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Affect and Judgment

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ABSTRACT

Affect and Judgment

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Several experiments investigated how affect influences judgments-frequency estimates and product evaluations, and behavior-amount of beverage consumed.

Two experiments, adapting a paradigm from Johnson and Tversky (1983) examined the influence of affect induced by a story and cues provided by the context of experimental procedures on the frequency estimates of risks. The findings failed to replicate their results: negative affect did not increase all the estimates irrespective of their relation to the topic of the story. The estimation seems to have depended on the association with the story topic and on the cue conditions. In the third experiment, affect induced by a scare story about a beverage did not influence evaluation of all objects, rather its effect depended on the type of product evaluated. Even though the results were not readily interpretable, especially due to negative mood decreasing estimates of some risks in Experiments 1 and 2, and making ratings more favorable for some products in Experiment 3, the pattern of findings imply the following: 1) impact of mood seems to be dependent on the association between the cause of mood and the judged object, 2) the nature of this association may be something other than categorical proximity, and 3) contextual cues influence mood effects on judgments. It is argued that context dependent sources of activation and the process of refocusing will activate any portion of the

associative network of memory selectively, resulting in various different responses, and not necessarily a generalized, mood congruent response to the object of judgment.

Fourth experiment investigated whether pairing affective material, music, with a commercial influences product preferences. A subject in a negative state consumed more of the beverage and evaluated the taste less favorably than a subject in a positive state. This effect was only on one beverage with no spread to any other beverage. Demand characteristics and direct transfer of affect explanations are ruled out. The argument is that the results of all few studies are consistent with a memory based model of affect.

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Advisor

PREFACE

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CHAPTER I

INTRODUCTION

There are a number of pervasive marketing problems that are neither well studied nor understood. One such problem is product scares like McDonald's worms rumor (Tybout, Calder, and Sternthal, 1981) and the Tylenol scare. We do not know whether or when the negativity generated about product X will influence only that product or generalize to other products, such as Burger King or Anacin.

A similar problematic area arises with advertising issues such as ad placement, and emotion in advertising. How and when the mood created by a prior program segment, a prior commercial, or affective context of a commercial will influence the response to the critical message are questions that are not well understood.

The problems mentioned above have something in common: an emotional aspect. However, until recently there has not been much research interest in emotions. Consumer behavior studies have mostly relied on cognitive psychology which "has lived for several decades essentially without affect, attending to its narrower task of explaining 'cool' thinking" (Simon, 1982, p. 342). Such an approach may fail to provide sufficient explanation for marketing issues with emotional aspects. Investigation of affect will enhance understanding of such problems and the judgment process and behavior in general. For example, Abelson, et al. (1982) indicate that affective components are highly predictive of overall evaluations of political persons and add significant variance explanation over and above that due to judgments

of semantic components. In product evaluations, affective components may have a similar value, over and above product attribute evaluations. Therefore, research is needed on marketing problems which have emotional aspects. Furthermore, a theoretical framework is needed to enhance understanding of why and how affective states influence responses and hence to provide useful knowledge about managerial implications. This dissertation addresses the need for a basic understanding of how affect is processed and how it effects judgment.

The construct of interest is defined as "immediate affective state." Affect is used as a generic term here. One definition that is modified from Simon (1982) is: affect, emotion and moods designate states and processes in the cognitive system, autonomic nervous system and the endocrine system. Mood or feeling refer to affect that provides context for ongoing thought processes without noticeably interrupting them. This subtle affective state is the construct of interest here.

Although many affect researchers would agree upon this definition, it is by no means consensual. Affect has been a very difficult term to define. The literature abounds with different definitions of mood, emotion, feeling, affect, etc. (Averill, 1980; Izard, 1982; Kleinginna and Kleinginna, 1981; Mandler, 1975, 1982; Pribram, 1980; Rapaport, 1942; Royce and Diamond, 1980; Simon, 1982; Young, 1961). The difficulty of defining affect is due to the lack of a consistent theoretical framework.

To investigate the role of affective states on judgment, within a

theoretical framework, a number of questions need to be addressed:

-How are feeling states represented?

-What is the process by which affect influences judgment?

Some recent theoretical views have emerged in the last few years concerning these questions. These views pose a controversy which has roots in the previous approaches to the study of the nature of affect.

Two approaches are discussed below. One is the "common processes" view (Bower, 1981; Bower and Cohen, 1982; Clark and Isen, 1982). According to this view, affective and cognitive systems involve common processes, and are similarly represented in memory. Feeling states interact with and operate within the organization of thoughts. This approach argues that affective and cognitive systems are interdependent and provides a specification of how the two systems interact. Common processes view is consistent with what Zajonc, et al. (1982) refer to as the "cognitive" approach to emotions: affect is derived from interaction of physiological and cognitive processes. For example, Mandler (1975) argues that emotion involves arousal of the automatic nervous system and a meaning analysis. Arousal is nonspecific and undifferentiated; it sets the stage for emotional behavior and experience; and it determines the intensity and "bodily feel" of experience. Arousal demands interpretation and analysis of the environment by sensory and cognitive systems following autonomic activation. Thus, meaning analysis involves evaluative cognitions which provide the "mental" feel of emotions-their quality and subjective content. Arnold (1970) and Lazarus (1984) are among

the investigators who hold similar views. The cognitive view has mostly been influenced by Schachter and Singer's (1962) work and developments thereafter (see Lazarus, 1984 for a review).

Common processes view is based on "accessibility hypothesis": an affective state can function like an organizing unit as a cue to prime related cognitive material. This hypothesis implies that affective tone may be an important dimension of cognitive organization. Different models of accessibility, deriven from different models of memory (Collins and Loftus, 1975; Collins and Quillian, 1969; Smith, et al., 1974; Tversky, 1977) may provide explanations for how affect functions as a retrieval cue. A widely accepted model of accessibility is "spreading activation in an associative network."

According to the network model of memory, concepts are interconnected by associations. The associative network is a large connection of nodes, which are independent units. The spreading activation process, in the associative network, makes particular portions of the net selectively accessible for recall. When a concept is attended to, a node is stimulated. Activation spreads out along portions of the network associated with that node, in a decreasing gradient (Anderson and Bower, 1973; Collins and Loftus, 1975). Bower (1981) argues that some nodes in the net represent feeling tones.

Research evidence that feeling states can cue retrieval of material in memory linked to a feeling state is provided by a number of studies (Bower et al., 1978; Fisher and Marrow, 1934; Isen et al., 1978; Laird et al., 1982; Teasdale and Fogarty, 1979; Weingartner et

al., 1977; Wright and Mischel, 1982). For example, subjects who were feeling good after receiving a small gift were more positive in rating the performance of the products they owned (Isen, et al., 1978). One of the studies that provides the strongest support for the spreading activation notion is reported by Bower (1981). He found that recall was better when learning and testing occurred under the same emotional state than under different states. Retention is better if the original emotion experienced during learning is reinstated at the time of recall than if it is not. Mood reinstatement acts like a search clue that provides a differentiating context for learning. Bower argues that the summation of activation from both the learning context node and the emotion node lead to better recall than from only the context node.

Although this study offers support for the notion that affect is represented like cognitive structures, it does not provide direct support for the spreading activation hypothesis. Whereas Bower (1981) argues that *affect is a node in the associative network*, there is another way to view emotion that is prominent in the literature. It is termed "functional independence." According to this view affective and cognitive systems are represented differently, and affective states may be independent of cognitions (Zajonc, 1980; Zajonc and Marcus, 1982, 1984; Zajonc, Pietromonaco, and Bargh, 1982). The motor system can represent information independently of other forms of mental representations.

Functional independence approach represents what Zajonc, et al., (1982) and Izard (1982) refer to as the "somatic" view of emotions:

discretely different patterns of neurophysical activity, independent of cognitive appraisal, is capable of generating emotions. Emotion has three aspects: 1) bodily process-involves neurotransmitters, autonomic and somatic nervous sytem, 2) overt expression-involves motor (facial, postural, gestural, and vocal) expression, and 3) experiental, subjective feeling state. Izard (1984) and Leventhal (1979) are among the investigators who contributed to this view which is concerned more with the somatic expression of emotion, and which suggests that emotion is an experience which has immediate meaning for the person (i.e., subjective feeling).

Wilson (1979) offers impressive evidence for a functional independence view. With recognition reduced to chance level by a shadowing task, differential affective reaction to stimuli is obtained as a consequence of mere repeated exposure. He reports that melodies presented five times were liked better than melodies never heard, even though subjects could not discriminate the former from the latter for familiarity. Although this effect appears congenial to a functional independence position it should be noted that a compelling explanation for why familiarity or exposure increases preferences has not been provided: "We have never been sure why exposure has positive effects" (Zajonc and Marcus, 1982, p. 125).

It is the belief that the issue of interdependence versus independence of affect and cognition can best be approached by testing a particular theory. The predictions deriven from the explanation provided by the common process view, in particular the spreading

activation hypothesis, can be tested directly. Such studies grounded in theory will enhance the understanding of how affect is represented and of the process by which it influences judgment.

Research Objectives

How are the judgments people make when they are in a feeling state influenced by that state? Are all responses or only a subset of responses related to the cause of the mood biased by the feeling state? For example, when a student is happy because he got an A in an exam will he think that he will get an A in the next exam, evaluate the professor favorably, and like the lunch he eats after the exam? The research reported here investigates these questions. Each chapter is self-contained.

First, we need to understand the process by which affect influences judgment. The three studies presented in Chapter II represent attempts to examine this process. Specifically, the question of whether and when mood will influence all the judgments, even judgments unrelated to the cause of the mood or only the judgments associated with the cause of the mood is investigated. For example, why is it that people will think that more people will die from leukemia and a greater number of bankruptcies will occur when they read a story about leukemia? Are there some conditions under which they will not increase their bankruptcy estimates when they read a leukemia story? An explanation is suggested based on the modern spreading activation theory.

Chapter III examines whether or not some of the mood effects are

due to methodological artifacts. Demand characteristics is an important problem in affect research. Before we begin to explain a phenomenon we have to make sure that it exists beyond methodological artifacts. A study which addresses this issue is presented. This study also has implications for the adequacy of classical conditioning versus active cognitive processing explanations of the mood effect.

Chapter IV offers some concluding remarks on the role of affect in judgment. The basic premise is that people make a judgment by evaluating and integrating relevant information found during memory search. They use whatever information is available at the time of judgment as cues to estimation or evaluative judgment. Affect provides a cue for memory search and biases availability of whatever is retrieved. This chapter also offers some broader conceptual rationales for the present view, discusses difficulties in affect operationalization, limitations of the present studies, and suggestions for future research.

CHAPTER II

BEYOND SIMPLE NOTIONS OF SPREADING ACTIVATION AND EMOTION

Investigations of consequences of affective states have revealed effects on cognitive processes such as perception, memory, judgment and thinking (Bower and Cohen, 1982). Thinking and judgment are influenced by mood such that social judgments, imaginative constructions, snap judgments, probability estimates of future events, and risk estimates are affect congruent. Johnson and Tversky (1983) suggest that mood has a "global effect" and influences a wide variety of responses, even responses unrelated to the cause of the mood, in the task situation. The exploration of the global effect and the conditions that produce global or specific mood effects is an important set of issues for current research.

Recently, Johnson and Tversky (1983) addressed the question of whether mood effects are global or specific. Specific effect refers to the finding that for a subject in a particular mood because of event X, only a subset of responses (those related closely to event X) are influenced by the mood. Specific effects may occur in two forms: 1) local, only the response to an event or an object directly related to X is influenced; or 2) gradient, a set of related responses are influenced according to the degree of association between X and the response. Global effect refers to the finding that all the responses, unrelated and related to event X, are influenced by the mood. Johnson and Tversky (1983) argue that their finding, a global effect, poses a problem for memory models of affect that assume spreading activation

within an associative network. They suggest that according to the spreading activation view the impact of feeling experience should largely be determined by the strength of relationship between X and the response. Thus, they argue, a global mood effect, independent of the strength of association between the cause of the mood and the response, is at odds with the spreading activation view.

However, alternative interpretations seem to be plausible due to theoretical and methodological considerations which are discussed below. How far activation will spread depends on the parameters of the model such as strength of association. A careful reading of modern associative memory models (e.g., ACT*; Anderson, 1983) shows that the Johnson and Tversky conclusion is overstated. Global as well as specific effects are consistent with the spreading activation notion, and both effects can be obtained depending on the degree of activation and pattern of contextual cues.

The exploration of the global mood effect and the conditions that produce global specific effects have implications in terms of memory operation. If, as Johnson and Tversky argue, mood effects are independent of cognitive associations memory models of affect that assume spreading activation must be rejected. Before such a model is falsified the prevalence of the global effect and predictions of the model must be subjected to further testing. To make these predictions, the nature of interdependence of affect and cognitions must be specified. Investigation of the conditions which will lead to global versus specific mood effects will serve this purpose.

Therefore, the key research issues are: 1) whether Johnson and Tversky's findings on the impact of mood on judgments can be replicated, and 2) when global or specific mood effects are obtained. Three partial replications which attempted to address these issues are presented.

Review and Discussion of Global Mood Effect

Johnson and Tversky (1983) induced affect by having the subjects read a brief story about a tragic event within a questionnaire entitled "Newspaper Reporting Study." In the first of their four experiments, all subjects read two neutral filler stories and those in experimental groups read an additional story about death of a student due to fire, leukemia, or homicide. Subjects rated each story with respect to interest and quality of writing and indicated how the story made them feel on a mood scale that served as a manipulation check. Then the subjects were given a "Perception of Risk Questionnaire" containing the dependent measures. Subjects were provided an anchor point and asked to estimate the number of annual fatalities due to each of seventeen causes of death. The similarity among these risks was assessed preexperimentally. Each experimental condition involved a target risk (matching the story topic), near-target risks (two most similar to the story), and non-target risks (the remainder). Thus, stories represented a between subjects factor while the risks were a within subjects factor.

Their results revealed that subjects who read a negative story

gave higher risk estimates than the control group. They also compared ratios of experimental to control mean estimates for target, near-target, and non-target when matched and nonmatched by the story. Ratios for target or near-target risks were not larger when matched than nonmatched by the story. For example, reading a story about a person dying in a fire not only influenced estimates of deaths from fire but also estimates of deaths from nuclear accidents. Or, alternatively, estimates of deaths from fire were influenced by a fire story as well as a homicide story. These comparisons and ANOVA findings were interpreted to provide evidence for global mood effects in the absence of any specific effects.

Similar results were obtained in three follow-up studies conducted by Johnson and Tversky (see Table 1-A). In their second experiment a new task was added to induce a comparison among risks. The estimation task was also simplified by reducing the set of risks from seventeen to seven. In the third experiment they included a nonfatal depressing story and extended the list of estimates to comprise nonfatal life problems such as bankruptcy. In the fourth study, the experimental story was positive. In all of these studies, the experimental manipulation of affect induced by a story of a tragic (fortunate) event produced a pervasive increase (decrease) in respondents' estimates of frequency of risks. This effect was independent of the similarity between the story and the estimated risk. Therefore, they argue, mood effect is independent of the strength of association between the story and the risks, and memory based models may not be appropriate for affective states.

Lack of a specific effect does not necessarily imply that the impact of mood was independent of the strength of association between story and risks and does not necessarily contradict an associative network model. A widely accepted associative network model of memory and some of its mechanisms relevant to the current issue are reviewed briefly, followed by a discussion of the role of affect in the network and application of some of the spreading activation principles to mood effects in the Johnson and Tversky paradigm.

According to the network model of memory, concepts are interconnected by associations. The associative network is a large collection of nodes which are independent units. The spreading activation mechanism in the associative network renders particular portions of the net selectively accessible for recall. When a concept is attended to, a node is stimulated. Activation spreads out along portions of the network associated with the node, in decreasing gradient (Collins and Loftus, 1975; Bower, 1981). In a recent version of this theory (Anderson, 1983) spreading activation defines working memory. Activation flows from a source and induces levels of activation throughout the associative network. Spreading activation identifies and favors the processing of information most related to the immediate context or sources of activation. Various nodes or elements can become sources of activation with sources selected chiefly for two reasons. First, an element that encodes an environmental stimulus will become a source. Second, a "production" (an "if-then" procedure) can select "goal" element in a structure in working memory and goal

elements can also become sources of activation. Of course, a current goal element central to performing a currently important task serves as a source of activation. For example, the instructions of an experiment define a goal for the subject. Refocusing refers to identification of a relevant subnode and focusing activation on it. Retrieval process involves selecting a subnode of a concept for focus of activation and focusing on a subset of facts about that concept. Subjects may create an experimental subnode and use contextual associations to focus on it. The notion of goal as a source of activation as well as the mechanism of refocusing on subnodes enable Anderson's ACT* model to activate almost any portion of the network selectively. Thus, modern spreading activation models are consistent with many patterns of activation, both specific and global.

An illustration of how any portion of the network of information about risks may be activated is provided below. A familiar concept may have a hierarchical subnode structure that can be used to focus the retrieval process on a relatively small subset of facts known about that concept. For example, the concept "fatalities" may be conceived of as a general category with many different subnodes such as diseases, violent acts, hazards, etc., organized as a hierarchy (see Figure 1). Then, the goal of estimating fatalities activates the set of all events linked to the "Fatalities" node. Thoughts about various risky events or even abstractions about death will be activated in working memory. When the subject has to estimate frequency of a particular fatality such as "fire," activation refocuses on "fire" subnode. Then the

relatively small subset of nodes associated with that event will be retrieved and specific fire incidences will be in working memory. If both the goal element and the subnode are sources of activation (as is the case in the Johnson and Tversky paradigm), activation from both will sum and spread along portions of the network associated with both sources.

Bower and Cohen (1982) argue that "parsimony recommends the idea that emotional reactions to experiences should be stored along with nonemotional features in the same memory medium, according to the same storage principles, and retrieved by the same principles" (p. 307). They include feelings by incorporating emotion nodes and emotion interpretation (E-1) productions in a model similar to Anderson's ACT* model.

