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The Influence of Positive Affect on the Unusualness of Word Associations

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A pilot study and two experiments investigated the influence of positive affect, induced in three differing ways, on the uniqueness of word associations. Persons in the positive-affect conditions gave more unusual first-associates to neutral words, according to the Palermo & Jenkins (1964) norms, than did subjects in the control conditions. In Study 3, where word type (positive, neutral, negative) was a second factor along with affect, in a between-subjects design, associates to positive words were also more unusual and diverse than were those to other words. These results were related to those of studies suggesting that positive affect may facilitate creative problem solving and to other work suggesting an impact of positive feelings on cognitive organization.

A growing body of research suggests that positive affect may have a wide range of effects on cognitive processes. For example, positive feelings have been shown to serve as a retrieval cue for positive material in memory, influencing such measures as the reaction time for recall of positive words and the subset of words likely to be recalled from a memorized list (e.g., Isen, Shalker, Clark, & Karp, 1978; Laird, Wagener, Halal, & Szegda, 1982; Nasby & Yando, 1982; Teasdale & Fogarty, 1979). Moreover, a mild positive affective state has also been shown to influence judgments of various kinds, decision-making strategies, and willingness to take risks (e.g., Isen & Means, 1983; Isen, Means, Patrick, & Nowicki, 1982; Isen & Patrick, 1983; Isen, Pratkanis, Slovic, & Slovic, 1984; Isen & Shalker, 1982; Isen et al., 1978; Johnson & Tversky, 1983; Schiffenbauer, 1974).

Recently, it has been suggested that positive affect may influence the way in which cognitive material is organized or interpreted, and that material may have a different meaning or function when one is feeling happy from that which it has at other times (Isen, 1983; Isen, 1984; Isen & Daubman, 1984). This suggestion is compatible with the contextualist position in cognitive psychology, which holds that the cognitive context (as distinct from the simple stimulus context) in which material appears may influence the meaning or interpretation given to that material (e.g., Bartlett, 1932; Bransford, 1979). That is, as noted, positive affect has been found to cue positive material in memory and thus influence the contents of working memory; and the contextualist or constructivist position suggests that the cognitive context, or contents and complexity of working memory, can influence the interpretation given to other cognitive material. Thus, according to the contextualist position, in comparison with someone in a neutral state, a person who is feeling happy might also be expected to give a different meaning to cognitive material (not just a more positive meaning), because he or she might be expected to think about things and perform cognitive tasks with a different and more complex cognitive context present.

Moreover, it makes sense that cognitive context (the specific items present in working memory at any given time and the interpretation given to them) might influence the way in which the entire set of material would be organized as well. Recent studies have demonstrated this very point. Tversky & Gati

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(1978), for example, found that the perceived similarity, or categorization, of a given pair of items varied as a function of the other items (the cognitive context) that were present at the same time that the judgment was being made. Thus, because positive affect cues a broad set or range of material (positive material has been found to be more extensive than other material: e.g., Boucher & Osgood, 1969; Bousfield, 1944), the affective state may also influence the organization of working memory; and the happy person, besides thinking of or interpreting material differently, may see a different set of relations among items under consideration.

Experimental results compatible with this suggestion regarding the influence of affect on cognitive organization, or the noting of potential relatedness, have recently been reported (Isen, 1983; Isen, 1984; Isen & Daubman, 1984). One series of studies found that persons in whom positive affect had been induced in any of three ways tended to categorize more stimuli together, as reflected by either a sorting task or a rating task. Moreover, two additional studies found that positive affect facilitated performance on a task requiring creative problem-solving ability (i.e., requiring that subjects see potential relations not usually noticed between elements of the stimulus materials). Another experiment found that positive affect facilitated recall of 10 relatable, but not obviously related, words within a list of 30 to be recalled. All of these results converge to suggest that material may be organized differently when one is happy, or at least that the cognitive context in which the task is performed may be different.

The present article extends these findings by examining in more detail the influence of affect on the unusualness of word associations. Word association has a long history as both an independent variable and a dependent variable in psychology (see, e.g., Cramer, 1968, for a review of the work from 1952–1964 and reference to earlier reviews of still earlier literature). The literature on word association constitutes a rich source of information regarding the impact of context effects and of the affective content of the stimulus words on this response. A complete review of the literature on word association is beyond the scope of this article; however, three points from this literature should be noted.

First, it has been suggested that word-association responses may reflect cognitive organization or at least processes that may influence cognitive organization (e.g., Cramer, 1968, esp. chap. 10). Cramer (1968), for example, attributes word association to a process of activation of associative domains, or associative response hierarchies (p. 277), which is compatible with current process-oriented views of memory (both network and constructivist views).

