected to make the concrete, behavior-level information about Carol more likely to be relied on in the impression formation task. As in the detail-focused conditions of Studies 1 and 2, we again expected happy mood to promote or maintain reliance on behavior-level information, whereas sad moods should inhibit that tendency.

An analysis of participants' trait impressions (computed as in Studies 1 and 2) as a function of mood, stereotype, and odor revealed the predicted three-way interaction, $F(1, 66) = 6.81$, $p = .01$, $\eta^2 = .09$. In the no-odor condition (see Figure 3A), happy participants judged the sales representative to be relatively more extroverted than the librarian, $t(66) = 3.56$, $p = .01$, $d = 1.56$, whereas sad participants judged the two similarly, $t(66) < 1$. As expected, the opposite pattern of results emerged in the odor condition (see Figure 3B). That is, sad participants judged the sales representative to be relatively more extroverted than the librarian, $t(66) = 2.06$, $p = .04$, $d = 1.26$, whereas happy participants judged the two similarly, $t(66) < 1$.^{4,5} The results of Study 3 thus replicate those obtained in Studies 1 and 2 and are again consistent with the malleable mood effects hypothesis, which asserts that happiness promotes or maintains and sadness inhibits whatever processing tendency is dominant in the perceiver's mind.

General Discussion

The results of all three studies converge on a single conclusion. Feelings of happiness led individuals to rely on the most accessible information processing style, regardless if it was naturally dominant (as in our control conditions) or situationally induced (as in our experimental conditions), whereas feelings of unhappiness or sadness inhibited such reliance. This was true regardless of whether affect was measured (Study 1) or manipulated (Studies 2 and 3), whether participants were led to focus locally on their immediate psychological state (Studies 1 and 2) or physical environment (Study 3), and regardless of whether participants listened to the target information being read to them (Study 1) or read the information themselves at their own pace (Studies 2 and 3). Contrary to research suggesting that affective states are tied to

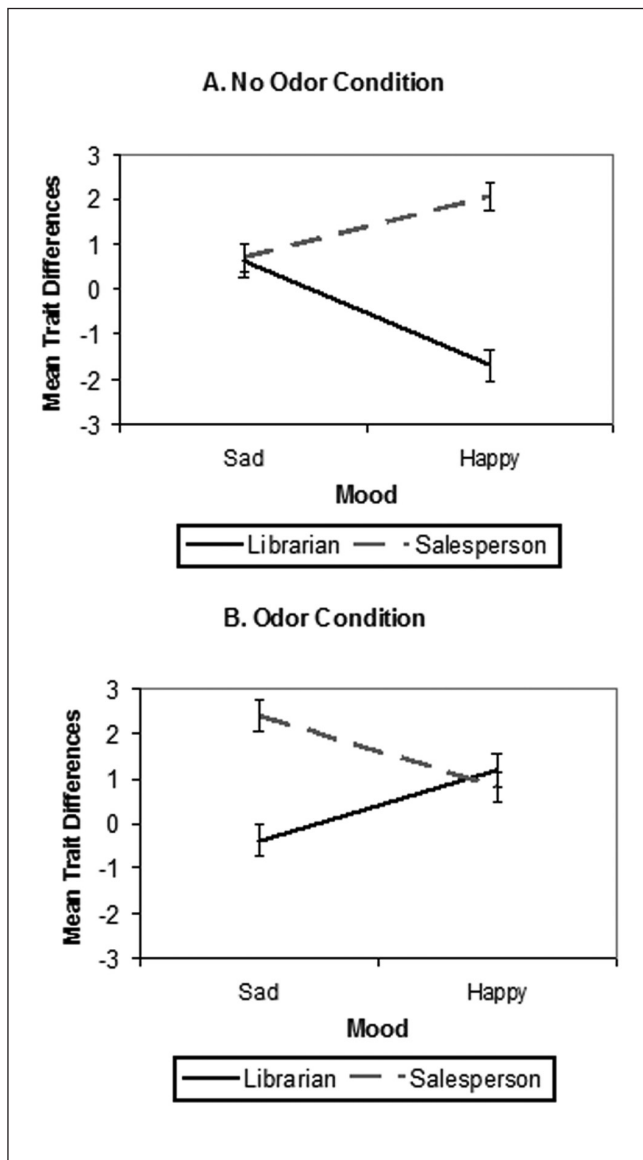


Figure 3. Mean trait difference score as a function of mood, stereotype, and odor condition