Some nodes in the associative network represent feeling tones. An aroused emotion spreads out activation, priming related concepts, words, and inference rules. An emotion becomes associated to coincident events and can later act like retrieval cue. Research evidence that feeling states can cue retrieval of material in memory is provided by a number of studies (Bower, et al., 1978; Fisher and Marrow, 1934; Isen, et al., 1978; Laird, et al., 1982; Teasdale and Fogarty, 1979; Weingartner,et al., 1977). One of the studies that provides the strongest support for the specific spreading activation notion is reported by Bower (1981) who found evidence for state-dependent retention. Recall was better when learning and testing occurred under the same emotional state than under different states. Retention was

better if the original emotion experienced during learning was reinstated at the time of recall than if it was not. Mood reinstatement acts as a retrieval cue that provides a differentiating context for learning. Bower argues that the summation of activation from both the learning context node and the emotion node lead to better recall than from only the context node.

E-I productions specify for a given cognitive interpretation an appropriate emotional appraisal. Whereas the knowledge involved in cognitive interpretation maps from external stimuli to an internal representation of the world, E-I rules map from these internal representations to emotional reactions. When an emotion node is activated, this activation primes E-I rules that are linked to feeling node into readiness for use in interpreting the next cognitive situation.

This approach would allow for either global or specific mood effects and is consistent with Johnson and Tversky's results. A homicide news story activates a "worry/sadness" node and a homicide node. Summed activation from both sources spread to all associated events. Not only "homicide" but also "fire" or "leukemia" nodes are associated with the feeling node (see Figure 1). Sources of activation need to be focused to be maintained active in the working memory (Anderson, 1983). Goal element and other contextual information or cues may refocus activation on a number of elements such as superordinate nodes or specific subnodes. Indicating how one feels on a mood scale focuses activation on the feeling node and thus maintains

it. Instructions to estimate deaths from numerous causes (i.e., a goal element) activate "fatalities" node and elements of this focused structure become sources of activation. Instructions to check for consistency of estimates force comparison across different fatalities and hence maintain reverberating activation from many subnodes. Estimating frequency of deaths due to a particular event, "fire," refocuses the goal element of "fatality" node and "fire" subnode, and elements of these structures become sources of activation. Relevant news and episodes are retrieved and a frequency estimate is made from this available sample. Frequency estimates of fire would be biased by what is in working memory: mood congruent fire episodes and fatal events including homicide. Also fire death thoughts send feedback excitation and reactivate feeling and fatality nodes which in turn influence later retrieval when the next event is to be estimated. As long as the links between homicide and other events are maintained active all events will be influenced by homicide story. Only if homicide-other event link is very weak (dissimilar or unrelated) or blocked or not focused on (e.g., if fatality and/or homicide nodes are not maintained active) and if the goal element is mainly refocused on fire, would specific effects be expected: homicide story would not bias fire estimates as much as homicide estimates. Hence, global as well as specific mood effects are consistent with the spreading activation mechanism because of context dependent sources of activation and the process of refocusing for further activation.

The role of degree of strength of the homicide-other event link

suggests that the limited span of risks and life problems might not have provided enough range for a fair test of spreading activation along a gradient. Even in Experiment 3, life problems may still be related to fatalities and are both undesirable events (see Figure 1). If a larger variance in the degree of association were provided (very unrelated events were estimated) specific mood effects could have been obtained. Besides, categorical similarity is only one type of relationship. There may have been many other types of associations, such as ambulance, police, and hospital, which are shared by homicide and fire, and activation may have spread to these nodes.

Methodological considerations may also introduce alternative explanations for Johnson and Tversky's findings. One problem pertains to an experimental demand explanation. If some intervention influences nontreatment variables as well as treatment variables, then a suspicion for demand emerges. Subjects might have been complying with the role behavior implicitly demanded by the mood induction rather than reacting to the intended intervention.*

A second problem is raised by Johnson and Tversky's methods of data analysis and reporting. Gradient effects can be revealed by larger increases for estimates according to their similarity to the story topic as well as large increases for near-target risks when they match the story. Comparison of target versus near-target versus

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*Johnson and Tversky report that their subjects acknowledged the effect of story on mood and the effect of mood on risk estimates even though they did not link the cause of mood to subsequent effect.

non-target risk estimates within a matching story condition (Analysis of variance of simple effects) would have provided a more powerful method of detecting gradient effects within an experimental condition than the correlational analysis performed. Eyeballing reported mean ratios it appears that target risk estimates were higher than near-target estimates for two matching stories in Experiment 1 and for three matching stories in Experiment 2 (see Table 1-B).

A particular result, the significant difference between matched versus nonmatched story conditions for homicide estimate (a local effect) in Experiment 2 is explained by evoking the greater effectiveness of the homicide story. If that were the case the same effect should have occurred (but did not) in Experiment 1.

A number of analyses, which would have been informative, are not reported for Experiment 3: story by risk interaction, comparisons for near-target risks, and charts of increases in estimates for both negative stories (rather than only one whose topic was not specified). Also, Johnson and Tversky indicated that "chronic depression" was the target risk for depressing story. "Divorce" or "unemployment" could also be considered as target risks since the story was about an ending relationship and job stress. A test of the specific effect would have been stronger if the event(s) that most closely matches the story topic is (are) treated as the target risk.

Finally, as implied in the discussion of the conceptual framework experimental procedures seem to have provided contextual cues that could have influenced the activation process and led to the global

effect. These priming cues are: 1) a question about feelings makes affect more salient and focuses activation on a larger subset of the network than in the absence of such a question; 2) presenting the target risk embedded among others, and 3) instructions to check responses for consistency activate the fatality structure due to reverberating activation among many subnodes. Hence, at the time of target risk estimation, thoughts available are not only due to the mood induction (for example, affect congruent homicide thoughts) but also due to activation of a larger set of fatality associations because of the above contextual cues. If these priming cues are removed and the mood induction is allowed to be the only cue, likelihood of a specific effect should be higher. Two studies were conducted to test this hypothesis.

Experiment 1

This study attempted to partially replicate Johnson and Tversky's first experiment. The influence of affective states and contextual cues on risk estimates is investigated. Story topic (neutral, homicide, leukemia), presence of mood ratings, and order or risks (Homicide or Leukemia first)* were varied in a 3x2x2 factorial design. The hypothesis was that a global effect would be obtained when mood question was asked and the target risk (Homicide or Leukemia) was presented in the middle of the list. A specific effect would be found

*When homicide risk is the first one to be estimated, there is no build-up cue for homicide estimate, but there is build-up cue for leukemia estimate, and vice versa.

when the mood scale was absent and the target risk was the first fatality to be estimated.

Sample and Procedure

Three hundred students in Northwestern's Graduate School of Management served as subjects. They filled out the questionnaires in a classroom setting. Individuals were randomly assigned to treatment conditions within each of twelve classes. The same materials and procedures as Johnson and Tversky were utilized except when the design called for a variation. The instruction to be consistent was omitted in all groups (see Table 2 for a comparison of the studies).

Manipulation Check

Comparison of means of two seven point mood scales for two filler stories in the control group versus for each of experimental stories revealed that homicide ($\bar{X}$=4.96)* and leukemia ($\bar{X}$=4.64) stories evoked more negative feelings than neutral stories ($\bar{X}$=2.9): $T(97)=13.07$, $P<.001$ and $T(96) = 11.75$, $P<.001$, respectively.

Results

A profile analysis treating risks as a within subjects factor (order of the risks was: homicide, near-homicide, other, near-leukemia, leukemia)** and the independent variables as a between

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*Larger numbers indicate more negative responses.

**Risks were grouped to follow up on Johnson and Tversky's conceptualization of similarity and "target," "near-target," and "non-target" classification.

subjects factor indicated a story by feeling question by risk interaction ($F(8,524) = 2.09$, $p=0.035$). This interaction implies that the influence of mood depends on the presence or absence of the mood scale and the type of risk to be estimated. To illustrate this interaction risk estimates across story and feeling question conditions are graphed in Figures 2-A and 2-B.

Estimates of each target risk, two closest ones (near-target) and the remainder (non-target) were analyzed. Homicide as target dependent variable was examined first. Means* and standard deviations are presented in Table 3-A. "War" and "terrorism" constituted near-target risks. MANOVA indicated the following effects: homicide story versus control: $F(4,261)=2.41$, $p=0.05$; negative story versus control: $F(4,261)=2.41$, $p=0.05$; negative story versus control: $F(4,261)=3.27$, $p=0.012$; and leukemia story versus homicide story by mood question: $F(4,261)=2.55$, $p=0.04$. ANOVA of homicide estimates revealed a story by mood question interaction: $F(2,264)=3.45$, $p=0.033$. In the homicide story condition higher target estimates were obtained when the mood question was absent ($\bar{X}=10.25$) than when it was present ($\bar{X}=9.68$): $F(1,264)=5.39$, $p=0.02$. Comparison of the target estimate across two

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*Frequency estimates were subjected to a logarithmic transformation (as Johnson and Tversky did) because they produced very skewed distributions. Hence, mean values are the means of logarithmic transformed estimates. Mean values of raw scores for homicide and leukemia estimates are presented in Tables 4-A and 4-B. Also, note that means here represent simple means of logarithmic estimates and not the ratio of experiment to control means that Johnson and Tversky report.

negative story conditions when feeling question was present indicated a reverse local effect: nonmatching story group ($\bar{X}$=10.21) gave higher homicide estimates than the matching story group ($\bar{X}$=9.68): $F(1,264)=4.09$, $p=0.044$.

Analysis of near-target estimates revealed a story main effect on "war" estimates ($F(2,264)=3.43$, $p=0.034$) such that negative story groups gave larger estimates ($\bar{X}$=4.59) than the control groups ($\bar{X}$=3.25): $F(1,264)=6.84$, $p=0.009$. This particular finding and the absence of a difference between matching versus nonmatching story conditions is consistent with what Johnson and Tversky would call a global effect. An interaction between leukemia story versus control story contrast and the mood question variable was obtained for "terrorism" estimates: $F(1,264)=3.89$, $p=0.05$.

Analysis of non-target risks indicated that the control group ($\bar{X}$=7.57) gave larger non-target estimates than homicide story group ($\bar{X}$=6.89) when mood scale was present and homicide risk was asked first: $F(1,264)=4.49$, $p=0.035$. There were no other main effects, interactions or simple effects.

Leukemia as target dependent variable was examined next. Means and standard deviations are presented in Table 3-B. "Lung cancer" and "stomach cancer" constituted near-target risks. MANOVA indicated the following effects: Leukemia story versus control by order by feeling question interaction: $F(4,261)=2.77$, $p=0.028$; and negative story versus control by order by feeling question interaction: $F(4,261)=2.67$, $p=0.033$. Analysis of target estimates revealed that control group gave

higher estimates ($\bar{X}$=9.52) than matching story group ($\bar{X}$=8.85) when mood scale was omitted: $F(1,264)=4.15$, $p=0.042$. Control group also gave higher estimates ($\bar{X}$=9.41) than nonmatching story group ($\bar{X}$=8.7) when homicide risk was presented first: $F(1,264)=4.25$, $p=0.04$.

Analysis of stomach cancer estimates revealed an order main effect ($F(1,264)=4.03$, $p=0.046$) such that giving a leukemia estimate first led to higher stomach cancer estimates ($\bar{X}$=8.9) than making a homicide estimate first ($\bar{X}$=8.5). A similar order effect was obtained for non-target* risks: higher estimates were given when leukemia was presented first ($\bar{X}$=6.85) than when homicide was presented first ($\bar{X}$=6.54): $F(1,264)=5.37$, $p=0.021$. There were no other main effects, interactions, or simple effects.

Analyses of each of the non-target risks separately revealed a story by mood question interaction for "nuclear accident" estimates ($F(2,264)=2.97$, $p=0.053$) and for "tornado" estimates ($F(2,264)=3.03$, $p=0.05$). Nuclear accident estimates were higher in the control groups when mood scale was present ($\bar{X}$=2.26) than when it was omitted ($\bar{X}$=1.11): $F(1,264)=4.28$, $p=0.04$. In the conditions where feeling question was omitted, negative story groups gave higher nuclear estimates ($\bar{X}$=2.14) than the control groups ($\bar{X}$=1.11): $F(1,264)=4.98$, $p=0.027$. In the conditions where feeling question was asked control groups ($\bar{X}$=6.08) gave larger tornado estimates than homicide story groups ($\bar{X}$=5.38):

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*"Non-target" here refers to the remainder of the risks after target and near-target for both leukemia and homicide targets were excluded; separate analyses of non-target risks of each target indicated similar results.

$F(1,264)=4.46$, $p=0.036$.

Discussion

It was expected that a global effect would be obtained when mood question was asked and the target risk was presented in the middle of the list whereas a specific effect would be found when the mood scale was omitted and the target risk was the first fatality to be estimated. This hypothesis implies an overall interaction between risks and the independent variables as well as an interaction among the independent variables when each target and near-target risk was analyzed separately. More specifically, both negative story groups should give higher target and near-target risk estimates than the control group when target risk was presented in the middle and a feeling question was asked; and matching story group should give higher target and near-target risk estimates than the nonmatching story group when target risk was presented first and the feeling question was omitted. On the other hand, a pervasive global effect prediction would imply story main effects in the absence of any interactions such that both negative story groups should give higher estimates than the control groups on all risks, in all feeling question and order of presentation conditions.

The results were neither consistent with the present predictions nor with Johnson and Tversky's findings. The presence of interactions implies that contextual cues such as build-up due to order of risks and presence of a mood scale appear to have some kind of influence on how

mood impacts estimates, but this influence was not interpretable.

If Johnson and Tversky are right, if mood effects are always global, whether the story topic matches the risk to be estimated or not should not make a difference in the estimate, under any of the contextual cue conditions. However, the match between the story and the risk does seem to make a difference, at least for one target risk-homicide estimates, in one condition-when a mood scale was present. However, this difference was in the opposite of the predicted direction. Differences in the predicted direction (i.e., specific effects), but not under predicted contextual cue conditions, were obtained in a post hoc analysis. A Scheffe procedure was employed to compare the largest target and near-target estimates for matching story group with the smallest ones for nonmatching story and control groups (see Table 5). Matching story versus neutral story comparison was significant only for near-homicide estimates. However, matching versus nonmatching story contrasts were significant for all target and near-target estimates. The latter comparison, for leukemia and near-homicide estimates, are of particular interest because they indicate a specific effect under exactly the same conditions (feeling question present and target risk embedded among others) as those where Johnson and Tversky found global effects.* These findings imply that their results were, at the least, not very robust. The impact of mood seems to be dependent on the relationship between the cause of the mood and the risk to be estimated in some cases.

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*These comparisons were initially tested with ANOVA a priori contrasts, but did not reach significance at $\alpha=.05$ level.

To enhance comparison between the present data and Johnson and Tversky's findings, a series of analyses that paralleled theirs were conducted. Unlike Johnson and Tversky's findings (Tables 1-A and 1-B), 1) comparison of ratios of experiment to control means of matching versus non-matching story groups does not indicate a global mood effect (Table 6); 2) neither story main effect nor experiment to control contrasts reach significance (Table 7); and 3) story by risk interaction is significant with a mixed-model ANOVA which appears to be the method Johnson and Tversky used (Table 7). Hence, the present data, analyzed by methods simulating Johnson and Tversky's do not yield similar findings.

It is particularly surprising that the study failed to replicate Johnson's and Tversky's results, because the materials and procedures were almost exactly the same as theirs (see Table 2). Besides, with the large sample size, the study had considerable amount of statistical power, at least as much power as Johnson and Tversky did. The variability was probably similar in both studies if not less for the present sample because management students could have been a more homogeneous group than "university students" who served as subjects in Johnson and Tversky's study.

Although there were some interesting findings suggestive of the existence of specific mood effects and the impact of contextual cues, the pattern of the results did not fit the present predictions either. Particularly puzzling was the finding that, in some cases, a neutral story led to higher estimates than a negative story. This generally

uninterpretable pattern of results suggested the possibility that the classroom context, in which the subjects were processed, might not have been conducive to thoughtful responses. The subjects might not have attended to the task, instead might have given haphazard responses. Therefore, the study was conducted again, processing subjects individually or in groups of two or three.

Experiment 2

One hundred and forty one students at Northwestern Graduate School of Management served as subjects. The design, materials, and procedures were exactly the same as those of the first study.

Manipulation check

Again the stories effectively induced a negative mood. Homicide ($\overline{X}$=5.95) and leukemia ($\overline{X}$=4.98) stories evoked more negative feelings than filler stories ($\overline{X}$=3.28); T(44)=11.41, p=0 and T(47)=7.56, p=0, respectively.

Results

A profile analysis treating grouped risks as a within subjects factor and the independent variables as between subjects factors indicated an interaction between risk and order of presentation ($F(4,126)=2.51$, $p=.045$ and a slight interaction of risk by story ($F(8,254)=1.90$, $p=.061$). These interactions imply that the influence of order of presentation and mood depend on type of risk to be estimated (see Figures 3-A and 3-B for illustrations).

The first target risk examined was homicide (see Table 8-A).* ANOVA of homicide estimates indicated a slight three-way interaction between homicide versus neutral story contrast and order and mood question: $F(1,129)=3.31$, $p=0.07$. When the mood scale was omitted and groups were collapsed over order, homicide estimates were larger in the control groups ($\bar{X}=9.97$) than in the nonmatching story groups ($\bar{X}=9.18$): $F(1,129)=3.83$, $p=0.052$. When leukemia risk was presented first and groups were collapsed over feeling question conditions, control groups ($\bar{X}=10.13$) gave slightly larger homicide estimates than leukemia groups ($\bar{X}=9.35$): $F(1,129)=3.59$, $p=0.06$. Analysis of simple effects revealed that estimates of homicide were higher for matching ($\bar{X}=10.12$) than nonmatching story group ($\bar{X}=8.97$) when there was a build-up cue (leukemia risk asked first) and mood scale was omitted: $F(1,129)=4.13$, $p=0.044$. This finding may be indicative of a local effect, however, the matching story group did not give higher estimates than the control group.

Analysis of near-homicide estimates indicated a homicide versus netural story contrast by feeling question interaction: $F(1,129)=3.75$, $p=0.055$ for terrorism estimates. When mood scale was omitted and groups were collapsed over order, near-homicide estimates were larger in the control group ($\bar{X}=6.29$) than in the matched story group ($\bar{X}=4.33$): $F(1,129)=5.74$, $p=0.018$. When there was no build up cue and groups were collapsed over feeling question conditions, control groups ($\bar{X}=6.05$) gave larger near-homicide estimates than the nonmatching story groups

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*See Tables 9-A and 9-B for means of raw scores.