Second, the following specific findings bear relevance to the impact of affect on cognitive organization and unusual responding: (a) pleasant stimuli elicit a greater number of associates, even when the word-lists are balanced for frequency of occurrence in the language (e.g., R. C. Johnson & Lim, 1964; Matlin & Stang, 1978); and (b) a more complex cognitive context (e.g., a compound stimulus word) results in more diverse responses to the stimulus word (e.g., Cramer, 1968). These findings suggest that, on the whole, word associations to positive *words* might be expected to be more unusual or unique than those to neutral words, because the positive words create a more complex cognitive context by cueing more associates.[1]

Moreover, there is also reason to expect a positive affect *state* to result in more unique or diverse associations than would a neutral affective state. This is because positive affect cues positive material in memory (e.g., Isen et al., 1978), and positive material in memory is more extensive than other material (e.g., Boucher & Osgood, 1969; Bousfield, 1944, 1950; Matlin & Stang, 1978; White, 1936;

[1] It should not be assumed, however, that negative words would therefore produce fewer unique responses than do neutral words. Although the area is marked by contradictory findings, a number of studies suggest that negative or "emotional" words elicit more idiosyncratic responses (e.g., Cramer, 1968). This phenomenon is theorized to occur for a different reason (implicit avoidance responses) from the one proposed here as underlying the similar-appearing effect of positive feelings, and other findings suggest that the pool of associates to negative words is smaller than that of positive words (Cramer, 1968).

White & Powell, 1936), thereby creating a more complex cognitive context for the word-association task.

The third point from the word-association literature that is relevant to the present formulation is that word association, as both an independent variable (e.g., Freedman, 1965; Maltzman, Simon, Raskin, & Licht, 1960) and a dependent measure, has been associated with creativity (e.g., M. T. Mednick, S. A. Mednick, & E. V. Mednick, 1964; S. A. Mednick, 1962), which may itself be related to the organization of cognitive material and the ability to see interrelations among stimulus elements.

Thus, the word-association literature contains a body of information supportive of the suggestions, (a) that positive affect may influence word association, and (b) that such a finding, together with others converging on the concept of cognitive organization, might be indicative of an impact of affect on cognitive organization. The present studies attempt to examine the influence of positive affect on the uniqueness of word association, in the interest of contributing eventually to our understanding of the influence of good feelings on cognitive organization and creativity.

Pilot Study

A pilot study has shown that persons in whom positive affect had been induced, by means of refreshments at the experimental session, gave more unusual first associates to a randomly selected group of words from the Palermo & Jenkins (1964) list than did members of a control group that had not been offered refreshments (Mp = 6.60, Mc = 5.28; $t(18) = 1.88$, $p < .05$; Isen, 1983). One possible alternative interpretation of these findings is that the affect induction used (refreshments) may have constituted an *unusual* stimulus situation and that it was the experience of something unusual, rather than of something pleasant, that resulted in a greater number of unusual first associations among that group of subjects. Other research has shown that encouraging unusual responses or giving subjects experience with different responses does appear to increase the occurrence of originality on word-association tasks (e.g., Cramer, 1968), and that exposure to solution of a task requiring creative problem solving can facilitate performance on a subsequent, different creative problem-solving task (Isen, 1983). Thus, Study 1 attempted to replicate the earlier affect-and-word-association finding using, however, a different technique of affect induction, one that would not constitute an unusual stimulus. The technique employed was word association to affectively valenced words.[2]

Study 1

Method

Subjects. Forty university students participated in the study, which was conducted in classroom-administered sessions. The subjects were students in one of two sophomore-level courses.

Procedure. As noted earlier, affect was induced in this study by means of word-association to affectively valenced words. The experimenter distributed word-association booklets (composed of 20 words, each on a separate page, followed by a rating task at the end of the booklet) to the subjects. The booklets were distributed randomly, so that some subjects in each class were assigned to each condition. Subjects were asked to read the words, one at a time, to write down their first association to each word, and then to fill out the scale at the end of the booklet. They were encouraged to work quickly, giving the first response that came to mind. At the end of each session, the experimenter discussed the point of the study and certain methodological issues with the class. This constituted a debriefing.

Stimuli. The booklets were constructed so that in one third of the cases the first 10 words were positive, in one third they were negative, and in one third they were neutral, while the second 10 words were neutral in all cases. Thus, the first 10 words constituted the independent variable manipulation, and the second 10 words the stimuli for the dependent measure. Words were randomly ordered within list types.

All words were nouns and adjectives from the Palermo and Jenkins (1964) list of word-association norms (which themselves had been selected from the Kent-Rosanoff list and A–AA frequency words of the Thorndike-Lorge list). A group of 80 nouns and adjectives from the Palermo and Jenkins list had been rated for pleasantness, on a scale from 1–7, in a pretest using a different group of 36 subjects. From these, a list of 10 positive (mean rating = 6.08) and negative (mean rating = 2.02) words were selected, as were two groups of 10 neutral words each (mean ratings = 4.33, 4.29).

The rating task that followed the word associations required that a list of 10 words be rated "good-bad" on

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[2] The authors wish to thank Paul Slovic for suggesting this means of affect induction.

a 7-point scale (with "1" the positive pole of the scale). It was used to check on the manipulation of affect. This list was composed of 5 familiar and 5 unfamiliar words used by Matlin (1970), who found that unfamiliar words tended to be rated more negatively than familiar, and by Isen (1983), who reported that, relative to a control group, the rating of unfamiliar words was significantly more positive (and that of familiar words a bit more negative) among subjects who had been made to feel good.