specific information processing styles (e.g., Bodenhausen et al., 1994; Gasper & Clore, 2002; Mackie & Worth, 1989; Schwarz & Clore, 2007; Wegener, Petty, & Smith, 1995), these studies suggest that the manner in which affect influences processing is not fixed but variable. Each study not only replicated the effects most commonly reported in the literature under the default, dominant global processing conditions (e.g., Bless, 2000; Bodenhausen et al., 1994; Gasper & Clore, 2002; Isbell, 2004; Schwarz et al., 1991; see Isbell & Lair, in press; Schwarz & Clore, 2007, for reviews) but also produced the reverse by inducing in some conditions a local, detail-focused orientation that made concrete, behavior-level information dominant at the time. Thus, the *same* affective states led individuals to attend to and process social information differently depending on whether a default,

dominant, global thinking style or a situationally induced, detailed-oriented thinking style was accessible for perceivers at the time.

Our results are consistent with other statements of the affect-as-information approach (e.g., Clore et al., 2001; Clore & Huntsinger, 2009; Martin, 2000; Martin et al., 1993; Wyer et al., 1999). In this view, affective reactions are embodied evaluations that confer positive or negative value on currently accessible styles of thought or information. By making a local, behavior-level processing style dominant in studies of stereotyping, we found that positive affect just as readily promotes that style as the typically dominant, global or category-level processing style in the control conditions.

A small number of other studies are consistent with both the malleability hypothesis and our findings. For example, Storbeck and Clore (2008) found that happy moods facilitated semantic and affective priming, whereas sad moods inhibited such effects. Likewise, compared to sad individuals, happy individuals have been found to be less successful at suppressing an unwanted (i.e., accessible) thought (Wyland & Forgas, 2007). Individuals in happy moods are more likely to adopt an accessible goal and behave accordingly, whereas those in unhappy moods are more likely to reject accessible goals (Fishbach & Labroo, 2007). In a similar vein, participants induced to feel happy after being exposed to a persuasive communication based their attitudes on their currently accessible thoughts, whereas those in sad moods did not (Brinol, Petty, & Barden, 2007). Relative to sadness, happiness also reduces stereotype activation when counterstereotypic thoughts are made accessible (Huntsinger, Sinclair, Dunn, & Clore, 2010).

A few other studies have directly primed local processing and have revealed support for the malleability hypothesis. For example, following exposure to a local processing prime, individuals in happy moods respond to the local elements in perceptual identification tasks, whereas those in sad moods respond to the global elements (Huntsinger, Clore, & Bar-Anon, 2010). Thus, the local processing prime reversed the typically observed effects of mood on global and local perception (Gasper & Clore, 2002). In a recent study conducted in our laboratory, we primed happy and sad participants with a global or local processing prime and then had them make judgments of intergroup variability (Isbell & Lair, 2011). Following a global prime, the typical effect of mood on variability judgments emerged (e.g., Queller, Mackie, & Stroessner, 1996; Stroessner & Mackie, 1992; Stroessner, Mackie, & Michaelson, 2005). That is, happy individuals judged group members to be more similar to one another than did sad individuals. As predicted by the malleability hypothesis, the local prime reversed this effect. In this case, sad individuals perceived greater similarity than did happy individuals. Consistent with these studies, our current findings demonstrate that happy moods promote reliance on currently dominant responses or modes of thought, whereas sad and unhappy moods inhibit such reliance.