($\bar{X}$=4.29): F(1,129)=4.65, p=0.033. Analysis of simple effects revealed a similar pattern when mood scale was omitted and there was no build-up cue: near-homicide estimates were larger if a subject read a neutral story ($\bar{X}$=7.15) than if he read either a homicide story ($\bar{X}$=3.97) or a leukemia story ($\bar{X}$=4.84) (F(1,129)=7.67), p=0.006) and F(1,129)=3.73), p=0.056, respectively).

An examination of non-target risk estimates, when mood scale was omitted and groups were collapsed over order conditions, indicated higher estimates in the control group ($\bar{X}$=7.55) than in the homicide story group ($\bar{X}$=6.75): F(1,129)=6.03, p=0.015.

The next target risk examined was leukemia (see Table 8-B). ANOVA indicated a main effect of order on leukemia estimates (F(1,129)=5.56, p=0.02 such that higher estimates were given when leukemia was asked first ($\bar{X}$=9.38) than when homicide was asked first ($\bar{X}$=8.74). There was an interaction between homicide versus leukemia story contrast and order: F(1,129)=3.72, p=0.056. When there was no build-up cue and when groups were collapsed over feeling question conditions, there was a reverse local effect such that leukemia estimates were larger in nonmatching ($\bar{X}$=9.91) than in matching ($\bar{X}$=8.74) story groups: F(1,129)=5.95, p=0.016. In the presence of feeling question, and when leukemia was asked first, there was a similar simple story effect on leukemia estimates: F(1,129)=4.54, p=0.035. Within homicide story condition there was an order effect such that when there was no build-up ($\bar{X}$=9.91) leukemia estimates were larger than when there was build-up ($\bar{X}$=8.70): F(1,129)=6.13, p=0.015. When feeling question was asked

there was a similar order effect within neutral story group: $F(1,129)=4.86$, $p=0.029$.

Analysis of stomach cancer estimates indicated an interaction between homicide versus neutral story contrast and mood question: $F(1,129)=4.44$, $p=0.037$. When homicide risk was presented first and mood scale was omitted, higher stomach cancer estimates were obtained in the control group ($\bar{X}=9.4$) than in the homicide story group ($\bar{X}=7.9$): $F(1,129)=5.1$, $p=0.026$.

A priori ANOVA contrast of homicide story versus control groups revealed that if a subject read the neutral story s/he gave higher non-target estimates ($\bar{X}=6.89$) that if s/he read the homicide story ($\bar{X}=6.33$): $F(1,129)=4.93$, $p=0.028$.

Discussion

Again, the above results and analyses reported in Tables 6 and 7 indicate that the study failed to replicate Johnson and Tversky's findings. Even though there were a few suggestions that contextual cues influence risk estimates (order effect on leukemia estimates), and also impacts mood effects (interactions between story and other independent variables), these influences were not always interpretable. In two conditions, the match between story topic and risk made a difference on the risk estimates: 1) a reverse local effect of story on leukemia estimates was obtained when there was no build-up cue due to order of presentation; and 2) a local effect of story on homicide estimates was obtained when there was build-up cue and when mood scale was

omitted. However, these are not "proper" local effects because the respective negative stories did not lead to higher estimates than the neutral stories. The puzzling finding of the first experiment reappeared: a negative mood did not increase risk estimates in comparison to a control group; on the contrary, in some cases control groups gave larger estimates than the experimental groups. Thus, although there were some very intriguing findings they were neither consistent with global nor with specific effects and were generally uninterpretable.

General Discussion

The two studies suggest that Johnson and Tversky's findings were not very robust. Global effects were not obtained except for one particular finding in the first experiment that was consistent with a global effect. Some of the interactions and simple effects allude to the impact of contextual cues on how mood influences judgments, however, the current predictions were not confirmed.

One pattern that complicated the results and reduced interpretability of the findings was that in some cases the control groups gave higher risk estimates than the experimental groups even though manipulation checks confirmed the mood induction. This finding points to the plausibility of a controlled reaction on the part of the subjects. This controlled reaction may be due to one of two reasons: 1) A reverse demand artifact (reactance)-Awareness of the mood may make the subject consciously control his responses and not to allow himself be biased by the negative mood, and 2) "Controlled processes" a la

Clark and Isen (1982)-They suggest that people use automatic and controlled processes to deal with emotional states. A negative state is undesirable. Hence people in negative states may use controlled strategies to block or attenuate the effects of automatic processes.

Clark and Isen suggest that automatic processes can be viewed in the context of spreading activation model of memory. They argue that controlled processes are more effortful processes a person unintentionally uses to alleviate a negative state. Controlled processes can also be viewed to be consistent with the recent version of spreading activation in the ACT model (Anderson, 1983). If we assume that blocking a negative state is a goal, this goal, like any other goal element, will be a source of activation. Then a node related to this goal may be selected and activation may be refocused on a portion of the network (for example, instances where people were saved in a fire) making goal relevant thoughts available.

Even though the results do not support a particular specification of how affective states operate, it is clear that memory-based models cannot be ruled out. To pursue the question of whether activation from a feeling node spreads along portions of the network of associations with that node, in a decreasing gradient, another study was undertaken. The purpose was to conceptually replicate Johnson and Tversky's study. A different paradigm was employed to avoid some of the problems, inherited from theirs, which might have contributed to the uninterpretability of the findings. To simplify the design, the issue of contextual cues was not addressed.

Experiment 3

This study investigated the influence of affective states on judgments about products. The stimuli and measurement were designed to alleviate three problems of the previous paradigm: 1) Numerous products were chosen to provide a wide range of associations for a fair test of the gradient hypothesis, 2) To reduce demand, cover stories attempted to conceal the relationship between mood induction and judgment task, and 3) To eliminate high within group variance that existed in risk perception and thus to improve statistical power, scaled measurements were used.

To induce affect, brief stories about lethal effects of a toxic residue in a specific beverage were constructed. Three possible effects of exposure to a mood-evoking story on evaluations of various products were considered: compared to control group baseline, 1) a local decrease, 2) a generalization gradient, and 3) a global decrease.

Stimuli

Stories

The affective stories were written and pretested to be credible and worry/fear provoking. To maintain information content constant, the stories were exactly the same except for the product they referred to: bottled orange juice or wine. The neutral story was about test marketing for Citrus Hill orange juice; it had appeared in Advertising Age. All stories were about the same length, were type-set, and presented as if they were clipped from a newspaper.

The set of products

Four groups of products were chosen to tap different associations with the target beverage. One set includes objects of different similarity with, and in the same category as orange juice and wine, namely six beverages. Bottled orange juice, grapefruit juice, instant coffee, bottled cola, beer and wine were the beverages selected based on the results of cluster analysis and multidimensional scaling performed on beverage similarity data. Evaluation of beverages of differing degrees of proximity provided a test of the gradient notion within the object category.

However, category relationship is not the only type of association that may be retrieved. Thoughts evoked by the story may also be associated with nonbeverages. The second set of products included nine foods that either were ingredients of or complemented orange juice or wine.

The third set included four products that had no cognitive association to the target beverages but had an emotional relationship, i.e., they were products (such as household insecticide) that make people worried. The fourth set of fillers were completely unrelated to the target beverages.

Sample

Forty five students at Northwestern's Graduate School of Management served as subjects. They were paid $5.00, each, for their participation. They were processed individually or in groups of two or three. There were approximately equal number of males and females in

each experimental condition.

Design and Procedure

When the subjects arrived at the laboratory they were told that they would participate in two surveys: one conducted for a newspaper to investigate readership and interest in different types of journalism, and the second to find out product opinions as a part of a market research. These instructions were intended to reduce demand characteristics.

Subjects were given a questionnaire entitled "Newspaper Reporting Study." Affect manipulation was introduced by varying the story subjects read in this questionnaire. Subjects were randomly assigned to one of the three story conditions: fear evoking story about orange juice or wine and neutral story. The questionnaire also included filler questions about readership (presented before the story) and story ratings with respect to interest and quality of writing. Subjects indicated how involved the story makes the reader (not at all: 1/very: 7), and were asked to list five adjectives to describe how the story made the reader feel. The last two questions served as manipulation checks.

Following the completion of this questionnaire, subjects were presented with a second questionnaire entitled "Marketing Research Survey," containing the dependent measures. Participants were asked to evaluate each of the randomly ordered products on five seven-point semantic differential items: good/bad, reputable/disreputable,

valuable/worthless, pleasant/unpleasant, something I would be willing/unwilling to buy. Finally, subjects indicated their gender and frequency of target beverage usage (never (0)/everyday (4)).

Thus, the experiment involved two independent variables: affect (between-subjects factor) and degree of proximity of products (within-subjects factor). Fifteen participants were assigned randomly to each of the three story conditions. Product evaluation served as the dependent variable.

Manipulation check

The adjectives listed to describe feelings were classified by a scheme generated from Plutchik's (1970) categorization of emotions. Once they were coded, the number of adjectives indicative of fear, worry, and apprehension were recorded. χ^2 tests indicated that experimental groups listed more fear/worry adjectives than the control group. 26.7%/86.7% of the subjects who read the orange juice scare story and 40%/73.3% of those who read the wine scare story indicated that they felt afraid/concerned or apprehensive whereas nobody/6.7% of those in the control group felt so: $\chi^2(2)=7.2$, $p=0.03$/$\chi^2(2)=22.3$, $p=0.0$. Control subjects mostly responded with adjectives like informed, aware, indifferent, and bored.

T-tests indicated that subjects who read orange juice scare and wine scare stories felt more involved ($\overline{X}=5.07$ and 5.00, respectively) than the control group ($\overline{X}=3.07$): $T(28)=4.19$, $p=0.0$, and $T(28)=3.85$, $p=0.001$, respectively.

Thus, the number of fear/worry adjectives and the responses given to the involvement question revealed that the stories effectively induced the intended emotion.

Results

Affective state did not have any effect on the evaluations of three sets of products: foods, emotionally related objects, or fillers. Hence, analyses of their ratings will not be discussed.

Principal components factor analysis with varimax rotation were performed on the five evaluative items for each beverage. These analyses indicated the items loaded on a single factor, which we shall refer to as evaluation, for four beverages and on two factors for two beverages (grapefruit juice and cola). The evaluative scales, composed of five items for each beverage, were reliable (Cronbach's α's were 0.79, 0.80, 0.80, 0.88, 0.89, 0.92). Mean of each subject's response on the five items was used as an evaluation score.* Means and standard deviations of evaluative scores of each beverage, categorized by treatments, are shown in Table 10, and a plot of means is presented in Figure 4.

A profile analysis treating beverage evaluations as an ordered within-subjects factor and type of story as between-subjects factor indicated a multivariate interaction between beverages and story:

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*This was done for all products, even for grapefruit juice and cola because the reliability of the scales of all five items were reasonably high (Cronbach's α=0.80 and 0.79, respectively), even though these items loaded on two factors.

$F(10,78)=1.84$, $p=0.068$/$F(10,210)=2.37$, $p=0.01$, with averaged test of significance using sequential sums of squares. This analysis suggested that affective state induced by a story did not influence ratings of all the objects, rather its effect depended on the type of beverage evaluated.

Separate analyses of variance of beverage evaluations revealed story effects only for grapefruit juice ($F(2,42)=4.29$, $p=0.02$) and coffee ($F(2,42)=4.51$, $p=0.017$). A priori contrasts indicated that subjects who had read either an orange juice scare or a wine scare story rated grapefruit juice more favorably than the control group: $F(1,42)=8.02$, $p=0.007$; and $F(1,42)=4.26$, $p=0.045$, respectively. Coffee evaluations were more positive in the wine scare story condition than either orange juice scare story ($F(1,42)=4.21$, $p=0.046$) or control ($F(1,42)=8.56$, $p=0.006$) groups. Thus, a respondent worried about wine evaluated grapefruit juice and coffee more favorably, and one worried about orange juice rated grapefruit more positively than a control subject.

Individual differences in consumption habits for the beverage in the story may mediate subjects' evaluative responses. Hence, frequency of drinking the target beverage was used as a covariate. Analysis of covariance did not significantly change the results for the beverage evaluations except for wine.* Hence, analyses of the other dependent

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*Another exception was grapefruit juice: the α level for the wine scare story versus control group contrast was now higher ($F(1,41)=3.64$, $p=0.063$) than $p=0.045$ reported above.

variables will not be discussed. When the effect of frequency of consumption of the beverage in the story a subject read was partialled out,* a story main effect was obtained on wine evaluations: $F(2,41)=3.97$, $p=0.027$. A priori contrasts indicated that subjects who read a wine scare story rated wine less favorably (adjusted $\overline{X}=3.17$) than the control group (adjusted $\overline{X}=2.0$): $F(1,41)=7.62$, $p=0.009$. Thus, when the effect of individual differences in consumption habits on wine ratings was removed statistically, a subject feeling apprehension towards wine (having read a wine scare story) evaluated wine less favorably than a respondent in a neutral state. This finding suggests a local mood effect.

Discussion

This study failed to replicate Johnson and Tversky: a global effect was not obtained. Mood induction did not affect all the responses of a subject indiscriminately; evaluations of only three products that were in the same category as the target object were influenced. Category membership implies cognitive relationships. Thus, the results suggest that mood effects were somehow dependent on the association between the responses and the cause of the affective

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*To check whether consumption habits could be used as covariate, 1) the correlation between the covariate and wine ratings, and 2) the interaction between the covariate and the treatment were examined. There was a statistically significant correlation ($r=-0.34$, $p=0.012$) between frequency of drinking the target beverage and wine evaluations, such that the greater the consumption, the more favorably wine was rated. There was no interaction between the type of story and the covariate in the analysis of wine ratings.

state. The existence of a story by beverage interaction supports this suggestion too.

The findings that the treatment influenced evaluations of only three products, and that of those three two were in the opposite of the expected direction, rule out a demand explanation.

However, the overall pattern of the results, two of them in particular, were again puzzling, and did not fit the present predictions. First, if an affective state influences judgments at all, it should at least have an impact on the responses towards the target object. However, a local effect was obtained only for wine but not for orange juice ratings. Orange juice is a product towards which there are strong positive attitudes. In another study very favorable evaluations were detected; some subjects even described it as an "all American drink." Well entrenched positive prior conceptions about an object would imply very few and weakly linked or no negative thoughts stored about that object. Then retrieval primed by a temporary and immediate negative affective state could not have made any mood congruent associations (i.e., negative orange juice thoughts) available. Hence, it appears that the strength of orange juice attitudes might not have provided enough power for detection of mood effects.

Second, if activation from emotion and object nodes spreads along the network in a gradient, affective state should influence judgments about beverages closely related to the target. According to Johnson and Tversky, relationship between an object and the target refers to similarity or categorical proximity. If structural proximity were the

association which carried activation, orange juice scare/wine scare story should have made grapefruit juice/beer ratings less favorable than a neutral story. However, beer evaluations were not affected at all, orange juice scare story made grapefruit juice evaluations more favorable, and wine scare story made coffee (and also grapefruit juice, when individual differences in consumption habits were not taken into account) ratings more positive. These findings suggest that mood effect is dependent on relationship between the target and the evaluated object, but that 1) the nature of this relationship may be something other than categorical proximity, and 2) spreading activation may not necessarily result in a generalized, mood congruent response to the associated object.

Characteristics of grapefruit juice and coffee suggest two types of association between the target and the evaluated object. One possible relationship may be that of substitutability. Even though coffee was not the closest beverage to wine in pre-experimental similarity analyses, it may still be considered to be a substitute.* Then the argument would be that the substitute would be preferred if the target beverage was rated negatively. This interpretation is based on the findings of the covariance analysis. An alternative interpretation is also plausible (especially if the ANOVA results are emphasized). The data indicated that grapefruit juice and coffee were

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*Both are mature, adult drinks that have an acquired taste (Levy, 1984).

the beverages most negatively rated by the control group. A post hoc comparison, using Scheffe 0.95 confidence interval revealed that evaluations of these drinks were less favorable than the aggregated ratings of the other beverages. Thus, the relationship may be evaluative similarity to affect congruent target object thoughts. Then the subject might deliberately disregard, for example, bitter taste, and consider relative benefits of coffee over lethal wine.

The above notions would be consistent with the spreading activation view discussed previously. Controlled processes with the goal of alleviating a negative state can account for the findings. Being worried about wine may make instant coffee ratings more favorable because goal-oriented nodes may be selected to refocus activation. For example, in contrast to lethal wine, positive attributes of coffee may be focused on making goal relevant (i.e., positive) thoughts available. Hence, the unexpected pattern of findings appear to be compatible with the conceptualization discussed here.

Neither pervasive global nor pervasive specific effects were obtained in the three experiments. The results seem to be consistent with a memory-based model of affect. However, the findings suggest a more complicated process than was predicted. Further studies are needed to provide stronger tests of the spreading activation mechanism. Future research should manipulate goals and refocusing to create conditions under which specific versus global effects would be obtained.

CHAPTER III

THE INFLUENCE OF CONTEXTUAL AFFECTIVE STATE ON PRODUCT PREFERENCES

A variety of contextual factors such as humor, music, and pleasant pictures are often used in advertising or in consumption situations. Contextual factors that are in some way paired with the product presentation usually create an immediate and temporary affective state or a "mood." The premise is that the mood created by these devices influences product perceptions, preferences, and choices.

Some research germane to the role of affect is offered in the recent literature (Allen and Madden, 1983, 1984; Gorn, 1982; Kroeber-Riel, 1984, and Mitchell and Olson, 1981). This inquiry indicates that pairing affective material with the ad influences product preference. In other words, message execution tactics such as music, humor or pleasant pictures lead to positive sentiments about the brand.

A critical discussion of this literature, which is presented below, identifies a number of methodological problems with the existing investigations. It is suggested that whether or not the pairing effect exists in the absence of methodological artifacts seems to be uncertain. The present study addresses the question of whether the pairing effect is merely due to methodological artifacts or affect. An experiment that attempts to eliminate these artifacts is reported.

Contextual Affect in Advertising: A Review and Critique

The role of affect in advertising has been investigated by a

number of researchers examining "attitude towards the ad"-a construct thought to capture affective reactions to the ad. Mitchell and Olson (1981) manipulated ad content by constructing four different ads for a hypothetical brand of facial tissues. One ad contained only a verbal product claim, each of the other ads contained a picture with a headline. Two of the pictures were assumed to be positively evaluated, and the third was assumed to be neutral. Subjects were exposed on multiple occasions to all four ads. Then the subjects responded to a questionnaire that included attitude towards the ad as well as attitudes toward the brand and purchase intention items. The investigators report that attitude towards the ad as well as product attribute beliefs determine brand attitudes and purchase intentions. They suggest that effects of advertising may be mediated by an individual's affective reactions to the ad.