Results

Manipulation checks. As a check on the manipulation of affect, subjects were asked to rate the pleasantness of unfamiliar words (the final page of the booklet described earlier), a task used in other research to check on the manipulation of affect. In previous research, four studies, using four different positive-affect inductions and two negative, found positive affect to be associated with significantly more positive ratings of unfamiliar words and a nonsignificant tendency toward more negative ratings of familiar items. These studies have also reported, in contrast, that negative affect tends to result in lower ratings of familiar items but not unfamiliar ones. As in the previous research, in the present study persons in the positive affect condition (those who had given word associations to 10 positive words before associating to the neutral words) rated unfamiliar words significantly more positively than did the control group, $t(27) = 2.05$, $p < .05$, but rated familiar words more toward the opposite pole (more negatively), though not significantly so, $t(27) = 1.40$, $.05 < p$. This suggests that the positive-affect induction was successful in producing the desired state.

The negative-affect induction had no effect on the rating of unfamiliar words ($t < 1$), just as had been found in earlier studies; but unlike the results obtained previously, it had no effect either on the rating of familiar words ($t = 1.30$). These findings suggest that, in contrast with the positive-affect induction, the negative induction may not have been successful in producing the desired state.

In order to examine this question further, subjects' word associations (each subject's first associate to each word) to words 11–20 (the 10 neutral words that constituted the stimuli for the dependent measure) were rated for pleasantness on a scale from 1–7 by a rater who was unaware of the subject's experimental condition at the time of rating. These results revealed that the positive-affect subjects' associates to subsequent neutral words were more positive than the control group's ($M = 4.54$, 4.29, respectively, $t = 2.33$, $p < .025$); however, association to the 10 negative words did not influence the affective tone of those subjects' associations to the neutral words that followed ($M = 4.35$, $t < 1$). These results parallel those observed before in the word-association literature, that people's associations to positive words tend to be positive, but that their associates to negative words do *not* tend to be negative (e.g., Cramer, 1968; Pollio, 1964). However, these results extend those findings to include, now, subjects' responses to neutral words *following* association to 10 positive or negative words. This measure might be seen as a second form of manipulation check, the results of which then suggest, consistently with those of the pleasantness-rating task just reported, that positive affect was successfully induced but that negative affect was not.

Measures of unusualness. Table 1 presents three different measures of the unusualness of the word associations of subjects in the three conditions. Subjects' responses were scored for uniqueness by referring to the word-association norms (Palermo & Jenkins, 1964). For the first measure, a response was considered "unusual" if it had a score that was 5% or less of the total score of the most frequent associate. For example, the word *home* is listed as having been given in response to the word *house* by 106 of the male, and 124 of the female, (230 in total) college-level respondents. Thus, any word given by 11 or fewer of respondents was scored an unusual response to house. Using this measure, the criterion for the definition of unusual was different for each word. A word with a single, very strong (frequent) associate had a higher cutoff point; one with several weaker associates would require the subject's response to be more rare before it would be called *unusual.*

Second, disregarding the strength of the most popular associate, a second measure of uniqueness was constructed: Associations were rated as unusual if they were given by 2.5% or fewer of the respondents. Because

Table 1
Study 1: Unusualness of Word Association in Each of Three Affect Conditions

M	Positive affect (n = 15)	Neutral affect (n = 14)	Negative affect (n = 11)
Mean number of unusual associates[a]			
M	5.40	3.86	4.09
s^2	4.11	3.21	4.69
Mean number of unusual associates[b]			
M	4.93	3.36	3.36
s^2	4.07	3.94	3.25
Mean number of respondents in the normative sample (N = 1,000) giving the same response			
M	47.86	78.12	63.01
s^2	880.67	734.07	915.99

[a] Defined in terms of the frequency of the most frequent associate (see text for details).
[b] Defined independently of the popularity of the most frequent associate (see text for details).

there were 500 college-age respondents of each gender, for this measure a score of 12 or less was always the criterion for the designation *unusual.* A third measure of the unusualness of subjects' associations was obtained by averaging the number of respondents in the normative sample who had given the same response as the subject. As can be seen from Table 1, all three measures indicate that subjects in whom positive affect had been induced by free association to positive words had more unusual associates to the neutral words that followed the initial, affect-inducing (or control) set.

Planned comparisons revealed the predicted effect of positive feelings on uniqueness of associations, for each of the three measures, $t(27) = 2.17$, $p < .025$; $t = 2.12$, $p < .025$; $t = 2.87$, $p < .005$. There was no effect of negative affect as induced in this study.

Discussion

These results indicate that positive feelings result in more positive first associates to neutral words and more unusual first associates to neutral words, as reflected by each of three indices of uniqueness. They are in agreement with the findings reported previously that positive affect induced by the presence of refreshments and a relaxed atmosphere led to an increased number of unusual associates to a randomly selected list of words (Pilot Study; Isen, 1983). They extend the earlier work by having used a different means of affect induction (word association), by having used a written-presentation procedure (whereas the previous study had employed a technique involving oral presentation of the words), by having used a list of pretested neutral nouns and adjectives as the stimulus words for the dependent measure (whereas the earlier study had used a randomly selected list from the Palermo & Jenkins corpus of words), and by having included a negative-affect induction as well as the positive.

