

Mood and Information Processing: When Happy and Sad Look the Same¹

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Two studies were conducted to demonstrate that sad and happy moods can cause individuals to be similarly sensitive to the valence of observed stimuli with regard to how effortfully such stimuli are processed. In Study 1, individuals in whom a sad or happy mood had been induced unitized a behavior sequence less finely when its contents were neutral as opposed to positive. Individuals in a neutral mood state maintained a comparable level of unitization regardless of the valence of the behavior sequence. In Study 2, individuals in whom a sad or a happy mood had been induced processed the arguments in a persuasive communication more extensively when its contents were affectively uplifting rather than depressing. Sad individuals showed this pattern only if no prior affective expectation was provided. Taken together, these studies may fit with the notion that under certain conditions sad and happy individuals similarly decrease the amount of information processed from a neutral (Study 1) or depressing (Study 2), relative to a positive, stimulus.

KEY WORDS: mood; information processing; unitization; persuasion; stimulus valence.

Cialdini, Darby, and Vincent's (1973) Negative State Relief (NSR) model proposes that individuals experiencing sad moods are motivated to relieve their unpleasant affective state and, therefore, engage in activities capable of relieving their sad

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mood. Supporting their model, Cialdini et al. (1973) found that sad participants helped an individual in need (a presumably uplifting experience) more often than both control participants and sad participants who had encountered a mood-repairing experience prior to the helping opportunity. Such attempts at affect repair have been found to involve not only behavioral strategies (e.g., helping others; Cialdini et al., 1973; Schaller & Cialdini, 1990) but also cognitive strategies (e.g., summoning happy memories; Boden & Baumeister, 1997). Drawing on this work, Lassiter, Koenig and Apple (1996) suggested that sad individuals may evoke a cognitive strategy in which they are motivated to effortfully process positive (i.e., mood-elevating), but not neutral or negative (i.e., non-mood-elevating), behavioral information. Specifically, if sad participants are shown a positive behavioral sequence, they extract as much positive information from this sequence as possible because doing so could potentially enhance their mood. However, if sad participants are shown a neutral or negative behavioral sequence, they are not particularly motivated to extract information because doing so would not readily elevate their mood. Therefore, sad participants have little motivation to effortfully process nonpositive information (cf. Hertel & Hardin, 1990).

Lassiter et al. (1996) used Newtonson's (1973, 1976, 1980) unitization procedure to provide evidence of such differential processing for individuals in a sad mood. Briefly, unitization is an online measure of the number and location of discrete actions within an observed behavior sequence that individuals identify as meaningful. Considerable evidence indicates that finer unitization rates (i.e., identifying more meaningful actions within a behavior sequence) correspond to higher levels of information gain relative to grosser unitization rates (Geers & Lassiter, 1999; Lassiter, 1988; Lassiter, Geers, & Apple, 2002; Lassiter, Geers, Apple, & Beers, 2000; Lassiter & Slaw, 1991; Lassiter, Stone, & Rogers, 1988; Newtonson & Rindner, 1979). For example, Lassiter et al. (1988) found, across three experiments, that participants unitizing finely exhibited better memory for an observed other's behavior than those unitizing grossly. Additionally, several studies suggest that finer unitization rates correspond to greater levels of information processing relative to grosser unitization rates (Lassiter, Briggs, & Bowman, 1991; Newtonson, 1976; Russell, 1979). For example, Lassiter et al. (1991) found that individuals high in need for cognition (i.e., those who enjoy engaging in effortful analytic processing; Cacioppo & Petty, 1982) tend to segment behavior sequences more finely and recall more actions than those low in need for cognition. Such data support the notion that individuals control the quantity of information gained and processed from a behavior sequence by adjusting their unitization rate.

Research also indicates that individuals regulate the quality, or kinds, of information extracted from a behavior sequence by varying their unitization pattern (i.e., points in time at which individuals indicate a meaningful behavior has taken place; Engquist, Newtonson, & LaCross, 1979; Geers & Lassiter, 2002a; Lassiter

et al., 2000; Massad, Hubbard, & Newton, 1979; Newton, Rindner, & Campbell, 1979). For example, multiple investigations (Cohen & Ebbesen, 1979; Lassiter et al., 2000) have found that individuals whose observational goal was to learn an actor's task behavior identified a different set of action units as meaningful than did individuals whose goal was to form an impression of the actor. This result seems reasonable in that the specific actions that help an individual learn a task versus form an impression are likely not the same. On the basis of the above and similar findings, Lassiter et al. (1996) argued that the unitization procedure can provide a means of measuring the amount and type of information gained and processed by individuals depending on their current moods and the information to which they are attending (see Lassiter et al., 1996, for further discussion of the unitization paradigm and its application to the investigation of mood effects on information gain and processing).