Other studies in this line of research (see Table 11) also support the notion that when cognitive responses to the brand and modifications in the cognitive structure are statistically controlled, affective reactions to the ad account for significant amount of variance in brand attitudes, at least in low involvement situations (Park and Young, 1983), or at least in terms of its immediate and direct effects (Moore and Hutchinson, 1983). This empirical finding has generally been explained in terms of classical conditioning.

However, these studies share some conceptual and methodological problems. A number of researchers note that attitude towards the ad may have many dimensions or antecedents one of which is pure affect or

mood (Allen and Madden, 1983; Lutz, 1983; Shimp, 1981). There seems to be lack of evidence for the construct validity of ad affect. Threats to construct validity of affect in Mitchell and Olson's study are discussed below, and Table 11 lists the problems shared by the other studies: 1) Affect was not the only factor that varied across different ads because of the concurrent pictorial and visual ad content manipulation; 2) repeated treatment design: a subject, noticing different ads, may respond to a perceived hypothesis about the purpose of the study. Such a design also invites a confound of effects of treatment with the effects of the context of or interaction of several treatments (Cook and Campbell, 1979); 3) procedures that enhance demand characteristics: subjects were told that they would be evaluating the ads. This instruction may have sensitized them to comparing different ads, and thus they may have attempted to find ad differences as a basis for their evaluation. Furthermore, when the subject is first asked to evaluate the ad and then the brand, his evaluation of the brand may reflect a tendency to give consistent responses or a compliance with the perceived demands of the situation.

Most of the ad affect studies (see Table 11) used designs that are not sufficient for permitting strong tests of causal hypotheses because they fail to rule out a number of plausible alternative interpretations (see Cook and Campbell, 1979 for a discussion of the problems with these designs). Selection, testing, and particularly post hoc measurement of ad affect pose further limitations. When the independent variable is not experimentally manipulated causality inferences are

precluded. A post hoc measurement lends itself only to correlational analysis.

The above discussion suggests that the variance in attitudinal measures may have been due to factors other than ad affect. Hence, purely affective and experimental manipulations of the ad affect construct is needed. The study reported by Gorn (1982) is of special importance because it is the first attempt to address this concern.

Gorn (1982) examined how music, a background feature in advertisements, affects advertising effectiveness. Subjects viewed a slide of either a light blue or a beige pen (the colors were found to be neutral in a pretest) while they listened to a one minute segment of either pleasant or unpleasant music. The dependent variable was choice of a pen as a reward of participation. The color paired with pleasant music was chosen more frequently than the color paired with unpleasant music.

In a follow-up experiment, each subject viewed a musical ad and a nonmusical descriptive ad. The subjects who were uninformed that they would be making a pen selection decision more often chose the pen color associated with pleasant music than the color paired with descriptive ad. However, the subjects who were informed that they would be making a pen selection decision chose the pen color associated with the descriptive ad more often than the color paired with pleasant music. These results were interpreted as indicating that classical conditioning of behavioral preference occurs under nondecision making contexts, and that active informational process occurs in decision making contexts.

Other investigators reported results which were inconsistent with Gorn's pairing effect. Allen and Madden (1984) used humor instead of music in an attempt that failed to replicate Gorn's findings. They found that the pleasantness of humor did not influence choice behavior.* Srull (1983) evoked mood by instructions to recollect happy or sad instances from one's life. He failed to find any significant differences in either recall or product evaluation between the subjects who read a descriptive print ad while in a positive mood versus those who read the ad while in a negative mood (Experiments 1 and 2). However, it can be argued that the null effects found by Srull (1983) and Allen and Madden (1984) may be due to lack of statistical power or weak manipulation of affect.**

Contradictory empirical evidence about the pairing effect implies the need for a more detailed examination of Gorn's study. First, Gorn's results cannot readily be interpreted to indicate classical conditioning because other explanations are viable. If awareness of experimental contingencies is present in a study, then there are two alternative explanations for the empirical findings: 1) contingency awareness may allow subjects to make inferences about experimenter's purposes and respondents may comply with perceived demands of the

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*However, a different dependent variable-willingness to sell back the pen was influenced by humor manipulation. The authors argue that their findings contradict a classical conditioning process.

**Srull (1983) did not report any manipulation checks. Allen and Madden (1984) reported that affect manipulation was effective, but effect size might not have been large enough.

situation (Fishbein and Ajzen, 1975), 2) subjects may engage in "higher mental processes" (Brewer, 1974) or form beliefs (Fishbein and Ajzen, 1975). Gorn's subjects are very likely to be aware of the commercial-music pairing because 1) in the first experiment they were told that their task was to help an advertising agency select music to use in a commercial, and they were instructed to attend to music, and 2) in Experiment 2 subjects were told that one ad was musically based and the other one attribute based.

Now consider the possibility that subjects are engaging in "higher mental processes" and making active associations between the stimuli. The instructions in Experiment 1 make music salient. There is ample time to elaborate on thoughts evoked by the stimuli-pen and music since there is one minute to view a very simple slide. A familiar and liked song has a rich network of pleasant thoughts associated with it and this network is retrieved. Activation from positive affective state primes positive thoughts from among the total set of pen thoughts in the memory (Bower, 1981). A decision such as pen choice depends on the nature of the thoughts available. Therefore, a subject is more likely to select the pen about which s/he has positive versus negative thoughts available, and also as compared to one about which s/he has very few and mixed thoughts available as in the case of the unadvertised pen.

The findings of Experiment 2 can also be interpreted similarly. The descriptive attribute information, which otherwise is very dull, is made salient to the subjects who were informed of a forthcoming pen

choice decision. Hence, the positive attribute information becomes the critical retrieval cue for those subjects. For the subjects not informed of forthcoming pen selection neither the verbal information nor music is made salient through instructions. It can be argued that a popular song is inherently more salient than boring statements, and, in the absence of another priming cue, becomes operative. Again, the pen choice depends on the availability of positive thoughts retrieved by the critical cue. Hence, an alternative explanation-active cognitive processing, which relies on the availability of thoughts retrieved by the affective state, seems to be at least as plausible as a classical conditioning one.

Next, consider the second possible consequence of awareness-demand characteristics and methodological artifacts in general as alternative explanations of the pairing effect. Some of Gorn's procedures suggest plausible rival explanations for his findings. Selection bias (Experiments 1 and 2) and diffusion of treatments (Experiment 1) are two possible threats to internal validity. Individuals were not randomly assigned to treatment groups, class sections were. This procedure may preclude probabilistic equivalence across groups. Class differences may confound treatment effects. The subjects of the first experiment were processed sequentially. Half of the class took a break while the other half participated in the study. Communicating with those who participated or overhearing music could have sensitized the subjects and influenced their treatment reception. Respondents in the second half of the class could have guessed the experimental hypothesis.

There are also several threats to the construct validity of Gorn's findings. First two refer to Gorn's second experiment and are similar to previously discussed problems: 1) interaction of different treatments; 2) confounding affect manipulation with the amount of information provided in the ads; and 3) demand characteristics (Experiments 1 and 2)-each treatment condition was run when the subjects were in the classroom. Students could have interacted while in such large groups. A few hypothesis guessers interacting with others within the same experimental group could have contaminated the results. This is particularly germane in the negative affect treatment group in Experiment 1. Indian music is not a common background music in commercials. Therefore, subjects who heard the Indian music could have been suspicious about the purpose of the study. This possibility, coupled with the fact that there was no control group to provide a baseline for choice behavior in the absence of positive or negative affect may render the findings for the pleasant music group uninterpretable, i.e., the subjects could have chosen the pen color they had seen in the ad more often than chance level due to either exposure or affect.

All of the above threats pose alternative hypotheses about the observed difference in choice behavior other than pairing with contextual affect. Hence, the issue of whether or not the pairing effect exists beyond methodological artifacts needs to be pursued further.

The present study addresses this issue and has implications for the plausibility of classical conditioning versus cognitive-affective processing explanations of the phenomenon. The research question is

whether or not an individual's affective state determines product preferences. The subject's affective state is manipulated by the context of a commercial. The hypothesis is that the subjects will prefer a product presented in the context of a positive stimulus more than the one presented in the context of a negative stimulus.

Overview

The present study attempted to eliminate the methodological artifacts associated with the previous investigations by taking the following steps: 1) Affect was induced by music in a between subjects design to rule out the previously discussed threats associated with repeated designs; 2) Random assignment was employed to eliminate a selection problem; 3) The study ostensibly dealt with a market research involving copy test and taste test for several beverages: wine, beer, coffee, soda, orange juice, and grapefruit juice. Copy and taste tests served as a disguise, provided closure after the stimulus presentation (commercial with background music), and separated the dependent measures from the treatment; 4) The beverage product category was chosen to reduce demand characteristics by allowing for an unobstrusive behavioral drinking measure, and providing a taste test; 5) White wine was selected to be the focal beverage (with which the treatment music is paired) because it was a product of interest to the subjects but not one about which they have extreme opinions.* These

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*Based on evaluative ratings of different beverages obtained in a pilot study with twelve subjects.

criteria were invoked to minimize Type II error; 6) Multiple beverages were used to improve the disguise by embedding the focal beverage among the others thus to reduce awareness of the focal commercial-music pairing; 7) Subjects were told that these products would be promoted as dinner drinks. This dinner prime was constructed to invite demand: if the subject is influenced by the demands of the situation, this bias should be reflected in all his responses, towards all of the beverages; 8) Two dependent variables were measured: milliliters (ML) consumed and taste evaluation. ML consumed was unobtrusive because the subjects did not realize that the amount they drank would be measured. Hence, this variable served to rule out a demand explanation and to increase the possibility for conditioning-a direct transfer to drinking behavior is more likely than to a more conspicuous behavior or a verbal response. The second dependent variable was a paper and pencil measure of preferences: taste evaluations. This is a more dissociated response to the commercial stimuli than, for example, brand attitudes or choice behavior, both conceptually and procedurally. Thus, it served to reduce demand characteristics and the possibility for automatic affect transfer.

Stimuli

The initial step in designing the experimental manipulation involved selecting an operationalization of the conceptual independent variable-"immediate affective state." Affect is used as a generic term here. The literature abounds with different definitions of mood,

emotion, feeling, and affect (Kleinginna and Kleinginna, 1981; Mandler, 1975, 1982; Pribram, 1980; Simon, 1979, 1982); Young, 1961. According to Simon (1982) affect designates a state and process in the cognitive, autonomic nervous, and endocrine systems; and mood is affect that provides context for ongoing thought processes without noticeably interrupting them. The construct of interest in the present study is this subtle and immediate contextual affect or mood.

Some of the inductions used in the previous research are: reading self-referent mood statements (Velten, 1968), hypnosis (Bower, 1981), gifts and cookies (Clark and Isen, 1982), music (Gorn, 1982), and recollection of personal experiences (Srull, 1983). Music is chosen to manipulate affect because of the following properties: 1) It excites feelings in the listener (Meyer, 1956; and Young, 1961). Music experience evokes moods, and the response it induces has arousal and hedonic aspects (Cantor and Zillmann, 1973). It was found to be emotionally arousing in terms of verbal mood ratings (Galizio and Hendrick, 1972) and physiological indicators such as changes in GSR and heart rate (Zimny and Weidenfeller, 1963), depth of breathing (Ries, 1969), and brainwave rhythms (Walker, 1977); 2) Music is nonverbal. Verbal means of mood induction necessarily activate a variety of cognitive processes (Zajonc, Pietromonaco, and Bargh, 1982). Hence, music induces affect unconfounded with other constructs such as cognitive evaluations or persuasive information; 3) Previous experiments have used music to manipulate affect (Gorn, 1982; Park and Young, 1983); and 4) Affect manipulation via music has potential for

marketing applications, for example in advertising contexts.

The next step involved selecting 60-second segments of background music.* To induce a positive state a popular cheerful song-"Girls Just Wanna have Fun" by Cyndi Lauper was selected. An irritating piece-"Fontana Mix: Feed" (described to be reminiscent of a fire drill by some pretest subjects) by John Cage was used to create a negative mood.** Six "elevator music" pieces by Mantovani, Mancini, and Conniff served as neutral music.

The final step in stimuli construction involved preparing the visuals. Each commercial consisted of four videotaped pictures, with one or two line captions, each of which appeared on the screen for 15 seconds. All subjects saw the same visuals for all the beverages. Several criteria guided the composition of the storyboards. They all had to be somewhat interesting without any of them being particularly informative, distinctive or persuasive.*** These criteria were invoked to eliminate any systematic variance among the stimuli due to

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*Based on a sequence of pilot tests in which subjects indicated how each song made them feel, what thoughts it brought to mind, and how they rated the pieces on evaluative semantic differential scales.

**The irritating piece, atypical for background music, necessitated use of another disguise to prevent demand. If the negative treatment was being administered, before starting the VCR the experimenter said: "One of the commercials has a problem with the audio. This bug with the equipment developed today. We apologize for that but we cannot skip any commercials."

***Storyboards were prepared by an art student (who was given these intructions) and then were pretested on eleven subjects for colors, wording, and features of the animated figure.

nontreatment factors, and to minimize Type II error. The pictures depicted the beverages in color and an animated male character in black and white. Captions consisted of generic attributes.* (See Figure 5 for an example.)

Procedure

One hundred and four students at Northwestern's Graduate School of Management were recruited. Their participation was motivated by a chance to win one of three $50.00 lottery prizes. Approximately half of the subjects were males and half were females.

When subjects arrived at the laboratory, either individually or in groups of two or three, each was given the questionnaire entitled "Marketing Study for Dinner Beverages." The introductory page described the study as an investigation of opinions about beverages. The experimental task was described to involve viewing unfinished advertising for, tasting, and appraising each of the beverages. Subjects were instructed to pay attention to and evaluate different aspects of these commercials-visual, verbal, and background music. It was pointed out that all brands would be referred to as "Brand X" to prevent biasing towards a company name.

The subject answered some initial questions about gender, likelihood of drinking each of the beverages in terms of current consumption habits (0: not likely at all/10: very likely), and

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*Based on answers given by twelve pretest subjects to open ended questions about attributes of the beverages.

likelihood of being served each of the beverages for dinner. The first two questions measured individual difference factors that could be potential covariates of the dependent variables. The purpose of the third question was to strengthen the dinner prime.

Then the subject viewed a 60-second videotaped commercial for each beverage and evaluated each before the next one was presented. Five commercials were presented in a randomized order, and the wine commercial was presented last. The independent variable was introduced to vary the affective state conveyed by the music of the wine commercial. The focal commercial was presented last so that the feeling state as conveyed would be in effect when the response measures were taken. Individuals were randomly assigned to listen to irritating, cheerful or neutral music. Positive and negative treatments were constructed to investigate the effects of different kinds of affect rather than merely the presence or absence of one; and a control group was employed to determine baseline product preferences. Subjects evaluated each commercial on a series of seven-point semantic differential items before the next ad was presented. The questions consisted of ratings of the ad, pictures, animated character, message, and music (see Table 12).

The next section of the questionnaire, entitled "Taste Test," followed wine commercial evaluation. Six cups of 100 MLs of each beverage and crackers (to cleanse the palate) were placed in front of the subjects. Wine was offered first, followed by the other beverages in reverse order of the initial presentation. The subject drank and

evaluated each beverage on four semantic differential items (tastes very good/bad, very satisfying/unsatisfying, extremely likely/unlikely to buy, extremely likely/unlikely to be preferred by other people) before the next beverage was offered. Each item was presented vertically and on a separate page to encourage thoughtful answering. Upon completion of the questionnaire the subject was debriefed to check for hypothesis guessing. The subjects were asked to comment on what they thought the purpose of the study was, and whether there was anything unusual that puzzled them. Then they were sworn to silence (to prevent diffusion of treatments), thanked, and left the laboratory.

Thus, the experiment involved three different types of affective state, induced by music, in a between subjects design. Subjects were assigned randomly to each condition. Taste evaluation and ML consumed served as dependent variables.

Results

Manipulation Check

A principal component factor analysis with varimax rotation was performed on all of the ratings for the wine commercial. This analysis indicated that the items loaded on three factors (see Table 12). Labels were given to the factors on the basis of content of the items loading on a factor. The mood scale (Cronbach's α=.96), visual appeal scale (α=.94), and ad evaluation scale (α=.94) were reliable.

Each subject's responses on the respective items of each of these scales were summed to compose response scores for the three different

aspects of the commercial. Means and standard deviations categorized by treatments are shown in Table 13. Music ratings, reflecting mood, serve as the manipulation check. Ratings of the visuals and ad effectiveness do not yield manipulation checks but may serve as additional dependent variables. Music ratings are examined first followed by the other two.

Eight subjects were removed from analysis because of various difficulties in affect induction. Thus the total sample size was reduced to 96. A priori contrasts of affect scores indicated that the cheerful audio was judged to be more positive than both the neutral and the irritating music. ($F(1,93)=75.26$, $p<.001$, and $F(1,93)=395.87$, $p<.001$, respectively.) The comparison of neutral versus negative pieces was also significant: $F(1,93)=125.92$, $p<.001$. Hence, the music manipulation effectively induced the intended feeling states.*

Analysis of ratings for the visuals by a priori contrasts indicated no differences across treatment conditions. However, the ad was rated less favorably by the negative treatment group than both the positive ($F(1,93)=19.69$, $p<.001$) and the neutral ($F(1,93)=19.89$, $p<.001$) groups. Hence, feeling state influenced perceived persuasiveness of the messages and liking for the ad, but not the visual appeal of the wine commercial.

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*An analysis with 104 subjects, without eliminating any, yielded very similar findings for the manipulation check (as well as for the analyses on commercial evaluations and the main dependent variables).

Ratings of Taste and Amount Consumed

Separate analyses of variance of the two main dependent variables for each beverage indicated that affective state had an impact on the responses to wine, the product paired with the feeling induction, but not to other beverages. There were no statistically significant differences among treatment conditions in the response measures for the five beverages.* Hence, only the results with respect to responses to wine are discussed below. Means, standard deviations, and variances of the dependent measures, categorized by treatments, are shown in Table 14.

Subject's evaluations of the taste of wine were examined first. A principal component factor analysis with varimax rotation was performed on the four evaluative items. This analysis indicated that the items loaded on a single factor, which we shall refer to as evaluation. Each subject's response on the four items was summed to compose an evaluation score. This scale was reliable (Cronbach's α=.91).