The attempt to induce negative feelings and to influence the affective tone and unusualness of associations to neutral words by the technique of word association seems not to have been successful for negative affect, even though the negative words were rated in pretests as significantly different from neutral, and relatively as negative as the positive words were positive. At first glance, these results might seem surprising; yet, on reconsideration they are quite compatible with previous work reporting nonsymmetrical results of positive and negative affect inductions. For example, Isen et al. (1978) found increased accessibility of positive material in memory following success, but no parallel increase in the accessibility of negative material following a failure. Likewise, Teasdale and Fogarty (1979) and, recently, Nasby and Yando (1982) found a similar lack of symmetry, as have other researchers (see Isen, 1984, and Isen, in press, for a fuller discussion of the data relating to this issue).

Our present results also accord with other data suggesting that word associations remain positive following positive-affect induction, but quickly become neutral or positive following negative-affect induction. Subjects reportedly do not produce chains of negative associates to negative words (e.g., Cramer, 1968; Pollio, 1964); neither, according to the present results, do they continue to have negative associations following the activity of giving their first associate to each of 10 negative words. These findings are compatible with others in the word association literature that suggest that the pool of associates to negative words is small (e.g., Cramer, 1968; Pollio, 1964), even though these words have sometimes been found to produce a diversity of first-associates (e.g., Cramer, 1968).

Thus, the technique of word association as a means of affect induction may not be useful for inducing negative affect. It simply may not induce affect; or it may induce the negative state but also rapidly trigger, in normal subjects, a tendency to return the negative state to neutral or positive. Because we conceptualize the first 10 words as the affect-induction phase, and words 11–20 as the dependent measure, the first available manipulation check (ratings of the affective tone of the subjects' associates) did not occur until the 11–20th word associations. Thus, if negative affect had been induced after the first few negative word associations of the affect-induction phase, subjects might already have begun the mood-repair process by the time they reached words 11–20. In either case, however, the results suggest that the technique of word association may not be successful for manipulation of negative affect in experiments, even though this technique appears to be successful for inducing positive affect.

These results are not easily interpreted as a function of the freakishness of the independent variable manipulation—that is, that the manipulation represents an unusual stimulus or situation and thereby cues unusual associations. While this interpretation might have been proposed regarding the earlier study that used refreshments to induce positive affect, it is not a plausible hypothesis in the context of the present study. The task of word association to 10 common words hardly constitutes an unusual situation, and there is no reason to believe that the positive words themselves were more unusual than the neutral. (All words had been selected from the Palermo and Jenkins corpus, which itself had been composed of words of about equal frequency in the language.) In fact, if anything, positive words have been found to be more common, not more unusual (e.g., Zajonc, 1968). Thus, it would be hard to argue that the positive words constitute a more unusual stimulus and for this reason alone prime unusual associates.

The results of this study confirm that unusual associations are to be expected from persons who are feeling happy. Another alternative interpretation that does not appear viable is that the effect is due to the fact that people who feel good give positive associates, but neutral words are more likely to appear in the word-association norms. The third index of unusualness, scoring of the absolute number of respondents giving each subject's response, was included to provide some evidence relating to this issue. Other details of subjects' responses that bear upon this matter will be presented next.

Although subjects in the positive affect condition did average significantly more 0-frequency responses ($M = 2.33$, $M = 1.14$; $t(27) = 2.08$, $p < .05$), they usually gave responses that appeared in the norms, but less frequently than those of control subjects. In addition, their unusual associates were not always stereotypically positive words. For example, subjects in the positive condition responded to "house" with low frequency associates (Palermo & Jenkins norms in parentheses) such as "security" (3), "apartment" (2), and "residence" (0); and when they gave rather common associates, these were often words that were less frequent than the most usual associate, "home" (230): "family" (27), brick (26), garage (36). In this condition only 3 of 15 subjects (20%) responded with the most common associate, whereas in the control condition 5 out of 14 (36%) did so. For a second example, to "carpet" people in the positive-affect condition responded with unusual words such as (again, Palermo and Jenkins norms in parentheses) "plush" (4), "living room" (5), "fresh" (0), "green" (6), "texture" (4), and "shag" (10). As in the example above, when subjects gave more

common associates they were more often *moderately* popular responses such as "soft" (206) and "floor" (153) rather than the most common associate, "rug" (311). "Rug" was given by only 3 of 15 (20%) positive-affect subjects, whereas 10 out of 14 (71%) control subjects gave that response. This pattern was repeated across the words, so that overall there was a significant difference, in the expected direction, between the two affect conditions in number of times the most common associate was given (M/subject = 2.27, 3.64; $t(27) = 2.41$, $p < .025$).