Supporting the notion that individuals experiencing a sad mood sometimes process information at a low level, Lassiter et al. (1996, Study 3) found that, after participants were induced into a sad, neutral, or happy mood via the Velten (1968) procedure, sad participants unitized a seemingly neutral behavior sequence at a significantly lower rate than those in a positive or neutral mood (who unitized at comparable rates). In Lassiter et al.'s (1996) Study 5, participants were categorized as sad or not sad according to their responses to the Beck Depression Inventory (BDI; 1967). Again, it was found that, relative to those categorized as not sad, sad participants unitized behavior sequences of a woman behaving with sad or neutral affect at a grosser level and recalled fewer behaviors from these sequences. However, supporting the notion that individuals in a sad mood can sometimes gain and process high levels of information, sad participants increased their unitization rates and recall when watching a person in an elated mood. No differences in unitization pattern emerged in these studies, which indicates that mood affected the quantity, but not quality, of information processed. In sum, the results of Lassiter et al.'s (1996) Studies 3 and 5 are consistent with the NSR model; relative to nonsad participants, sad participants processed information capable of relieving their sad mood (i.e., the positive behavior sequence) at a higher level but processed information incapable of repairing their mood (i.e., the neutral and negative behavior sequences) at a lower level.

Prior research investigating the effects of sad mood on cognitive processing has generated mixed results. Several findings indicate that individuals experiencing a sad mood suffer cognitive impairments as evidenced, for example, by their decreased memory (Ellis, Thomas, & Rodriguez, 1984; Hasher & Zacks, 1979; Jackson & Smith, 1984; Potts, Camp, & Coyne, 1989; Weingartner, Cohen, Murphy, Martello, & Gerdt, 1981), limited hypothesis generation (Abramson, Alloy, & Rosoff, 1981; Alloy & Abramson, 1979), and low-effort style of causal attribution (Conway & Sullivan, 1990; Sullivan & Conway, 1989). However, other researchers have found evidence suggesting that sad mood can improve cognitive

performance. For example, those experiencing a sad mood generate more on-line inferences about others (Edwards & Weary, 1993), consider more carefully the merits of the arguments within a persuasive communication (e.g., Schwarz, Bless, & Bohner, 1991), and form more accurate judgments from correlational data (Sinclair & Mark, 1994). The results of Lassiter et al. (1996) suggest that instead of contradicting each other, these findings indicate that the motivational considerations of sad participants and the affective qualities of stimuli may be responsible for observed increases or decreases in cognitive performance.

WHAT ABOUT POSITIVE MOOD?

Much of the research investigating the effects of positive moods on cognitive processes suggests that several cognitive advantages accompany the experience of positive affect (see Isen, 1993). For example, suggesting better cognitive organization, happy individuals demonstrate a broader range of associations and more diverse associations relative to controls (Isen, 1985). Consistent with this notion, happy individuals tend to be more cognitively flexible and, therefore, more readily find ways to fit atypical members into a category (e.g., Isen & Daubman, 1984; Isen, Niedenthal, & Cantor, 1992). The cognitive advantages that accompany positive mood have even been demonstrated in negotiation tasks involving integrative bargaining, tradeoffs, and resourceful thinking (Carnevale & Isen, 1986). Interestingly, the advantages of the improved cognitive organization experienced by happy individuals tend to be observed only for positive and neutral categories. When negative categories are examined, relative flexibility and heightened associations are not present (Isen et al., 1992). Similarly, the cognitive advantage of a positive mood disappears while engaging in negative tasks. For example, Isen and Simmonds (1978) have demonstrated that, relative to neutral controls, happy individuals help someone more if the task involves uplifting information but help less if the helping task involves mood-depreciating information. Thus, Isen and Simmonds (1978) have suggested that happy individuals' avoidance of negative information stems from a motivation to maintain their pleasant mood.

Other evidence suggests that positive affect also promotes both intrinsic motivation and variety seeking within relatively benign situations (Kahn & Isen, 1993). However, if something negative within one's environment is salient, happy individuals do not differ from controls on intrinsic motivation and variety seeking. Demonstrating heightened intrinsic motivation for tasks that are not mood-depreciating, happy participants have been observed to persevere longer than controls on an interesting, but not a boring, task (Estrada, Young, & Isen, 1992; cited by Isen, 1993), unless they knew the boring task had to be completed (Isen & Reeve, 1992; cited by Isen, 1993). These findings support the notion that, unless a task is also described as being important, happy individuals tend to experience heightened

intrinsic motivation for tasks which, at the same time, satisfy mood-maintenance motives.