A test of simple effects, via a priori ANOVA comparisons, revealed that subject's evaluations were less favorable if they were in the negative affective state than if they were in the positive state ($F(1,93)=8.64$, $p=.004$) or in the neutral state ($F(1,93)=7.27$, $p=.008$). The comparison of positive versus neutral groups did not indicate any

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*The only exception was obtained for the comparison of positive ($\bar{X}=42.38$) versus neutral ($\bar{X}=31.81$) groups' ML consumption of soda ($F(1,93)=3.95$, $p=.05$). There is no meaningful interpretation for this finding besides random error variance.

significant differences.*

ML of wine consumed was examined next. A priori contrasts revealed that subjects in the positive feeling state drank significantly less than the subjects in the negative mood ($F(1,93)=3.93$, $p=.05$). Other pairwise comparisons were not statistically significant even though subjects in the neutral state drank considerably less than those in the negative, and slightly more than those in the positive state.

To check further whether group differences were due to the affect manipulation, music rating score was used as a covariate. The covariance analysis indicated that, as expected, when the effect of the music manipulation was statistically removed, the group differences disappeared. Hence, the affective state created by the music manipulation appears to have mediated the treatment effects on subjects' responses.

To determine whether individual difference factors mediated the effects of the independent variable on subject's responses frequency of usage was considered as a covariate and gender was treated as a blocking variable in separate analyses. These analyses are not presented because the individual difference factors did not

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*This (lack of statistically significant difference) may be due to the possibility that positive induction was not as strong as the negative one. This possibility was revealed during the debrief and also by a comparison of the difference in music ratings revealed during the debrief and also by a comparison of the difference in music ratings (especially on the last four items) of positive versus neutral groups ($d=3.28-1.98=1.3$) with the difference of negative versus neutral groups ($d=6.84-3.28=3.56$). The former difference is much less than the latter ($T=36.48$, $p<.001$).

significantly alter the impact of the independent variable.*

Discussion

The findings are consistent with the hypothesis and Gorn's (1982) results for one dependent variable, but in the opposite of the expected direction for the other dependent variable: a subject in a negative affective state consumed more of the beverage and evaluated the taste less favorably than a subject in a positive affective state. Before exploring this unexpected attitude-behavior inconsistency and discussing the interpretation of the intriguing reversal for the behavioral response, two issues delineated earlier are addressed: demand characteristics and classical conditioning as explanations for the observed effects.

A demand characteristics explanation is ruled out because treatment effects were obtained on some but not all of the responses, and not always in the same direction: 1) responses to only one of the six beverages were influenced by affective state in spite of the attempt to create a tendency of behaving similarly towards a set of products associated by a "dinner" prime; 2) feeling state influenced evaluations of ad effectiveness but not the visual appeal of the wine

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*Except, when the covariance analysis was conducted on ML consumed, there was a slight increase in the α value ($p=.066$ with the covariate as opposed to $p=.05$ without the covariate) for the positive versus negative treatment comparison. However, when this analysis was performed on all subjects ($n=104$) then $p=.05$ with the covariate.

commercial; 3) reversal in the direction of treatment effect on the amount of wine consumed is problematic for a demand account: a subject who attempted to conform with the perceived purpose of the experiment, would not have drunk more when the beverage was paired with a negative stimulus than with a positive one; and 4) during debriefing almost all subjects indicated their belief in the experimental disguise. Only very few subjects suspected some kind of relationship between music and product evaluations. These results indicate that the experimental procedures and disguises successfully eliminated biased responding due to demands of the situation.

Having shown that affective context does influence product preferences the issue becomes what is the mechanism that explains this phenomenon. The plausibility of a classical conditioning explanation is examined next. Discussion of the implications of the results will follow an examination of the classical conditioning literature.

The domain of conditioning model involves a transfer of responses between stimuli. "The traditional hypothesis for classical conditioning is that the repeated pairing of a conditioned stimulus (CS) with unconditioned stimulus (UCS) will cause the CS to elicit a conditioned response in an unconscious, automatic fashion" (Brewer, 1974, p. 1).

Attitudes and emotional responses such as GSR have been conditioned to numerous objects including nonsense syllables, names, photographs of persons, and geometric nonsense figures, by pairing these CS with a variety of UCS such as words of common affective values

or electric shock (Byrne and Clore, 1970; Sachs and Byrne, 1970; Staats, 1983; Staats and Staats, 1957 and 1958; Staats, Staats, and Crawford, 1962; Zanna, Kiesler, and Pilkonis, 1970). Classical conditioning has generally been accepted in consumer behavior literature (Kroeber-Riel, 1979; Schiffman and Kanuk, 1983) and in the ad affect literature as a mechanism relevant to understanding advertising effects. So strong is the sentiment that one author, arguing that the affective state at the time of exposure to the commercial message transfers to attitude towards the ad, states that "there is virtually no likelihood that this effect would be cognitively mediated" (Lutz, 1983, p. 14).

Although there is little doubt that attitude towards an object can be influenced by pairing that object with other stimuli of known positive or negative evaluation, the assumption of an automatic conditioning process is open to question (Brewer, 1974; Fishbein and Ajzen, 1975). The viability of automatic conditioning rests on the "question of awareness"-whether the subject had knowledge of systematic pairings between the stimulus object and new stimulus. This issue was mentioned earlier.

Proponents of classical conditioning, such as Staats, contend that conditioning takes place even in the absence of awareness. Others argue that awareness is imperative to obtaining the so-called conditioning effects. Brewer (1974) reviewed experiments designed to dissociate "higher mental processes" from the unconscious and automatic effects of CS and UCS pairings. Replications with a more sophisticated

assessment of awareness than the one employed by the Staatses found the conditioning effect only in aware subjects. Furthermore, studies which disguised the CS-UCS association indicated reduced or no conditioning. Brewer (1974, p. 27) concludes that "there is not and never has been any convincing evidence for unconscious automatic mechanisms in the conditioning of adult human beings." Dulany (1974), on the other hand, suggests that behavioral theory can reconcile the assessment and manipulations. However, he acknowledges that the cognitive account is equally plausible as classical conditioning.

Thus, there is no consensus on whether or not the pairing effect is due to automatic conditioning. Furthermore, marketing studies do not necessarily employ research paradigms typical of classical conditioning studies: for example, procedures such as repetitions and critical temporal associations between stimuli are usually not employed. The implication is that we cannot rely on classical conditioning as an explanation of empirical findings. The pattern of the present results, which are discussed below, add to the evidence in the literature that the pairing effect is not due to automatic conditioning.

In classical conditioning terminology, the present study paired a CS (product in the commercial) with an UCS (an affective background feature) in one trial. The main dependent variables were responses to taste-a separate and somewhat dissociated stimulus and not to the actual (conditioned) stimulus paired with the affective stimulus. Hence, treatment effect, obtained in a single trial, was unlikely to involve a direct, automatic affect transfer even if the principle of

generalization of learning is invoked. Furthermore, if generalization did take place, one would expect especially the behavioral responses to indicate affect transfer. However, the observed treatment effect on ML consumed was in the opposite direction. Besides, if the treatment effect involved a classical conditioning mechanism, responses to all stimuli (all elements of the commercial) paired with music (UCS) should have been influenced. However, ratings of the visuals did not indicate a treatment effect. Hence, it appears that a direct affect transfer explanation cannot account for the observed effects on either the commercial evaluations or the main dependent variables.

Having ruled out demand characteristics and classical conditioning interpretations, the question becomes what explanation accounts for the findings. A cognitive-affective processing explanation, which provides useful ideas for future research, is proposed.

Using the availability construct (Tversky and Kahneman, 1973), we suggest that, at the time of evaluation, a subject's response to the product is determined by the thoughts available in the memory about that product. These thoughts are retrieved by the stimuli (commercial, music, taste), situational cues (perceived norms about taste tests), and other thoughts being rehearsed at the time. Affective context makes mood congruent thoughts available. Affect biases availability because it functions as a search cue to be used in the absence of other strong cues (Bower, 1981; Clark and Isan, 1982). This notion relies on inclusion of emotion nodes, as organizing units, in an associative network model of representation and processing, with activation

spreading, via associative pathways, from feeling nodes to other concept/ object nodes or vice versa. Research evidence that feeling states can cue retrieval of material in memory linked to that state is provided by a number of studies: Bower, et al., 1978; Isen, et al., 1982; Laird, et al., 1982; Teasdale and Fogarty, 1979; Weingartner, et al., 1977. Bower (1981) argues that thoughts retrieved by mood are used in expectation-driven processing to classify and assimilate ambiguous material. Thus, mood congruent thoughts are used in elaboration, interpretation, and evaluation, biasing these processes by the availability of positive versus negative features that are brought to mind.

In the current experimental situation, the audiovisual stimulus evokes mood congruent wine thoughts. For example, in the positive affect condition pleasant experiences with wine or a lively party may be remembered. The neutral (and therefore somewhat ambiguous) product information is encoded and elaborated within the context of mood congruent thoughts. Thus, interpretation of product information, and impressions about Brand X wine are biased by the availability of positive versus negative thoughts. The subject, tasting the beverage, attempts to reach a decision as to how much s/he likes it. The amount consumed is suggested to indicate the effort put into decision making (during debriefing subjects indicated that they drank as much as necessary to make a judgment, which involved comparison with previous consumption experience). Evaluation reflects the end result of this judgment process.

There is some supporting data for this post hoc explanation. Responses to nonfocal beverages are examined first. Lack of treatment effects might have been a joint function of the following: 1) initial encoding and hence expectations were neutral because the affective contexts of these commercials were neutral, and 2) affect congruent wine thoughts could not spread to other beverage nodes because activation was weakened and interfered with by the time the subject evaluated the nonfocal products.

Responses to the focal beverage are examined next. Evaluations were affect congruent and thus consistent with the above theoretical approach. Interpretation of findings on ML consumed involve viewing this measure as a different construct-amount of effort spent on the task, and referring to characteristics of the negative treatment condition.*

Investigations of influence of different types of negative states on performance on a variety of tasks indicate a similar trend: inefficiency. Depression was associated with poor learning. Miller

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*An alternative explanation that the subjects simply did not like the taste of the beverage is ruled out by the correlation between the dependent variables. If this view were correct, the more a subject drank (for some noncontrolled factor such as an individual difference variable) the less favorably the beverage should be evaluated. However, the small but statistically significant correlation between the dependent variables ($r=-.17$, $p=.05$) indicated just the opposite. Conceptually, the correlation is positive, because smaller evaluation scores represent more favorable responses. Hence, despite the tendency that the more ML consumed the more positively the taste is evaluated (slope of the relationship between the dependent variables) affective state determines responses such that treatment groups behave differently as indicated by their means.

and Seligman (1975) indicated that depressed subjects required more trials and longer latencies in solving anagrams than nondepressed subjects. Fisher and Marrow (1934) found that average reaction time, in a word association task of a subject in a sad mood was greater than those in a happy or neutral mood. Shaw (1979) suggests that decision making skills are decreased in depression. Easterbrook (1959) found worse performance on tasks that require integration in anxious versus non-anxious subjects. Eysenck (1979) argues that anxiety is associated with task-irrelevant cognitive activities. Such activity, preempting some of the limited capacity of working memory, produces decrements in the quality of performance. To compensate for such inefficiency in performance individuals increase effort expenditure.

If the amount of beverage consumption indicates effort put in the decision process, then the finding that subjects in a negative state consumed more ML than other subjects is consistent with the notion that, in the negative state, judgment process is more difficult, and involves more uncertainty and effort before a decision is reached.*

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*An alternative interpretation relies on the inconsistency of the taste stimulus with expectations and has compatible implications for effort expenditure. It is plausible that the knowledge of upcoming taste test leads to expectations about taste. Then expectations as well as other thoughts will be biased by the availability of positive versus negative thoughts. A pretest where expectancies were measured revealed mood compatible preconceptions. During the taste test perception of taste may be colored by expectations. While consuming the beverage, the subject attempts to verify his expectations. In the positive condition taste sensation is somewhat congruent (mean evaluation in neutral group=2.97) with expectations; thus, a few sips confirm preconceptions. However, in negative condition taste sensation is incongruent with expectations; hence more effort spent, more ML consumed to verify preconceptions.

Further support for this suggestion is provided by the analysis of variability in the responses. Variability of subjects within conditions as well as the average response might reflect systematic differences among the treatment conditions (see Table 12). Differences in variances across experimental groups can be viewed to denote differential extents of attentional resources being taken up by thoughts peculiar to the individual versus thoughts common across subjects.* Under uncertainty there may be no consensus in the cues subjects use to reach a judgment. Then subjects will gravitate to their own thoughts. Unequal variances imply that rehearsal of own thoughts and idiosyncratic experiences, given that each individual has a different set, take up more memorial resources in one group (negative) than the other (positive or neutral). This notion is consistent with the view developed above that subjects in the negative treatment condition are more preoccupied with affective thought-because of the difficulty of reaching a decision, subject rehearses more wine associations and makes more comparisons with past experiences than subjects in the other groups. The prediction which would be in accordance with this view was confirmed: responses in a negative affective state involved more variability than in either positive or

*Personal communication with B. Sternthal.

neutral states.*, **

Conclusion

Contextual affect paired with product presentation influenced responses to that product: a negative feeling state led to more consumption and less favorable evaluations of the beverage. The results of the study indicate that the pairing effect exists beyond

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*ANOVA performed separately on the variances of the dependent variables revealed that there was an impact of affect on the variability of both evaluation ($F(2,93)=3.48$, $p=.035$) and ML consumed ($F(2,93)=3.18$, $p=.046$). The variance in evaluation was significantly greater in the negative condition than in the positive condition ($T(93)=2.59$, $p=.011$), and slightly larger than that in the control group ($T(93)=1.73$, $p=.088$). Similarly, the variance in the ML measure of the negative group was significantly greater than both the positive group ($T(93)=2.22$, $p=.029$) and the neutral condition ($T(93)=2.15$, $p=.034$).

In order to suggest that the affect treatment causes variability differences, we have to rule out other plausible reasons. Individual difference variables, such as consumption habits and gender, may interact with the independent variable and lead to larger variances in one treatment group versus the other. An ANOVA of the variances of usage likelihood indicated that treatment groups had equal variability with respect to consumption habits. Separate ANOVAs were performed on the variances of the dependent measures using frequency of usage or gender as a blocking variable. Consumption habits factor was converted into a two-level variable: below the mean (infrequent users) and above the mean (frequent users). Variability in each of the response measures were the same for frequent versus infrequent users (or males versus females) within each treatment condition. Hence, interaction of individual difference factors with the independent variable is ruled out as an explanation of the observed differences in response variability across treatment groups.

**The differences in the variances imply that the homogeneity of variance assumption of the ANOVA model was violated. The model is robust to such violations, especially if the assumption of independence of scores and normality are met, and cell sizes are equal (Myers, 1979). These conditions were met in the present experiment. Also, a reanalysis of the data using a less powerful significance test with separate variance estimates did not yield any considerable changes in the results and conclusions.

methodological artifacts and suggest that it is not due to classical conditioning. A cognitive-affective processing explanation is proposed. Observed treatment effects on both average responses and variability in responses are consistent with this explanation. The hypotheses driven by the current view should be tested in future research. Mediating constructs such as potency of expectations and elaborateness of knowledge structure should be experimentally manipulated, and uncertainty and reaction time measures should be taken.

One line of research to test the active processing view is suggested by Johnson and Tversky (1983). They reported that the influence of affect is global, such that a variety of responses-risk perceptions about a set of negative events, not necessarily related to the mood inducing experience-a story about a fatal incidence, were mood congruent. Johnson and Tversky (1983) argue that the presence of a pervasive global effect in the absence of any effect of similarity is consistent with the view that the influence of affect is at least partially independent of semantic associations. They suggest that for the mood effect to be dependent on memorial associations a local (only the risk that matches the story topic being influenced) or a gradient effect (risks closely linked to the story being affected more than unrelated risks) should have been obtained.

The present findings, however, reveal a local effect-responses only to wine, which was the product directly associated with affective experience were influenced. This result is consistent with a

memory-based processing approach. In pursuit of testing the affective-cognitive processing explanation of affect, future research should attempt to specify the conditions under which mood effects are local, gradient or global.

CHAPTER IV

CONCLUSION

We often hear statements such as "the discussion fell to the emotional level, but I raised it back up to the rational plane" or "we put our feelings aside and had a high-level intellectual discussion of the matter" (from Lakoff and Johnson, 1980). These statements imply that emotional and cognitive planes are different and separable. However, historically psychologists and philosophers have been aware of the role of "affective" factors in thought processes. For example, Hume (in Rapaport, 1942) argued that "passions are the driving forces of our associations, even the basis of our rational causes. Conversely, cognitions influence how feeling states are experienced by labeling and interpreting the situation and the stimuli. This dissertation has considered how the emotional plane interacts with the "rational" or cognitive plane. Each of the chapters attempts to examine the nature of this interaction in some way, the final objective being to improve the understanding of the judgment process.

The purpose is not to engage in a debate over whether affect or cognition has primacy-whether affective excitation reflected in autonomic arousal or motor patterns occurs prior to or after recognition (see, Lazarus, 1984; and Zajonc, 1984 for that debate). It is believed that what is more interesting is to investigate the processes that produce judgment; and that during the course of the study of how

affect impacts judgment the interaction between affect and cognition is better specified.

The process by which affect influences judgment can be examined in different levels of reduction: psychological and physiological (see Izard, 1984 for a reductionist view). A physiological view of investigation is beyond the scope of the present study. A reductionist approach is not necessarily more fruitful. Research on neurophysiological bases of emotion is not without confusion. Besides, "however the connections between psychological and physiological levels of analyses are conceived, explanations at each level must be both viable and independent even before any attempt at reduction is made in an effort to achieve the dream of a unified science" (Lazarus, 1984, p. 128).

The general conceptual background of the present framework involves the following assumptions:

1) Judgments reflect what is available in mind as a person is thinking about the object to be assessed.
2) At any point in time, total contents of long-term memory cannot be available. Given the extensive nature of long-term memory, people will try to make the judgment task as easy as possible on themselves. All cues will be used to aid the efforts in making a judgment. Such cues are provided by the context. Simon (1982, p. 341) argues that "the idea of spreading activation is that the course of cognitive processes must be responsive to context-they cannot respond indifferently to the

total contents of the long-term memory. The activated portion of LTM defines the momentary context." The context enhances efficiency of thought processes by directing attention, helping retrieval and simplifying the cognitive processes.