Thus, it can be seen that subjects in the positive-affect condition had more unusual associates than did a control group, and that this effect was not due simply to the positive-affect subjects having more pleasant associates, which as a group happened to be less common responses to the stimulus words. The associations given by the positive-affect subjects do not appear to be organized around the Affect factor (with their unusualness an artifact of this); rather the associates given by subjects in whom positive affect had been induced appear to be organized around the stimulus word but more broad-ranging than the usual responses. These associates also tend to be slightly more positive in tone than the more common associates are.

It might be argued that the word association technique, even in the positive condition, did not produce the observed effect because of the *affect* it induced, but only produced its effects by direct priming of similar or associated words (word-to-word priming, requiring no mediation by affective state). That is, in our formulation, the change in rated pleasantness of the associates generated is assumed to have been due to the type of word primed by the *affective state* induced by the positive words. However, given the method of affect induction used in this study, it could be suggested that the positive type of word might have been primed directly by the first set of words (positive words).

This interpretation of our findings is not compelling because direct priming of positive content cannot account for the pattern of responses obtained on the rating of unfamiliar and familiar words (the manipulation check), nor for the unusualness data. On the manipulation check, the same response pattern observed previously (Isen, 1983), after four different types of affect induction (pleasant film, funny film, free gift, and positive Velten statements), was observed again: improved rating of the unusual but not the familiar (in fact, a tendency in the opposite direction for the latter). This would be difficult to explain in terms of direct priming of positive words by the first 10 positive words. Moreover, direct priming of positive material would not account for the data showing an effect of positive affect on unusualness. As described above, the unusual responses of the positive-affect subjects did not appear to be simply an artifact of those subjects having given more positive responses. Thus, it seems that giving word associates to a group of 10 positive words is sufficient to induce positive affect, to produce response patterns similar to those obtained with a variety of other positive-affect inductions, and to influence the uniqueness of first associates given to neutral words.

Because the procedure of giving word associations to negative words produced no effect in our study, nothing definitive can be said with regard to negative affect. However, the failure of these words, rated as significantly more negative than neutral words, to have produced negative associates also argues against the direct priming interpretation for negative affect.

Study 2

As noted, it does not seem compelling that the results of Study 1 are attributable to direct priming of either positive or unusual responses by the affect-induction technique of word association to positive words. However, Study 2 addresses these issues directly by inducing positive affect in additional ways, by means of a comedy film or a free gift. Study 2 also examines subjects' word-associations to positive, negative, or neutral words, independently.

Method

Subjects. Undergraduate students ($N = 190$) enrolled in introductory psychology participated in this study, in partial fulfillment of a course requirement. Three subjects (one in each of three conditions), who responded to the word-association stimuli with complete sentences, phrases,

or the names of their girlfriends, were eliminated from the analysis.

Design. Subjects were randomly assigned to one of 12 experimental conditions created by the crossing of four affect conditions (two positive and two neutral) with three word-type conditions (positive, neutral, and negative words). Thus, the study contained 12 conditions, with 14–18 subjects in each condition, in a completely between-subjects design.

Materials. Two 5-min videotaped films were used to induce a positive or a neutral affective state in the film conditions. The positive film, "Gag Reel," consists of "bloopers" or humorous outtakes from several TV westerns. The neutral film, "Area Under a Curve," consists of a mathematical proof. Positive affect was induced, in a third condition by giving the subjects a small bag of candy (15 pieces of wrapped, hard candy in a sandwich bag decorated with cartoon characters (Glad "Funtime" Sandwich Bags) and tied with colored yarn). A no-manipulation control group was included in the study as a comparison group for this treatment. These affect-induction techniques had been used in previous research and found to induce the appropriate affective state (e.g., Isen, 1983; Isen & Daubman, 1984; Isen & Gorgoglione, 1983; Isen et al., 1984).

Booklets for the word-association task were constructed from the positive, negative, and neutral word lists used as the affect-inducing stimuli in Study 1, so as to create conditions in which subjects (in whom affect had been manipulated by film or candy) provided word associations to positive, negative, or neutral words only.

Procedure

Manipulation check. Subjects who viewed one of the films were given a blank sheet of paper and asked to write a few sentences about how the film made them feel. This task had been used previously as a means of manipulation check (e.g., Isen, 1983) and yielded results convergent with that of other means of evaluation of affective state (Isen & Gorgoglione, 1983).

Subjects were tested in groups ranging from 2 to 10 individuals by male and female research assistants. Two experimenters were present for each experimental session in which affect was induced by means of films. One was randomly chosen prior to the session to act as the experimenter; the other acted as someone who was there only to pretest the films, which ostensibly were to be used for affect manipulation in a different experiment. That experimenter briefly introduced the film and, after showing it, asked subjects to write several sentences on how the film made them feel. In these conditions, subjects were assured that the session would not run overtime. In the conditions in which affect was induced by means of candy, the experimenter gave subjects a small bag of candy of the type described above, explaining that it was a token of appreciation for their participation in the experiment. (Subjects were assured that, in addition, they would receive the expected credit for participation.) Subjects in the no-manipulation control condition received no affect manipulation before being introduced to the word-association task.