Compatible Views

Brinol and Petty (e.g., 2003) have proposed a compatible view in the persuasion domain. They suggest that positive and negative affective cues (e.g., head shaking and nodding) can have the effect of validating or invalidating currently accessible thoughts. For example, shaking one's head can invalidate both positive thoughts elicited by strong persuasive arguments and negative thoughts elicited by weak arguments, reversing the usual effects of strong and weak arguments on persuasion. Also consistent with the idea that positive affect is not dedicated to global, category-level processing are results by Gable and Harmon-Jones (2008; see also Harmon-Jones & Gable, 2009). They found that positive affect can promote a local rather than a global focus when it reflects not general happiness but approach motivation directed at a specific goal. Furthermore, research suggests that positive affect is associated with flexible processing and facilitation of switching between global and local processing in visual perception tasks (e.g., Baumann & Kuhl, 2005; Tan, Jones, & Watson, 2009), greater set switching in a cognitive control task (e.g., Dreisbach & Goschke, 2004), and greater flexibility and creativity in insight and problem-solving tasks (e.g., Ashby, Isen, & Turken, 1999; Subramaniam, Kounios, Parrish, & Jung-Beeman, 2009). Our findings, like those of Brinol and Petty and others, suggest that negative affect like positive affect may also lead to flexible processing depending on the context in which it is experienced. Together, all of these findings are compatible with the more general recent intellectual movement to examine cognition as socially situated rather than as a product of abstract and stable mental processes that are independent of the context in which they occur (e.g., Mesquita et al., 2010; Reis, 2009; Smith & Collins, 2010; Smith & Conrey, 2009; Smith & Semin, 2007).

Can Discounting of Affective Cues Account for the Results?

Although we believe that the results of all three studies are most consistent with the malleable mood effects hypothesis, we consider a possible alternative interpretation of our results in Studies 1 and 2. One could speculate that having participants' attention drawn to the details of their affective state may have led participants to discount the informational value of their affective cues, which may have altered the effects of mood on processing in the impression formation task. Although a key tenet of the affect-as-information model does maintain that affective cues are relied on only if they are perceived as relevant feedback about whatever is currently in one's focus of attention, such discounting manipulations routinely eliminate processing differences (e.g., Beukeboom & Semin, 2006; Gasper, 2004; Hirt, Levine, McDonald, Melton, & Martin, 1997; Isbell et al., 2011; Sinclair, Mark, & Clore, 1994; see Isbell & Lair, in press; Schwarz & Clore,

2007, for reviews). For example, Sinclair et al. (1994) found that the typical effects of mood on persuasion are eliminated when individuals are led to attribute their feelings to a source-irrelevant cause (i.e., the weather). Relatedly, Beukeboom and Semin (2006) found that the influence of affect-induced global and local processing styles led happy participants to describe a film in more abstract language than sad participants; however, this difference was eliminated when the source of participants' affect was made salient. Isbell et al. (2011) reported a similar effect in an investigation of the influence of affective states on individuals' spontaneous self-descriptions.

To our knowledge, no published research provides evidence that discounting manipulations reverse the typical mood and processing effects. To invoke such an explanation for the results of Studies 1 and 2, it seems that one would have to assume that participants first attributed their moods (thus eliminating the effects of mood on processing) and then engaged in a corrective process that led to the reversal of the typically observed effects. Although possible, this discounting and correction explanation cannot account for the results of Study 3, nor can it easily account for the results of other research described earlier that reports similar effects in different paradigms. We believe that the malleable mood effects interpretation offers a more parsimonious explanation for our findings across all three studies.

Conclusions and Implications

Together, the results of our studies and recent research on affect suggest that understanding the impact of affect requires knowing more than just the affective state. It also requires knowing what is accessible or dominant in the mind of the perceiver at the time. In most research on affect and processing, factors such as what processing style was currently dominant were not considered. Consequently, the typically observed effects of mood on processing were heavily influenced by the global processing style that is the default, and naturally dominant, response for a vast majority of the participants in these studies. For this reason, it is not surprising that a voluminous body of literature has emerged in support of a dedicated link between mood and information processing styles (see Isbell & Lair, in press; Schwarz & Clore, 2007, for reviews). The prevalence of such "typical" effects has led many researchers to define the relation between affect and processing as a fixed one.