3) Evolutionary adaptation suggests that our behavior must be appropriate to context for us to behave effectively. For examle, if I am angry or frustrated because the copier broke down, I may bang on the copier and also think that all office equipments break down frequently, but I will not necessarily yell at the first person who walks in my office. Contextual cues are used to help discriminate and select an appropriate response.

Affect is viewed to be a contextual element, and to function like any other contextual element to improve effectiveness and efficiency of thought processes. Mood can originate in internal stimulation and arousal, but also in evocations of long-term memories that cause autonomic and endocrine arousal (Simon, 1982). Affect acts as a source of activation. Thus, effects of moods are to establish contexts that influence and direct cognitive activities, for example, bias memory retrieval processes toward certain LTM contents and away from others, or focus attention on those aspects of stimulus that are congruent with the mood.

The conceptual rationale and viewing affect as a source of activation in the associative network lead to the present suggestion that mood cannot always have a global effect. Chapter II attempts to

specify the conditions under which affect will have global versus specific effects. The studies produced uninterpretable results with respect to the specific spreading activation predictions tested. However, the pattern of the findings suggest that mood effects are not always global and that contextual cues have some kind of an impact. The process seems to be more complicated than initially thought.

Chapter III reports a study which attempted to rule out a major alternative explanation that is plausible for many affect studies: demand characteristics. With affective context induced by nonverbal means and under a disguise, the pattern of results on a number of measures rule out a demand explanation and indicate a local mood effect. The findings imply that this local effect is unlikely to be due to a direct affect transfer. Rather active cognitive processes-availability biased by affective context and other contextual cues seem to underlie the local mood effect in this study and the mood effects in the previous studies which used different mood inductions and paradigms. Therefore, the nature of the interaction or interdependence between the emotional and cognitive planes seems to be as follows: affect impacts judgment by biasing availability of thoughts; on the other hand, the specificity of this impact is influenced by other contextual cues; and this process appears to be consistent with the spreading activation notion.

The studies suffered from a number of difficulties and limitations. First, calibration of affect induction proved to be very problematic. For example, the product scare story could have been too

scary to be effective. Literature on fear appeals have suggested that intensity of fear may influence the effectiveness of a message (Sternthal and Craig, 1982). Furthermore, experimental mood effects are usually small. Although experimental settings offer the potential to test theoretical predictions, size of mood effects becomes a problem in such settings, requiring strong inductions and leading to calibration problems. Note, however, the small mood effects in the lab does not mean that affect does not have an important impact on judgment. First, in natural settings mood is aroused by salient personal events and may have even a larger influence on judgment. Second, from an application perspective, a small difference may make the difference in a competitive world. Thus, calibration of affect induction and elimination of demand are critical to any future study of moods.

The next difficulty involved assessment of proximity in an associative network. "Like other judgments, similarity depends on context and frame of reference" (Tversky, 1977, p. 340). Just as context influences the particular aspects of word meanings that are salient on any particular occasion (Ortony, 1979) and changes the connotative meaning or interpretation of a attribute (Hamilton and Zanna, 1974) so can it change the interpretation of similarity or relatedness among a number of objects. Similarity is not unidimensional. Depending on the dimension highlighted by context different objects may be similar or related to the focal object. Making a particular dimension salient will focus activation on a set of

sociations different than those activated by another dimension. ternatively two objects may be perceived to be closely associated on e dimension, but not at all on another dimension. For example, beer y be perceived to be very similar to wine if attention is drawn to he attribute of wine-low alcohol content but not if focus is on anoth- attribute of wine-elegant dining. In the latter case, nonbeverages uch as candles, crystal wine glasses, or silverware may be perceived o be related to wine. This problem of varying degrees of proximity etween two objects in an associative network) depending on which ttribute is focused on, is amplified by the reliance on natural ssociations. Idiosyncratic differences in associations may have verwhelmed the mood effects.

Future research will pursue testing specific predictions of preading activation hypothesis to pin down how context influences udgments. Goals as sources of activation and refocusing on subnodes an be manipulated to create conditions under which global versus pecific mood effects will be obtained. A more powerful test of preading activation mechanism can be provided by imposing treatment ets of associations experimentally to eliminate the difficulties iscussed above. Subjects may be primed to make one versus another set f associations available before a particular affect is induced.

Once falsification attempts are undertaken, "application oriented" udies can be designed (Calder, Phillips, Tybout, 1981). More ractical research can be undertaken to directly address the marketing roblems that were mentioned in the introduction. These studies can

developed. The present approach emphasized investigation of the processes by which affect influences judgment because once the conditions which lead to global versus specific effects are understood, this understanding can be used to design effective marketing strategies.

TABLE 1-A
Johnson and Tversky's results:
reported analyses of variance findings
for four experiments

	ANOVA	
Experiment 1		
4 groups: Fire, Leukemia, Homicide, & Control Stories Risk: 17 causes of death	Experimental to Control Contrast: Story x Risk :	F(3, 69)=2.76, p<.05 F(48, 1078)=1.04, p>.40
Experiment 2		
4 groups: Fire, Leukemia, Homicide, & Control Stories Risks: 7 causes of death	Story : Experimental to Control Contrast: Story x Risk :	F(3, 182)=4.11, p<.01 F(1, 182)=5.86, p<.025 F(18, 1083)=.80, p>.65
Experiment 3		
3 groups: Homicide, Depressing, & Control Stories Risks: 7 causes of death, 7 nonfatal events, and 7 life problems	Story :	F(2, 183)=3.06, p<.05
Experiment 4		
2 groups: Positive & Control Stories Risks: 7 causes of death, 7 nonfatal events, and 7 life problems	Story : Story x Risk :	F(1, 106)=5.78, p<.01 F(20, 2120)=1.06, p>.06

TABLE 1-B

Johnson and Tverky's results:
ratios of experiment to control means
for matched and non-matched stories, experiments 1 and 2

		Experiment 1		Experiment 2	
Type of Risk	Risk	Matched Story	Non-Matched Story	Matched Story	Non-Matched Story
Target	Leukemia	3.52	3.65	2.70	2.49
Near-Target	Lung cancer Stomach cancer	3.45	5.02	2.29	1.95
Non-Target	All other Risks	1.37	1.55	1.45	1.49
Target	Fire	.94	1.50	1.62	3.02
Near-Target	Electrocution Lightning	1.34	1.75	1.13	1.66
Non-Target	All other Risks	1.52	1.97	1.17	1.34
Target	Homicide	1.22	1.16	2.38	1.31
Near-Target	War Terrorism	.75	1.91	1.16	.76
Non-Target	All other Risks	2.86	1.53	2.83	1.64

TABLE 2

Similarities and differences between Johnson and Tversky's first experiment and the present studies

Variables and Other Aspects of the Studies	Johnson and Tversky (Experiment 1)	Experiment 1	Experiment 2
Stimuli materials, procedures and instructions	Johnson and Tversky questionnaires	same	same
Instruction to be consistent	yes	no	no
Dependent variable	estimation of number of fatalities due to 17 causes	same	same
Independent variable 1: story topic	fire, homicide, leukemia, neutral	homicide, leukemia, neutral	homicide, leukemia, neutral
Independent variable 2: presence of mood rating	present	present/ absent	present/ absent
Independent variable 3: order of risks	target in the middle	target first/ middle	target first/ middle
Manipulation check	9-point mood item	two 7-point mood items	two 7-point mood items
Sample size	72	300 (276 after missing data)	141
Subject processing context	classroom setting	classroom setting	lab setting: individually or groups of 2-3
Subject population	undergraduate students	graduate students	graduate students
Questionnaire context	one of many questionnaires	the only questionnaire	the only questionnaire

TABLE 3-A

Experiment 1: Logarithmic means and standard deviations of target, near-target, and non-target risk estimates when "homicide" is the target, across story, feeling question and order of risk presentation conditions

Risk Estimates for Homicide

Type of Story	homicide estimate presented first (no-build-up cue)		leukemia estimate presented first (build-up cue)	
	No Feeling Question Asked	Feeling Question Asked	No Feeling Question Asked	Feeling Question Asked
Neutral (Control)	Target[1]: 9.81[4] (1.51)[5]	10.23 (1.19)	9.98 (1.37)	9.82 (1.30)
	Near-target[2]: 3.88 (3.04)	4.13 (3.21)	3.99 (2.87)	4.49 (3.39)
	Non-Target[3]: 7.11 (1.08)	7.57 (0.79)	7.33 (0.94)	7.43 (0.89)
Negative: homicide (matching)	10.26 (1.40)	9.67 (1.06)	10.24 (1.10)	9.70 (1.32)
	5.28 (3.15)	4.29 (2.51)	4.49 (2.76)	5.31 (2.95)
	7.16 (1.20)	6.89 (1.19)	7.37 (0.84)	7.36 (0.81)
Negative: leukemia (non-matching)	9.92 (0.84)	10.02 (1.01)	9.86 (1.15)	10.39 (0.95)
	4.50 (2.56)	4.52 (2.77)	5.33 (2.90)	4.33 (2.95)
	6.99 (1.19)	6.97 (1.28)	7.51 (1.10)	7.50 (1.01)

[1]Target: homicide.

[2]Near-target: (war + terrorism)/2.

[3]Non-target: remainder.

[4]Mean values are the means of logarithmic transformed estimates.

[5]Parenthesis enclose standard deviations.

TABLE 3-B

Experiment 1: Logarithmic means and standard deviations of target, near-target, and non-target risk estimates when "leukemia" is the target, across story, feeling question and order of risk presentation conditions

Risk Estimates for Homicide

Type of Story	homicide estimate presented first (no-build-up cue)		leukemia estimate presented first (build-up cue)	
	No Feeling Question Asked	Feeling Question Asked	No Feeling Question Asked	Feeling Question Asked
Neutral (Control)	Target[1]: 9.52[4] (1.45)[5]	9.24 (1.70)	9.52 (1.63)	9.28 (1.31)
	Near-target[2]: 9.84 (1.45)	9.41 (0.96)	9.49 (1.77)	9.56 (1.10)
	Non-Target[3]: 6.53 (1.08)	6.76 (1.18)	6.33 (1.11)	6.86 (1.13)
Negative: leukemia (matching)	9.09 (1.16)	9.08 (1.70)	8.57 (1.83)	9.28 (1.56)
	9.52 (1.19)	9.61 (1.45)	9.04 (1.82)	9.28 (1.71)
	6.97 (1.25)	6.84 (1.20)	6.43 (1.18)	6.34 (1.26)
Negative: homicide (non-matching)	9.64 (1.41)	9.32 (1.51)	8.83 (2.22)	8.55 (1.83)
	9.29 (1.31)	9.67 (1.03)	9.07 (1.76)	9.30 (1.72)
	6.73 (0.95)	6.76 (1.04)	6.72 (1.31)	6.56 (1.25)

[1]Target: leukemia.

[2]Near-target: (lung cancer + stomach cancer)/2.

[3]Non-target: remainder.

[4]Mean values are the means of logarithmic transformed estimates.

[5]Parenthesis enclose standard deviations.

TABLE 4-A

Experiment 1: Means and standard deviations of target risk estimates when "homicide" is the target, across story, feeling question and order of risk presentation conditions

Risk Estimates for Homicide

Type of Story	homicide estimate presented first (no-build-up cue)		leukemia estimate presented first (build-up cue)	
	No Feeling Question Asked	Feeling Question Asked	No Feeling Question Asked	Feeling Question Asked
Neutral (Control)	49000.0[1] (84598.2)[2]	45842.1 (44766.3)	43354.1 (47167.7)	42400.0 (68008.5)
Negative: homicide (matching)	59620.0 (77729.1)	30608.6 (52658.1)	48519.2 (62927.0)	32534.5 (41592.3)
Negative: leukemia (non-matching)	28809.5 (27187.5)	43250.0 (71603.3)	31880.0 (29127.6)	51545.4 (63319.8)

[1]Mean values.

[2]Parentheses enclose standard deviations.

TABLE 4-B

Experiment 1: Means and standard deviations of target risk estimates when "leukemia" is the target, across story, feeling question and order of risk presentation conditions

Risk Estimates for Leukemia

Type of Story	homicide estimate presented first (no-build-up cue)		leukemia estimate presented first (build-up cue)	
	No Feeling Question Asked	Feeling Question Asked	No Feeling Question Asked	Feeling Question Asked
Neutral (Control)	26870.8[1] (43290.6)[2]	40868.0 (109208.2)	35909.9 (50695.0)	37894.7 (112291.7)
Negative: Leukemia (matching)	17600.0 (29443.4)	28463.6 (54123.3)	21350.0 (43748.2)	26425.0 (31539.9)
Negative: Homicide (non-matching)	35961.5 (53945.5)	43898.5 (109319.5)	29394.0 (46372.6)	18469.5 (34198.5)

[1]Mean values.

[2]Parentheses enclose standard deviations.

TABLE 5

Means and standard deviations of target and near-target risk estimates across different story conditions, for specific contextual cue conditions, Experiment 1

Risk Estimates

Type of Story	Target: Leukemia		Target: Homicide	
	Leukemia	Near-Leukemia ((Stomach cancer + Lung cer)/2)	Homicide	Near-Homicide ((War + Terrorism)/2)
Leukemia Story	FQ, H First[1] 9.32[2] 1.49[3] $\vee$[4]	FQ, L First 9.59 (1.45) $\vee$	No FQ, L First 9.84 (1.13) $\wedge$	FQ, L First 4.19 (2.96) $\wedge$
Homicide Story	FQ, H First 8.65 (1.79)	No FQ, H First 9.14 (1.71)	No FQ, H First 10.22 (1.32)	FQ, L First 5.31 (2.95) $\vee$
Neutral Story	FQ, L First 9.24 (1.70)	FQ, L First 9.41 (0.95)	No FQ, H First 9.96 (1.62)	No FQ, H First 3.88 (3.04)

[1]Contextual cue conditions:
FQ: Feeling question asked
No FQ: Feeling question omitted
H First: The first risk to be estimated was homicide
L First: The first risk to be estimated was leukemia

[2]Mean values are the means of logarithmic transformed estimates.

[3]Parenthesis enclose standard deviations.

[4]$\vee$ and $\wedge$: Direction of differences of those comparisons that were significant at α=0.05 when a Scheffe procedure was employed using harmonic mean cell sizes.

Note: Some of the means reported in Table 5 are slightly different than the corresponding ones in Table 3 due to differences in missing data.

TABLE 6

Ratios of experiment to control means for matched and non-matched stories, Experiments 1 and 2

Type of Risk	Risk	Replication Cells[1]		All the Cells[2]	
		Matched Story	Nonmatched Story	Matched Story	Nonmatched Story
	Experiment 1:				
Target	Leukemia	1.00	.48	.68	.74
Near-Target	Lung/Stomach cancer	.76	.77	.81	.79
Non-Target	All other risk	.60	.55	1.03	1.00
Target	Homicide	.57	.81	1.01	1.09
Near-Target	War/Terrorism	1.17	1.48	2.05	1.73
Non-Target	All other risks	.51	.55	.85	.89
	Experiment 2:				
Target	Leukemia	2.25	1.94	.72	1.21
Near-Target	Lung/Stomach cancer	1.21	1.43	.82	.98
Non-Target	All other risks	.86	.88	.75	.58
Target	Homicide	1.67	1.36	.90	.61
Near-Target	War/Terrorism	1.07	.28	.34	.34
Non-Target	All other risks	.92	1.09	.69	.86

[1]Replication cells are the three story conditions where feeling question was asked and target risk was presented in the middle of the list of risks.

[2]Grand means of the story conditions were obtained collapsing over order and feeling treatments. According to Johnson and Tversky these contextual cue conditions should not impact the mood effect. If lack of power were an alternative explanation, results for all the cells (where power is greater) would look more like Johnson and Tversky's than those for the replication cells.

TABLE 7
Selected ANOVA and MANOVA findings for Experiments 1 and 2

Experiment to Control Contrast	Experiment 1	
All cells:		
ANOVA: averaged 17 risks	: F(1,264)=.08	, p=.77
MANOVA: 17 risks	: F(17,248)=.96	, p=.51
Replication cells:		
ANOVA: averaged 17 risks	: F(1,59)=2.79	, p=.10
MANOVA: 17 risks	: F(17,43)=1.63	, p=.10
Story Effect		
All cells: ANOVA: 17 risks	: F(2,264)=.05	, p=.95
Replication cells: ANOVA: 17 risks	: F(2,59)=1.47	, p=.24
Story by Risk Interaction[1]		
All cells:		
ANOVA (mixed-model)	: F(32,4224)=1.64	, p=.01
ANOVA: Huynh-Feldt correction:	F(12.5, 4224)=1.64,	p=.07
MANOVA: ungrouped risks[2]	: F(32,500)=.83	, p=.73
Replication cells:		
ANOVA (mixed-model)	: F(32,944)=1.29	, p=.13
ANOVA: Huynh-Feldt correction:	F(13.6,944)=1.29	, p=.21
MANOVA: ungrouped risks	: F(32,90)=1.19	, p=.26

Experiment to Control Contrast	Experiment 2	
All cells:		
ANOVA: averaged 17 risks	: F(1,129)=3.33,	p=.07
MANOVA: 17 risks	: F(17,113)=1.01,	p=.45
Replication cells:		
ANOVA: averaged 17 risks	: F(1,32)=.01,	p=.92
MANOVA: 17 risks	: F(17,16)=.69,	p=.77
Story Effect		
All cells: ANOVA: 17 risks	: F(2,129)=1.89	p=.16
Replication cells: ANOVA: 17 risks	: F(2,32)=.01,	p=.99
Story by Risk Interaction[1]		
All cells:		
ANOVA (mixed-model)	: F(32,2064)=1.94,	p=.001
ANOVA: Huynh-Feldt correction:	F(14.3,2064)=1.94,	p=.02
MANOVA: ungrouped risks[2]	: F(32,230)= 1.26,	p=.17
Replication cells:		
ANOVA (mixed-model)	: F(32,512)=.78,	p=.81
ANOVA: Huynh-Feldt correction:	F(13.4,512)=.78,	p=.69
MANOVA: ungrouped risks	: F(32,36)=.81,	p=.72

TABLE 7 (continued)

[1]Note 1: This interaction does not reach significance with MANOVA which is the preferred method here. MANOVA uses specific error terms linked with each contrast and thus avoids the problem with average error terms used by mixed-model ANOVA, namely the assumption of sphericity-equality of variances of repeated measures (17 risk estimates) and equality of correlations between pairs of repeated measures. Nonsphericity, which existed in the present studies, and probably also in Johnson and Tversky's data since they used the same measures, artificially inflates F values for tests of main effects and interactions involving the within subjects factor (risks). Huynh-Feldt modification systematically reduces degrees of freedom for sampling distribution of the F statistic (O'Brien and Kaiser, 1985).