Word associations. The experimenter then randomly distributed the positive, neutral, and negative booklets containing 10 words, 1 per page. Subjects were instructed to write down their first associate to each word and to work at a relatively quick pace. When all subjects had completed their ratings, they were debriefed regarding the nature of the experimental hypotheses and affect manipulations.

Table 2
Study 2: Mean Number of Unusual First Associates to 10 Positive, Neutral, or Negative Words in Each of Four Affect Conditions

Valence of word	Affect condition: Positive film (comedy)	Control film (math)	Free gift	No manipulation
Positive				
M	5.79	4.88	5.00	5.37
s^2	(4.16)	(6.00)	(2.40)	(2.92)
n	14	17	16	16
Neutral				
M	5.41	3.80	4.40	2.93
s^2	(3.39)	(3.03)	(4.97)	(2.79)
n	17	15	15	15
Negative				
M	3.50	4.46	3.53	3.14
s^2	(3.46)	(7.29)	(2.28)	(5.95)
n	18	15	15	14

Note. Variances in parentheses.

Results

Manipulation check. Five additional introductory psychology students, who had not viewed the films and who were unaware of the nature of the experiment, rated the feelings conveyed by the sentences that subjects had written describing the way the film made them feel. A 7-point scale ranging from *very positive* (1), to *very negative* (7) was used. Judgments of the five raters were averaged. A comparison of the mean ratings in the two affect conditions indicated that the affective state of subjects viewing the positive film was significantly more positive than that of subjects viewing the neutral film ($M_{\text{Positive Film}} = 2.45$, $M_{\text{Neutral Film}} = 4.76$, $t(94) = 10.74$, $p < .01$). These results are consistent with those of other studies (Isen, 1983; Isen & Daubman, 1984; Isen & Gorgoglione, 1983) in suggesting that the positive film is a successful method of positive-affect induction.

Word associations. Table 2 contains the mean number of unusual first-associates to

negative, neutral, and positive words in each of the four conditions of the study. Because all three indices constructed for Study 1 yielded comparable results, only one of these (#2) was chosen for use in Study 2.

Two two-way analyses of variance (ANOVAS) intended to determine whether the two positive-affect conditions (positive film and candy) differed from each other and whether the two control conditions (neutral film and no-manipulation) differed from each other, indicated no main effect of induction method and no interactions (positive-affect conditions: $F(1, 89) = 1.67, .20 < p$; $F(2, 89) = .71, .20 < p$; control conditions: $F(1, 86) = 1.43, .20 < p$; $F(2, 86) = 1.51, .20 < p$, respectively). Thus, the positive-affect conditions were combined for further analysis, as were the control conditions; and all subsequent analyses treated affect as a variable composed of two levels (positive and neutral) rather than four.

Table 3 presents the mean number of unusual associates to each type of word, in each of these two affect conditions. A 2 × 3 (Affect Condition × Word Type) between-subjects ANOVA revealed a significant main effect of word type, $F(2, 181) = 10.26$, $p < .001$, and a significant interaction between word type and affect condition $F(2, 181) = 3.55$, $p < .05$. No main effect for the affect condition was found. Post hoc tests indicated that the main effect of word type was attributable to the positive-word conditions, but that the negative-word conditions, although their overall mean was lower than that of the control group, did not differ from the neutral, $t(123) = 2.96$, $p < .01$; $t(122) = 1.36$, $.2 < p$, respectively.

Paired comparisons performed in order to locate the source of the interaction effect indicated that induced positive affect and positive words as stimuli each produced significantly greater uniqueness scores relative to their comparison groups. That is, given neutral words (but not positive or negative) as the stimuli for association, persons in the positive-affect condition had significantly more unusual first associates than did those in the control group, $t(60) = 3.24$, $p < .01$; at the same time, subjects in the neutral-affect condition (but not those in the positive) gave more unusual responses to positive-word stimuli than to neutral or negative-word stimuli, $t(61) = 3.62$, $p < .01$; $t(60) = 2.12$, $p < .05$, respectively. Although the mean number of unusual associates to negative words was slightly higher than to neutral words in the neutral-affect condition, this difference was not reliable, $t(57) < 1$. Moreover, in the positive-affect condition, although the mean number of unusual responses to negative words was significantly lower than to neutral or positive words, $t(63) = 3.06$, $p < .01$, this mean was not significantly different from that of the neutral-affect, negative-word condition, $t(60) < 1$. Additionally, just as no difference was found between the affect groups when the stimuli were negative words, neither was any observed when they were positive words, $t(61) < 1$.

Table 3
Study 2: Mean Number of Unusual First Associates to Ten Positive, Neutral, or Negative Words in Two Affect Conditions

Valence of word	Affect condition: Positive affect	Affect condition: Neutral affect
Positive		
M	5.37	5.12
s^2	(3.28)	(4.41)
n	30	33
Neutral		
M	4.94	3.37
s^2	(4.24)	(2.99)
n	32	30
Negative		
M	3.51	3.83
s^2	(2.82)	(6.86)
n	33	29

Note. Positive affect includes the positive film and the free gift conditions combined. Neutral affect includes the control film and the no-manipulation control conditions combined.