Isen (1993) has suggested that happy individuals may appraise their situation and determine whether it is benign enough to allow the pursuit of enjoyment (i.e., mood maintenance) or requires effortful avoidance of harm or mood depreciation. Consistent with this suggestion, Isen and Patrick (1983) found that, relative to controls, happy participants were risk seeking (i.e., made risky bets) in a benign hypothetical gambling situation but were risk averse (i.e., made less risky bets) when making actual gambles. Isen and Patrick suggested that happy participants had, affectively speaking, more to lose than control participants, because losing a real bet would decrease their mood from an already positive level. Thus, risk aversion is consistent with the notion that happy individuals are motivated to maintain positive mood.

Interestingly, Isen and colleagues (Isen & Means, 1983; Isen, Rosenzweig, & Young, 1991) have obtained evidence suggesting that, in complex decision-making tasks, happy individuals are more intrinsically motivated and make judgments more efficiently than control participants. For example, in a decision-making task in which participants had to choose one of six possible cars to buy, happy participants chose the best car more quickly than controls (Isen & Means, 1983). Additionally, demonstrating increased intrinsic motivation and processing efficiency, Isen et al. (1991) found that, relative to controls, happy medical students determined which of six patient descriptions was most indicative of lung cancer earlier and they tended to diagnose and recommend treatments for all of the patients more often.

Contradicting these findings, some persuasion researchers have obtained evidence suggesting that positive affect leads to lower levels of systematic processing and increased reliance on heuristic processes in determining attitude (Mackie & Worth, 1989; Worth & Mackie, 1987). However, more recent findings suggests that what appeared to be a cognitive deficit for happy individuals is more likely a lack of motivation to engage in the particular materials at hand (e.g., Bless, Bohner, Schwarz, & Strack, 1990). Recognizing this point, Wegener and Petty (1994) have proposed a mood-maintenance framework that largely coincides with the persuasion literature as well as the positive affect and cognition literature.

THE HEDONIC CONTINGENCY HYPOTHESIS

In Wegener and Petty's (1994) Hedonic Contingency Hypothesis (HC hypothesis), different reward contingencies are argued to operate for those experiencing sad and happy moods. It is suggested that, for individuals experiencing a sad mood, engaging in almost any activity would likely result in a less negative mood than their current mood state. Therefore, rewards are likely without careful

consideration of the hedonic consequences of one's actions and, therefore, differential attention or scrutiny to the affective qualities of information or activities should not readily occur (cf. Cialdini et al., 1973; Lassiter et al., 1996). However, for those experiencing a positive mood, only a narrow range of activities can maintain or elevate mood; attending to most information or engaging in most activities would lead to a less positive mood and would, hence, be punishing. Therefore, to experience rewards, happy individuals come to learn that they must adopt a mood-maintenance strategy in which they carefully select information to process or activities in which to engage that will allow them to maintain or elevate their positive mood. Happy individuals should, therefore, actively process positive information but should, relative to sad- and neutral-mood individuals, process other types of information (e.g., negative or neutral) at a lower level.

Wegener, Petty, and Smith (1995, Study 2) demonstrated support for the HC hypothesis with a persuasion experiment. In their experiment, the authors presented to happy and sad participants either a depressing (counterattitudinal) or an uplifting (proattitudinal) persuasive message. They found that happy participants scrutinized the content of the persuasive communication to a greater extent when it was uplifting relative to depressing and, therefore, were more persuaded by strong than weak arguments to a greater extent when the message was uplifting than when it was depressing (i.e., there was a Message Content \times Argument Quality interaction). However, sad participants scrutinized the communication regardless of whether it was uplifting or depressing and, therefore, formed more favorable attitudes if they read strong arguments than weak ones. Supporting the HC hypothesis, sad individuals did not base their level of processing on the affective qualities of the communication whereas happy individuals did. That is, happy individuals engaged in effortful processing of materials that were capable of maintaining or elevating mood but did not engage in effortful processing of materials that could decrease mood.

As Wegener et al. (1995) have suggested, motivations other than mood repair or mood maintenance could potentially influence the extent to which individuals experiencing a positive mood process information. A strong form of the HC hypothesis would suggest that mood maintenance is the primary motivation for those experiencing a happy mood. However, a wealth of evidence has demonstrated that happy individuals will sometimes carefully process negative information. For example, evidence indicates that happy individuals process negative information when it is pressing and important (Isen, 1993; Isen, Shalker, Clark, & Karp, 1978) or self-relevant (e.g., Trope & Pomerantz, 1998). Also, happy individuals effortfully process when they are specifically asked to carefully examine information (i.e., when information processing is the stated goal; Bless et al., 1990; Bodenhausen, Kramer, & Susser, 1994). After reviewing such results, Aspinwall (1998) proposed a moderated HC hypothesis in which happy individuals are expected to avoid, or decrease, the processing of negative (and presumably neutral) information *unless* that information is useful to other operative goals.