Note 2: The story by risk interaction, if we pursue it in spite of the above discussion, is consistent with the present position that the effect of mood is not global and will depend on the type of risk to be estimated. In Experiment 1, lack of a story main effect on 15 risk estimates and presence of a story effect, in opposite directions, on two estimates may account for a story by risk interaction: a story effect on "war" estimates ($F(2,264)=3.43$, $p=.034$) such that experimental means (4.59) are larger than control means (3.25): $F(1,264)=6.84$, $p=.009$; and "heart disease" estimates ($F(2,264)=2.88$, $p=.058$) such that control means (11.11) are larger than experimental means (10.76): $F(1,264)=4.18$, $p=.042$. Similarly, in Experiment 2, story by risk interaction may be due to the fact that there was a story main effect on only several risks and such that control means were larger than either only homicide or both experimental means.

[2]The risks are not grouped here to simulate Johnson and Tversky whereas they were in the previously reported profile analyses.

TABLE 8-A

Experiment 2: Logarithmic means and standard deviations of target, near-target, and non-target risk estimates when "homicide" is the target, across story, feeling question and order of risk presentation conditions

Risk Estimates

Type of Story	homicide estimate presented first (no-build-up cue)		leukemia estimate presented first (build-up cue)	
	No Feeling Question Asked	Feeling Question Asked	No Feeling Question Asked	Feeling Question Asked
Neutral (Control)	Target[1]: 10.13[4] (1.62)[5]	9.71 (1.38)	9.82 (1.17)	10.45 (1.60)
	Near-target[2]: 7.15 (2.61)	5.04 (3.58)	5.50 (3.43)	5.31 (2.35)
	Non-Target[3]: 7.40 (1.52)	7.06 (1.17)	7.69 (0.95)	7.22 (1.11)
Negative: homicide (matching)	9.73 (1.06)	10.22 (0.63)	10.12 (1.34)	9.60 (1.35)
	3.97 (2.54)	5.11 (2.73)	4.76 (2.38)	4.81 (2.92)
	6.66 (0.94)	6.98 (0.95)	6.87 (1.32)	7.35 (0.99)
Negative: leukemia (non-matching)	9.42 (1.82)	10.02 (1.44)	8.97 (1.54)	9.70 (0.98)
	4.84 (3.02)	3.78 (2.82)	5.09 (3.05)	4.95 (1.83)
	7.17 (0.94)	7.15 (1.10)	7.31 (1.20)	7.12 (0.73)

[1]Target: homicide.

[2]Near-target: (war + terrorism)/2.

[3]Non-target: remainder.

[4]Mean values are the means of logarithmic transformed estimates.

[5]Parenthesis enclose standard deviations.

TABLE 8-B

Experiment 2: Logarithmic means and standard deviations of target, near-target, and non-target risk estimates when "leukemia" is the target, across story, feeling question and order of risk presentation conditions

Risk Estimates

Type of Story	leukemia estimate presented first (no-build-up cue)		homicide estimate presented first (build-up cue)	
	No Feeling Question Asked	Feeling Question Asked	No Feeling Question Asked	Feeling Question Asked
Neutral (Control)	Target[1]: 9.46[4] (1.80)[5]	9.66 (1.35)	9.20 (1.61)	8.18 (1.97)
	Near-target[2]: 9.67 (1.28)	9.00 (1.79)	9.56 (1.36)	9.04 (1.64)
	Non-Target[3]: 7.12 (1.22)	6.74 (1.24)	7.12 (1.62)	6.60 (1.17)
Negative: leukemia (matching)	8.76 (0.78)	8.72 (1.12)	8.71 (1.49)	8.99 (2.00)
	9.16 (0.56)	8.93 (1.27)	9.17 (1.77)	9.23 (1.81)
	6.74 (1.42)	6.62 (0.71)	6.60 (1.06)	6.45 (1.17)
Negative: homicide (non-matching)	9.67 (2.08)	10.16 (1.46)	8.58 (2.11)	8.84 (1.39)
	9.55 (1.77)	9.47 (1.20)	8.76 (1.49)	9.40 (1.68)
	6.21 (1.37)	6.65 (1.04)	6.06 (1.14)	6.47 (0.94)

[1]Target: leukemia.

[2]Near-target: (lung cancer + stomach cancer)/2.

[3]Non-target: remainder.

[4]Mean values are the means of logarithmic transformed estimates.

[5]Parenthesis enclose standard deviations.

TABLE 9-A

Experiment 2: Means and standard deviations of target risk estimates when "homicide" is the target, across story, feeling question and order of risk presentation conditions

Risk Estimates for Homicide

Type of Story	homicide estimate presented first (no-build-up cue)		leukemia estimate presented first (build-up cue)	
	No Feeling Question Asked	Feeling Question Asked	No Feeling Question Asked	Feeling Question Asked
Neutral (Control)	50272.7[1] (45913.7)[2]	30666.6 (30218.3)	29708.3 (27938.6)	74208.3 (106927.2)
Negative: homicide (matching)	27615.3 (29199.1)	32272.7 (19021.5)	41818.1 (35467.7)	27636.3 (29284.8)
Negative: leukemia (non-matching)	42972.7 (67788.0)	71041.6 (141523.6)	18875.0 (27367.1)	23615.3 (17993.2)

[1]Mean values.

[2]Parentheses enclose standard deviations.

TABLE 9-B

Experiment 2: Means and standard deviations of target risk estimates when "leukemia" is the target, across story, feeling question and order of risk presentation conditions

Risk Estimates for Leukemia

Type of Story	Leukemia estimate presented first (no-build-up cue)		homicide estimate presented first (build-up cue)	
	No Feeling Question Asked	Feeling Question Asked	No Feeling Question Asked	Feeling Question Asked
Neutral (Control)	40958.3[1] (61326.4)[2]	57916.6 (141186.1)	27727.2 (43765.4)	15895.8 (28998.5)
Negative: Leukemia (matching)	8041.6 (5127.7)	13384.6 (26329.7)	11681.8 (10852.2)	52983.3 (141445.3)
Negative: Homicide (non-matching)	58000.0 (74915.9)	76090.9 (145003.7)	26776.9 (54195.9)	14681.8 (17728.8)

[1]Mean values.

[2]Parentheses enclose standard deviations.

Table 10

Experiment 3: Means and standard deviations for beverage evaluations categorized by the type of story

	Story					
	Orange Juice Scare Story		Wine Scare Story		Neutral Story	
Evaluations	Mean*	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Bottled Orange Juice	2.11	0.63	2.11	0.97	2.45	0.96
Bottled Grapefruit Juice	2.63	0.90	2.96	1.27	3.85	1.34
Instant Coffee	4.45	1.79	3.29	1.45	4.95	1.36
Bottled Cola	3.37	1.07	2.77	0.95	3.13	1.29
Bottled Beer	3.27	1.45	3.87	1.78	3.44	1.95
Bottled Wine	2.31	0.75	3.01	1.47	2.32	1.24

*Smaller numbers indicate more favorable responses.

TABLE 11

Problems with ad affect literature

	Mitchell and Olson (1981): Posttest-only non-equivalent group design	Lutz, Mackenzie and Belch (1983): One-group posttest only design	Moore and Hutchinson (1983): One-group pretest posttest design	Kroeber-Riel (1984) One-group pretest posttest design
Threats to CONSTRUCT VALIDITY				
1. Confounded affect manipulation	X*	O.K.	O.K.	O.K.
2. Interaction of different treatments in a repeated treatments design	X	O.K.	X	X
3. Procedures that enhance demand characteristics:				
a-Subjects were told that they would be evaluating the ads	X	X	X	not reported
b-Order of questions	X	X	X	not reported
4. Interaction of testing and treatment	O.K.	O.K.	X	X
Threats to INTERNAL VALIDITY				
1. No experimental manipulation of affect	X	X	X	O.K.
2. Selection	X	not applicable	not applicable	not reported
3. Testing (test exposure may shift performance later)	O.K.	X	X	X

*X indicates the presence of the problem.

TABLE 12

Factor analysis results for stimulus (wine) commercial

Factor Label	Item Label	Semantic Differential Items	Loadings
Mood (62.8%)*	Music	exciting/dull	.77
		interesting/boring	.83
		cheerful/gloomy	.92
		uplifting/depressing	.92
		pleasant/unpleasant	.80
		likeable/dislikeable	.84
		enjoyable/annoying	.84
		pleasing/irritating	.81
Visual appeal (29.4%)*	Pictures	interesting/boring	.88
		exciting/dull	.85
	Animated character	interesting/boring	.90
		exciting/dull	.90
Ad effectiveness/Evaluation (7.9%)*	Ad	like/dislike	.72
		appealing/unappealing	.73
		persuasive/not at all	.74
	Message	convincing/not at all	.67

*Percent variance accounted for by each factor.

TABLE 13

Means and standard deviations for ratings of audio, visual, and effectiveness aspects of the wine commercial categorized by the type of affective state

Response Measure	Type of Affective State		
	Positive (n=32)	Negative (n=32)	Neutral (n=32)
Music/Mood Ratings (manipulation check)	1.86[a] (0.80)[b]	6.13 (0.76)	3.72 (1.00)
Visual Appeal	4.93 (1.40)	5.09 (1.23)	4.91 (1.34)
Ad Effectiveness	3.98 (1.41)	5.52 (1.26)	3.97 (1.51)

[a]Smaller numbers indicate more favorable ratings.

[b]Parentheses enclose standard deviations.

TABLE 14

Means, standard deviations, and variances for wine evaluation and milliliters (ML) of wine consumed categorized by the type of affective state

Dependent Measure	Type of Affective State		
	Positive (n=32)	Negative (n=32)	Neutral (n=32)
Wine taste evaluations	$\bar{X}$=2.89[a]	3.84	2.97
	σ=(1.03)[b]	(1.55)	(1.23)
	σ^2=[1.06][c]	[2.40]	[1.51]
ML of wine consumed	$\bar{X}$=22.28	32.25	25.50
	σ=(15.26)	(27.05)	(15.74)
	σ^2=[232.89]	[731.68]	[247.81]

[a]Smaller numbers indicate more favorable evaluations.

[b]Parentheses enclose standard deviations.

[c]Square parentheses enclose variances.

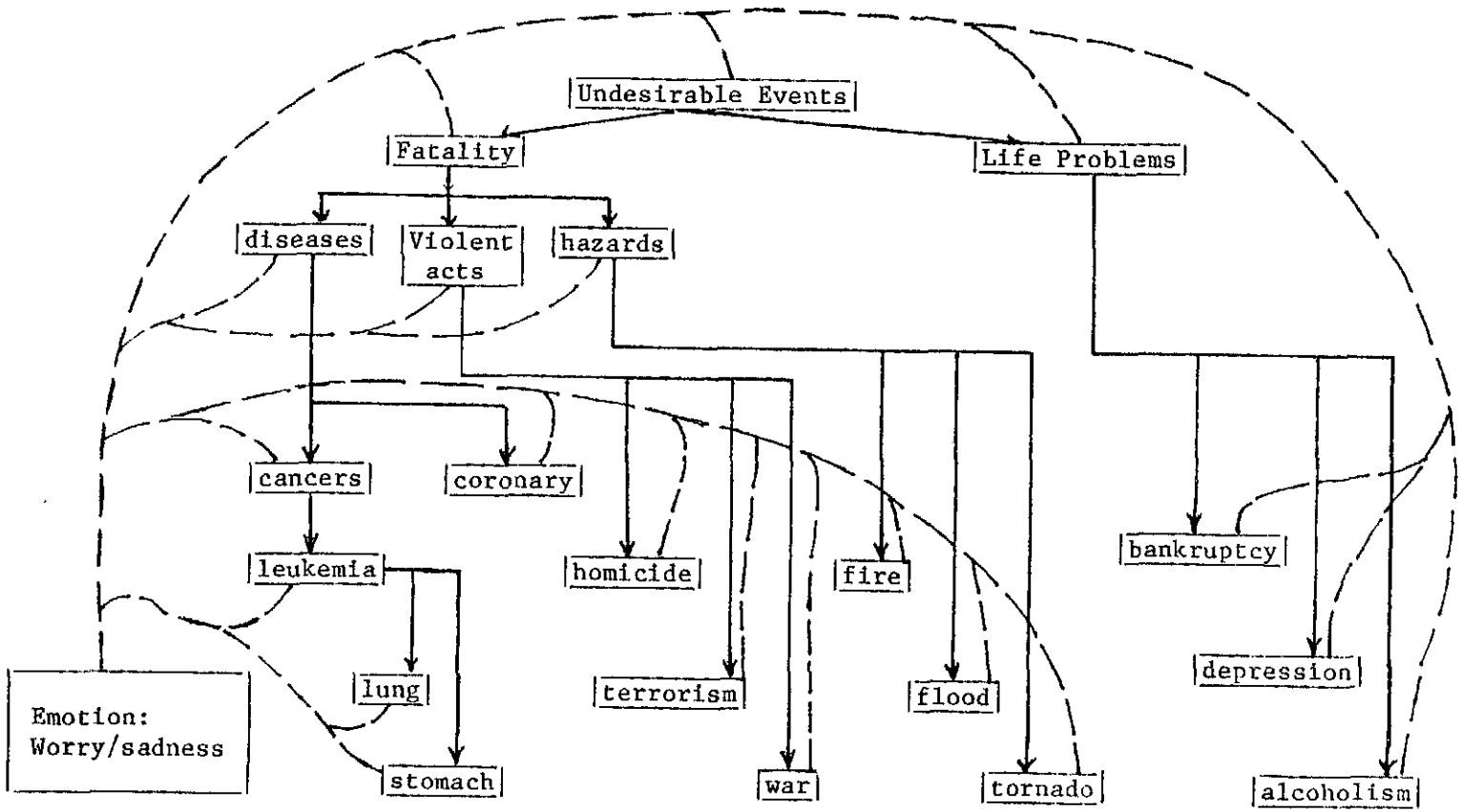
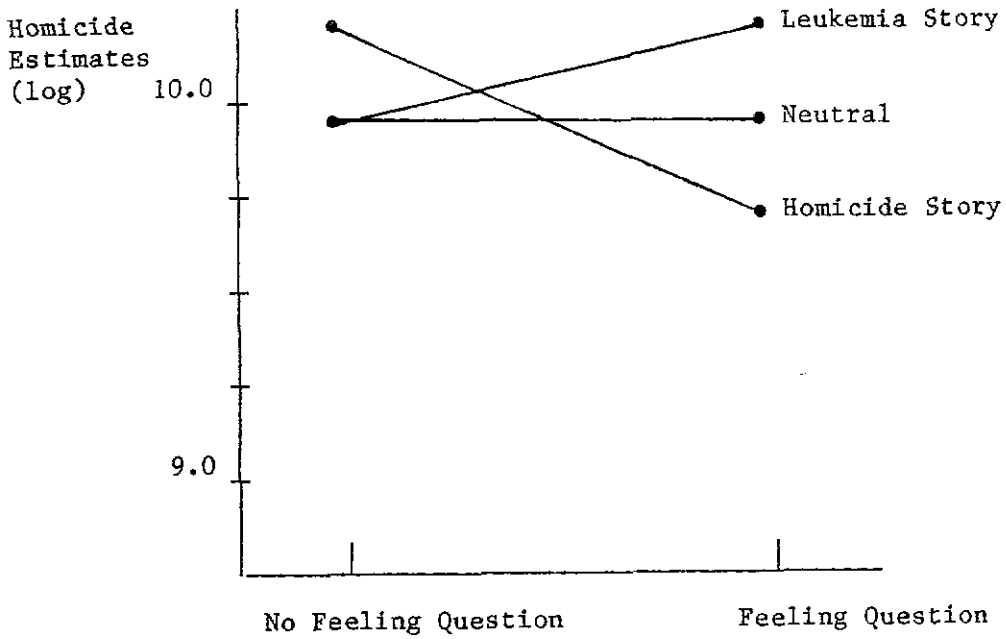


Figure 1. An example of portions of the network involved in Johnson and Tversky paradigm (Fatality structure adapted from Johnson and Tversky, 1983 and 1984).