Discussion

The results of Study 2 are compatible with those of Study 1 and of the Pilot Study in indicating that positive affect induced by two additional means (candy or comedy film), each unrelated to the word stimuli, results in an increase in the number of unusual word associations given in response to neutral stimuli. This extends the earlier work and

further discourages the alternative hypothesis that the effect is due to direct priming by the task of giving associations to positive words.

These converging results lend support to the suggestion that positive affect may influence the way in which cognitive material is organized. The findings of Studies 1 and 2 are compatible with the theoretical notion that positive affect results in a change in cognitive organization, characterized by increased breadth of concepts and increased perception of relatedness or integration of cognitive material. It follows that such a change in cognitive organization might result in a broader range of associates, because, if more things are seen as related, the pool of associates to a given word should be more wide-ranging.

Additionally, results of Study 2 show that among control subjects, positive words as stimuli also produced more unusual responses than did neutral words. This finding seems compatible with the results of two other types of studies on word association, viewed together: Those showing an effect of complexity of the associative context on associative uniqueness (i.e., that more unique associates are given in a more complex cognitive context); and those showing that positive words tend to have more associates (i.e., tend to have a more complex associative context) than other words (e.g., Cramer, 1968; Pollio, 1964).

It should be noted that, in contrast with other results reported in the word association literature (e.g., Cramer, 1965; 1968; Mandler & Parnes, 1957; see also Footnote 1), subjects' responses to the negative words used in Study 2 were not more unusual than their associates to the neutral words. This may be due to the measure of uniqueness that we used or to the fact that subjects responded to only one type of word (positive, negative, or neutral).

In measuring uniqueness in the present study, we referred to the Palermo and Jenkins (1964) norms and identified as "unusual" any response that was rare in that corpus. However, the normative data for positive and negative words in the corpus must themselves reflect any increase in uniqueness of responses that results from the affective tone of the words. Because in our present study we defined uniqueness in terms of a difference from the normative data, it is possible that an effect of word valence was obscured by the fact that such an effect was already present in the norming corpus. That is, conceptually, respondents in the normative study can be seen as equivalent to subjects in our control conditions; therefore, if positive or negative affective tone of words produces more unique or diverse associates, this should already be represented in the corpus, and the effect should be equal for the norming subjects and for our control subjects. Therefore, even if an effect of word valence on uniqueness does exist, one might expect not to observe it, if one uses a criterion based on obtaining a difference from responses present in the corpus of norms.

Indeed, we did observe such an effect of positive words, even with the measure that we used;[3] however, it still may be true that a criterion based on obtaining differences from the responses given by members of the norming sample may be too stringent. It may be the use of this stringent criterion that accounts for the failure of the negative words to produce more unusual associates than did neutral words in our study.

Thus, we constructed another index of uniqueness, one independent of the normative corpus and therefore perhaps more suitable for revealing an effect of the valence of the words. This index, the measure identified as "D" in the word association literature (e.g., Cramer, 1968), involves simply counting, across subjects, the number of *different* first associates given by our subjects to the stimulus words, without reference to the Palermo and Jenkins norms. This index should reveal an effect of positive or negative word valence if one is present. That is, if negative (or positive) words produce more diverse or unique responses than neutral words, and the effect

[3] This result indicates that the effect of positive words in our study was stronger than that observed in the norming sample used by Palermo & Jenkins (1964). It is possible that this is due to the fact that the words to which subjects responded in our study were of only one affective type, whereas in the norming study subjects gave associates to a mixed group of words.

was merely obscured when uniqueness was calculated using our norm-based index (because it was equally present in the Palermo and Jenkins corpus), then one should find, across control subjects, more different responses to negative (or positive) words than to neutral words.

Looking only at subjects in the neutral affect condition, we calculated these means (mean proportion of different responses per word, across the 10 words), for the three word types. This analysis revealed a difference between the neutral and the positive words, but not between the neutral and the negative words ($M_{Positive}$ = .57 (s^2 = .018), $M_{Neutral}$ = .46 (s^2 = .016), $M_{Negative}$ = .51 (s^2 = .023); $t(18) = 1.77$, $p < .05$; $t(18) < 1$, $.05 < p$, respectively). Thus, our data do not support the suggestion that negative words produce more diverse associates than neutral words. They do suggest that positive words produce more diverse associates.

General Discussion

In sum, then, results of the three studies presented in this article indicate that people in whom positive affect has been induced, relative to those in control conditions, tend to give more unusual first-associates to neutral words; additionally, associations to positive words appear to be more diverse than to neutral. These findings are compatible with the suggestion that positive affect influences the organization of cognitive material so that information is more integrated and patterns of associations are changed.

One possible alternative interpretation of these findings is that positive affect influences responding—that is, willingness to give the unusual response—rather than cognitive organization. Although such a factor may possibly play a role in the overall impact of affect on behavior, this interpretation of the present data is not compelling because of the interaction obtained between affect and word type. This interaction suggests that response bias was not the factor producing the observed results, because response bias presumably would affect all responding equally. Moreover, the present findings are compatible with a growing body of evidence from diverse studies (not subject to the response bias interpretation) that converge to suggest that cognitive organization is influenced by affect.