The recent situated cognition movement has alerted researchers to the importance of carefully considering contextual factors when examining social cognitive processes. Our work is in the same spirit as this movement. We believe that considering the interaction between individuals' affective states and their current psychological and physical environments has exciting implications for understanding what might otherwise be puzzling findings, and it has the potential to generate new research questions. For example,

cultural research demonstrates that Westerners value independence (i.e., individualism) and tend to be insensitive to contextual information, whereas Easterners value interconnectedness (i.e., collectivism) and tend to be highly sensitive to contextual information (e.g., Markus & Kitayama, 1991). The current work suggests that happiness confers positive value on these dominant thinking styles and encourages their use. Relevant data come from studies conducted in South Korea and the United States showing that rather than affecting both cultures similarly, induced positive affect had the same effects as those hypothesized here (Koo, Clore, Kim, & Choi, 2011). That is, on a task in which Koreans engage in holistic reasoning and Americans tend to employ analytic reasoning, happy mood promoted the dominant reasoning style in each culture, and sad mood elicited the opposite styles. These findings, along with the results of our studies using Western research participants, are consistent with the malleable mood effects hypothesis.

Authors' Note

The first two authors contributed equally to this work.

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Notes

1. We used difference scores in all three studies because our hypotheses pertained to participants' relative judgments of the target as extroverted (vs. introverted) rather than the absolute extremity of their judgments. To ensure that our difference scores do not conceal any odd patterns of data, we also analyzed the introverted and extroverted variables as repeated measures and found identical patterns (e.g., Keppel & Wickens, 2004). Furthermore, in each study we found a significant negative correlation between participants' introverted and extroverted target ratings (mean $r = -.43$). An examination of the scatterplots demonstrated that individuals who received large difference scores rated the target high on one variable and low on the other, whereas those who received small difference scores tended to rate the target near the midpoint on both scales. Taken together, these findings demonstrate that our use of difference scores does not conceal other patterns of data and does not result in a loss of information concerning the extremity of participants' ratings.
2. In addition to the three-way interaction, we found a main effect of stereotype, which revealed that participants rated Carol as more extroverted when she was a sales representative ($M = 1.82$, $SD = 1.36$) compared to when she was a librarian ($M = .20$, $SD = 1.83$), $F(1, 113) = 9.90$, $p < .01$, $\eta^2 = .07$.

3. Dropping the 10 participants who failed to detect the odor led to similar findings. Specifically, participants in the happy condition reported greater happiness ($M = 6.62$, $SD = 2.76$) than sadness ($M = 2.25$, $SD = 3.01$), whereas those in the sad condition reported greater sadness ($M = 7.00$, $SD = 2.25$) than happiness ($M = 2.60$; $SD = 2.18$), $F(1, 56) = 57.93$, $p < .001$, $\eta^2 = .50$.
4. In addition to the three-way interaction, we found a main effect of stereotype, which revealed that participants exposed to the sales representative judged her to be relatively more extroverted than those exposed to the librarian (5.91 vs. -.25), $F(1, 66) = 5.54$, $p = .02$, $\eta^2 = .07$.
5. Dropping the 10 participants who failed to detect the odor led to similar findings. That is, individuals exposed to the sales representative judged her to be relatively more extroverted than did those exposed to the librarian (5.78 vs. .27), $F(1, 56) = 4.25$, $p = .044$, $\eta^2 = .06$. This main effect was qualified by the predicted three way interaction between mood, odor condition, and stereotype, $F(1, 56) = 4.91$, $p = .03$, $\eta^2 = .07$. As expected, in the no-odor condition, happy participants judged the sales representative to be relatively more extroverted than the librarian (7.71 vs. -4.17), $t(56) = 2.49$, $p = .016$, $d = 1.38$, whereas sad participants judged the two similarly (2.71 vs. 2.00), $t(56) < 1$. In the odor condition, sad participants judged the sales representative to be relatively more extroverted than the librarian (9.5 vs. -1.5), $t(56) = 2.08$, $p = .04$, $d = 1.26$, whereas happy participants judged the two similarly (3.20 vs. 4.75), $t(56) < 1$. No other significant effects emerged, all F s < 1 .

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