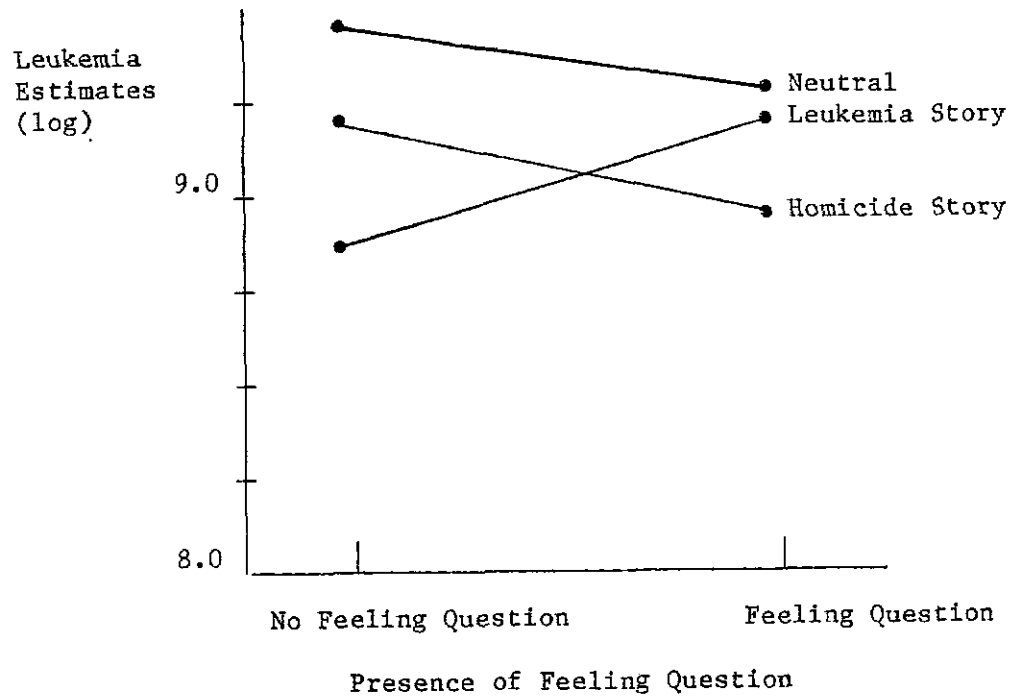
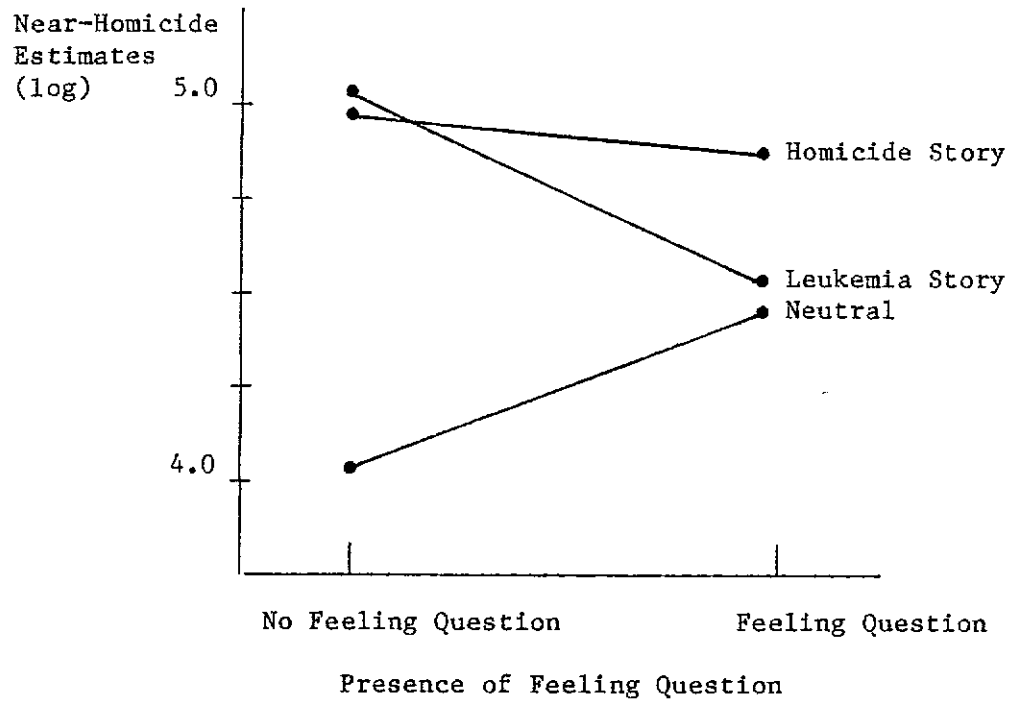


Figure 2-A: Homicide and Leukemia risk estimates for type of story and feeling question conditions in Experiment 1 (collapsed over order).



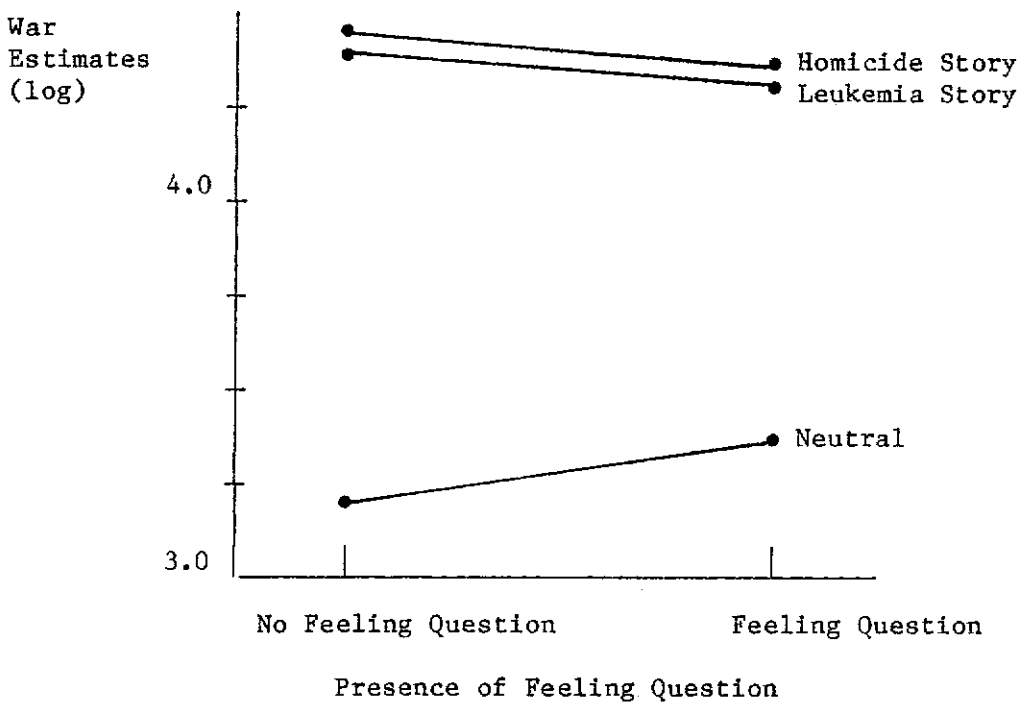
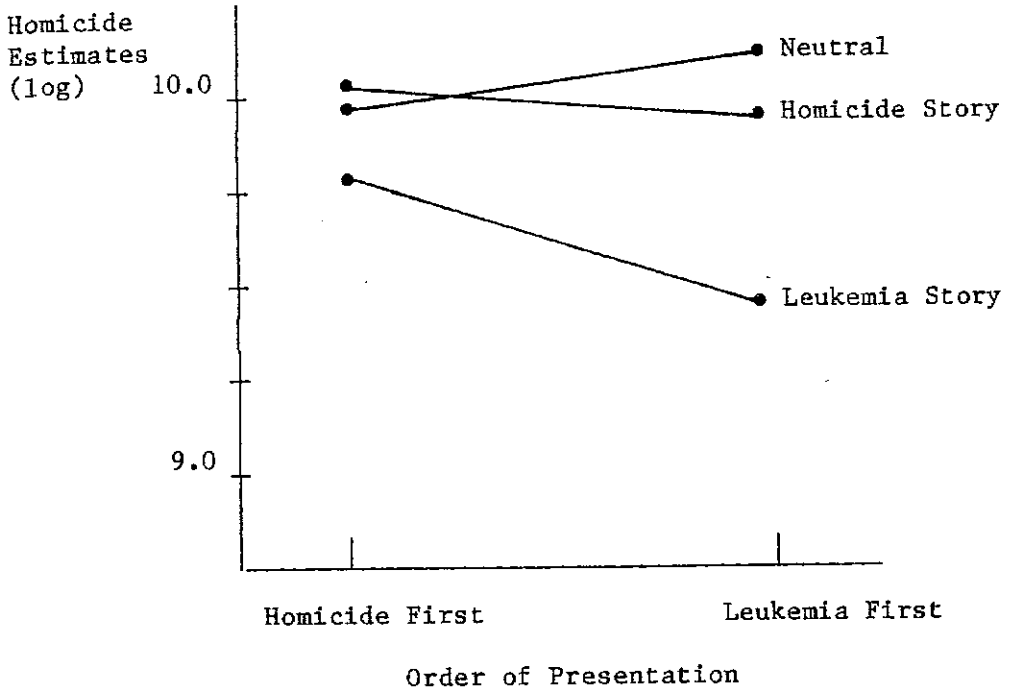


Figure 2-B: Near-Homicide and War risk estimates for type of story and feeling question conditions in Experiment 1 (collapsed over order).



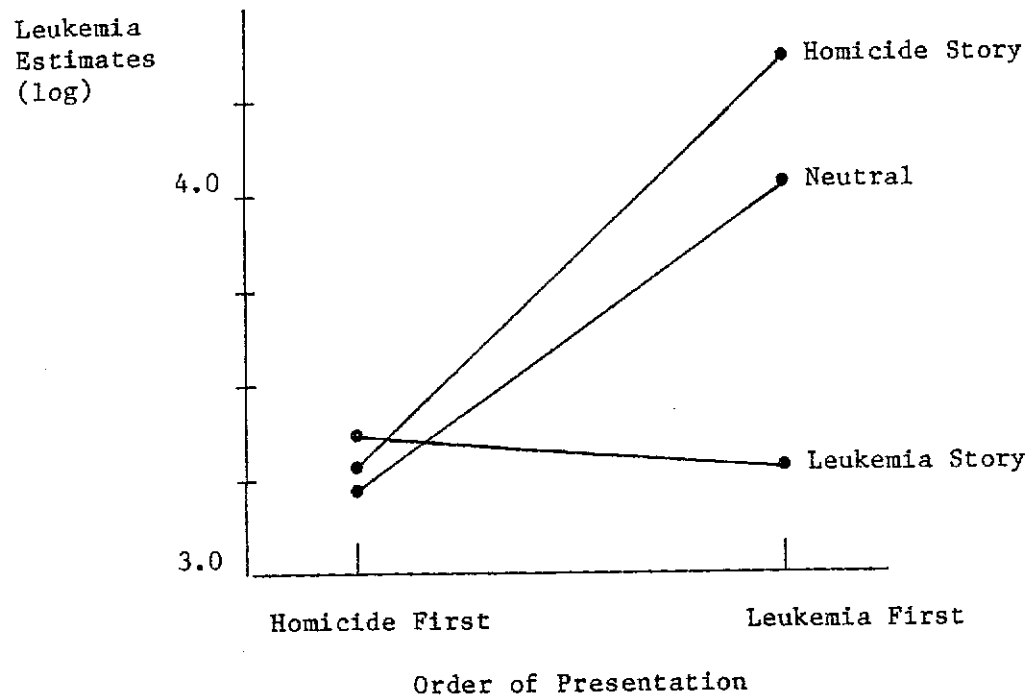


Figure 3-A: Homicide and Leukemia estimates for type of story and order of presentation conditions in Experiment 2 (collapsed over feeling).

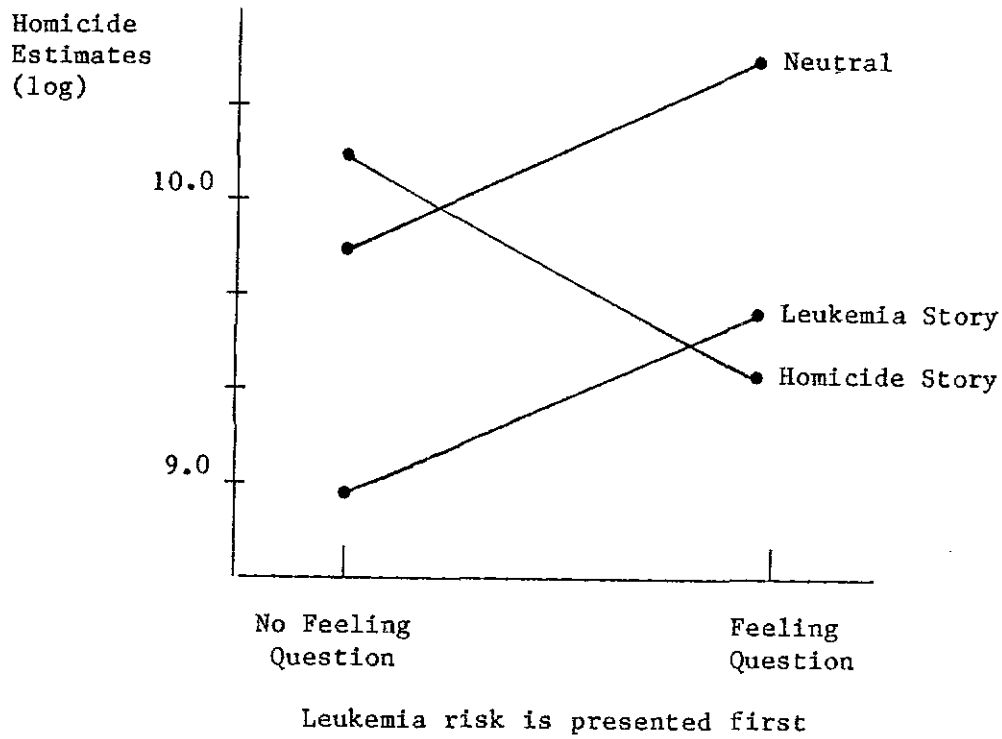


Figure 3-B: Homicide estimate for type of story and feeling question conditions when Leukemia was the first risk presented in Experiment 2.

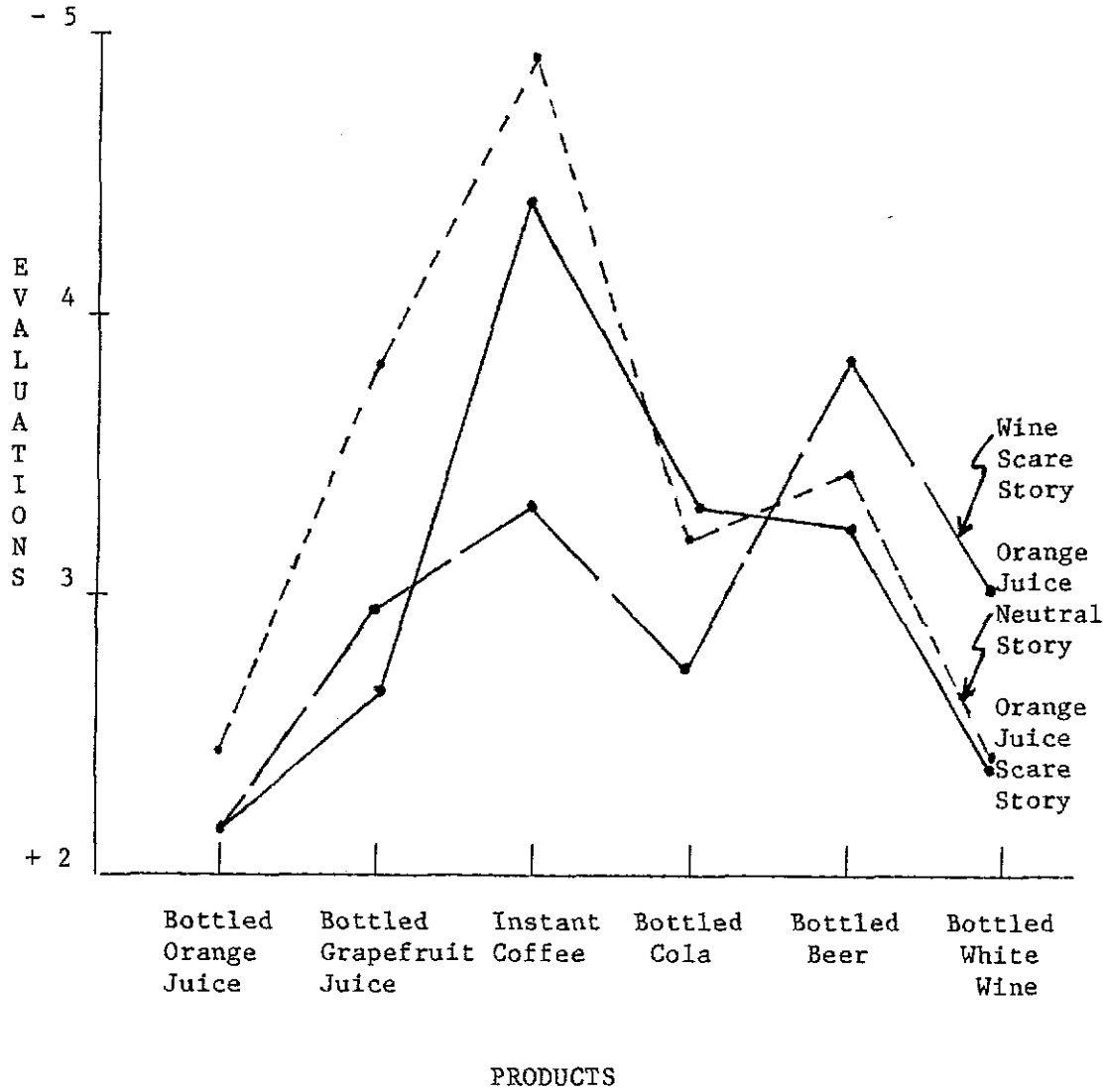
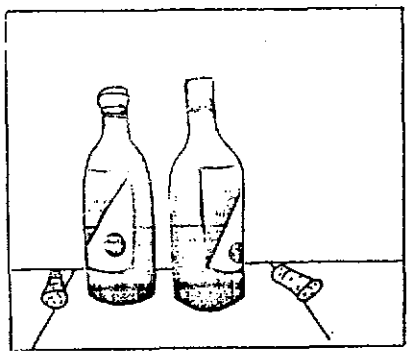
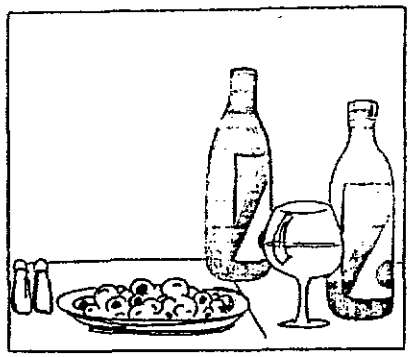


Figure 4: Evaluations of six beverages for different story conditions in Experiment 3.

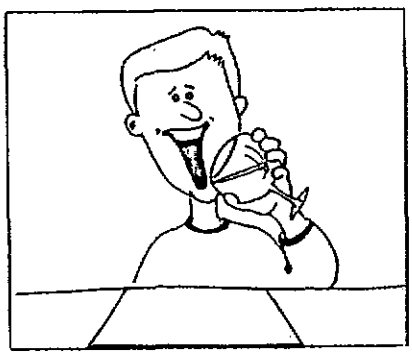


BRAND X WINE COMES TO YOU FROM CALIFORNIAN VINEYARDS.

IT HAS A NUMBER OF VARIETIES.



ITS SMOOTH TASTE COMPLEMENTS ALL FOODS.



IT IS MEDIUM DRY.

OUR WINES ARE PRICED COMPETITIVELY AND WIDELY AVAILABLE IN LIQUOR STORES.

Figure 5. Storyboard for wine commercial

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