The interpretation that we wish to propose is that positive affect influences cognitive organization by altering the cognitive context in which cognitive activity takes place. Positive affect cues positive material (e.g., Isen et al., 1978), positive material is extensive and varied (e.g., Boucher & Osgood, 1969), and thus positive affect cues an extensive and varied set of material. Because context is known to influence cognitive organization as well as other processes (e.g., Tversky & Gati, 1978), we propose that positive affect can influence cognitive organization. Indeed evidence is beginning to confirm this possibility (e.g., Isen & Daubman, 1984).

The studies presented here provide additional evidence that cognitive organization may be influenced by positive affect.[4] They show that positive *words* elicit a broader range of associates (more unusual associates) and that a positive *state* results in a broader range of associates (more unusual associates) to neutral words. Not only does this suggest that positive affect may influence the way in which cognitive material is organized (i.e., the set of ideas that are cued by, or seen as related to, a given idea), but it also provides good evidence that the cognitive context accompanying positive affect is more complex than that present at other times.

There are two main points here: (a) that cognitive context is altered by positive affect—not just in the direction of positivity, but also in complexity; and (b) that cognitive organization may be altered by positive affect, possibly as a result of the complexity of the context—that the sets of relations perceived in cognitive material are altered. These two

[4] It should be noted (a) that we still have not studied cognitive organization directly; and (b) that the word-association paradigm currently is not in favor as a means of studying cognitive organization (in part because of the role that response factors may play in determining the results). However, the findings of these studies, especially when considered together with those indicating changes in categorization and memory as a function of positive affect (e.g., Isen, 1983; Isen & Daubman, 1984), lend support to the view that relations among cognitive elements may be altered by positive affect.

points have implications for many aspects of decision making and problem solving, and thus they suggest that positive affect may play an important role in these processes as well.

All of this suggests that cognitive processes may be more flexible as a function of positive affect. If a more complex context is present, if more material is cued, if more diverse ways of relating ideas to one another occur to people when they are happy, then their thinking may reflect this increased flexibility. Material may be multiply encoded and multiply retrievable. This may result in greater distractability and the possibility of errors at times (e.g., Isen et al., 1982); but it may also result in greater creativity, as has already been suggested (e.g., Isen et al., 1982; Isen, 1983). Preliminary evidence indicates that positive affect is associated with improved creative problem-solving ability; the present results, indicating increased unusualness of associations as a function of positive affect, may also be suggestive of a relation between positive affect and increased creativity; and this possibility is under further investigation.

The results that we have presented and described here—unusual or flexible responding as a function of positive affect—may seem surprising if one considers affect and arousal synonymous. This is because it is understood that arousal facilitates the dominant or typical response, not the unique (Zajonc, 1965). Indeed, there is even evidence that persons working in the presence of others (and therefore, presumably, aroused) give fewer unusual word associations than those working alone (Matlin & Zajonc, 1968). This would suggest specifically that arousal results in more common, rather than more unusual, word associations. This is exactly the opposite of the results that we have reported here for positive affect. Thus, perhaps positive affect and arousal should not be equated.

In this context it is important to examine the assumptions (a) that affect is equivalent to arousal, and (b) that positive and negative affect are equivalent in this regard. There has long been confusion between affect, especially negative affect (and most especially anxiety), and arousal. In fact, in the early part of this century, anxiety and arousal were often equated, in studies of both motivation and learning. One early view attempted to reduce all emotion to arousal (e.g., Duffy, 1934); but other views contrasted with that one even then (e.g., Leeper, 1948). And this kind of monolithic view of emotion (or even of arousal) has been questioned from several perspectives (e.g., Averill, 1982; Lacey, 1967; Lacey, Kagan, Lacey, & Moss, 1963; see Isen, 1984, and Isen & Hastorf, 1982, for more detailed consideration of this issue).

More recently and specifically, it has been noted that mild positive feeling states of the type induced in these studies do not seem to produce effects suggestive of global "arousal" (Isen & Daubman, 1984). Moreover, Mandler (1984), long a proponent of the role of arousal in emotion, has recently suggested that a distinction should be made between emotions and the more pervasive feeling states (or "moods") of the type induced in these studies, with regard to arousal. In fact, he has suggested that arousal is *not* a central component in mood states (Mandler, 1984, p. 277).

Although it is not possible to know for certain whether arousal is an important component of a mild positive feeling state, it seems that one should not simply assume that it is. Even less, then, would one be justified in assuming that arousal is all there is to positive affect of the type induced in these studies, and that the two are synonymous. This is especially so in view of the vagueness of the concept of "arousal" itself, the controversy that has surrounded its use in psychology, and, last but not least, the results like those presented here and elsewhere (e.g., Isen & Daubman, 1984; Isen et al., 1982) that are now suggesting that happiness may facilitate creative and unusual responding rather than the more routinized pattern of responding usually thought typical of "aroused" persons. Hopefully, future research will advance our understanding of affect and related concepts so that we can distinguish among them in determining their implications for thought and social behavior.

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