SOME APPARENT DISCREPANCIES BETWEEN THE HEDONIC CONTINGENCY HYPOTHESIS AND THE RESULTS OF LASSITER ET AL.'S (1996) HAPPY PARTICIPANTS

Inconsistent with Wegener et al.'s (1994, 1995) HC hypothesis, Lassiter et al. (1996, Study 3) found that happy participants, unlike sad participants, processed a neutral, potentially mood-depreciating stimulus in an effortful fashion. One possible explanation for this finding is that Lassiter et al.'s (1996) positive-mood participants were not especially happy. For instance, in their Study 3, it is evident that sad participants' reported affect was farther away from the midpoint of the mood scale than the reported affect of those experiencing a positive mood. Therefore, although positive mood participants were feeling better than those in a sad mood, their affective state might not have been so positive that careful processing of a neutral behavior sequence would have appreciably decreased their mood. Similarly, in Lassiter et al.'s (1996) Study 5, the non sad participants may have been experiencing largely neutral affect. If that were the case, this experiment could not have determined how individuals in a clearly positive mood respond to negative, neutral, and positive stimuli.

STUDY 1

Rationale and Predictions

Study 1 was an attempt to demonstrate that both Lassiter et al.'s (1996) results for sad people and Wegener et al.'s (1994, 1995) results for happy people can be obtained within a single experiment. To do this, a methodology similar to that used in Lassiter et al.'s (1996) Study 5 was adopted. In Study 1, participants were asked to unitize either a positive or neutral video and subsequently report their video recall. However, instead of measuring affect with the BDI as was done by Lassiter et al. (1996, Study 5), moods were manipulated using articles that have induced clearly positive, neutral, and sad moods in previous research (e.g., Wegener & Petty, 1994). We argue, as did Lassiter et al. (1996), that by comparing the unitization rates and number of events recalled by happy, neutral, and sad individuals for a neutral or positive video, conclusions can be drawn about the degree to which individuals in different moods process and gain information from differently valenced stimuli.

Consistent with the NSR model (Cialdini et al., 1973) and the findings of Lassiter et al. (1996)—but not necessarily the HC hypothesis—sad participants were hypothesized to process a video at a low level unless it was capable of repairing their sad mood. It was expected, therefore, that participants in a sad mood would gain and process less information from a neutral video than a positive video. Consistent with the HC hypothesis—but not necessarily the NSR model—participants experiencing a positive mood were also expected to gain and

process less information from a neutral (potentially mood depreciating) video relative to a positive (potentially mood maintaining or elevating) video. Participants in a neutral mood (i.e., control participants) were expected to gain and process information from both videos comparably, because Lassiter et al.'s (1996) research indicated that such individuals did not alter their processing strategies in response to the valence of the target stimuli. It was additionally hypothesized that if carefully processing the video would allow individuals to maintain or repair their mood (i.e., the video is positive), happy and sad participants will gain and process at least as much information as neutral controls. However, for the neutral video, happy and sad participants were expected to gain and process less information than neutral controls.

Carefully processing a negative stimulus, like a neutral stimulus, should not allow happy or sad individuals to maintain or relieve their mood. Therefore, a negative stimulus was not presently investigated as results would be expected to largely mirror those found with a neutral stimulus. Although previous research has found that happy individuals carefully process neutral information if they are told it is important for them to do so (see Isen, 1993), participants in Study 1 simply watched a video and were asked to indicate occurrences within the video that were meaningful to them. Because the instructions for the unitization task emphasized that it was up to the participants to decide what was meaningful to them, it is unlikely that participants experienced any demand to effortfully process the videos. Furthermore, neutral stimuli have not, to date, been used to test the HC hypothesis. Therefore, finding that happy individuals also process neutral information at a lower level than uplifting information (given no competing task motivations are operative) would lend strong support to the HC hypothesis.

Method

Participants

Completing experimental sessions individually, 167 male introductory psychology students at Ohio University served as participants to partially satisfy course requirements. It was decided before the experiment was conducted that it would be undesirable to use the data from individuals who had seen the movie from which the stimulus clips were taken ("Young Frankenstein, Gruskoff & Brooks, 1974") because they may have had an expectation as to how these clips would make them feel, recall more events, and enjoy the stimulus clips more than those who have not had previous exposure. Therefore, the number of participants who had seen the movie was recorded for each condition and the experiment was run until there were approximately 20 participants who had not seen "Young Frankenstein" in each of six conditions. This procedure resulted in a total of 124 participants.

To insure that the videos prepared for this study differed in how positively they were perceived, a pilot study was conducted. Means from these data indicated

that female participants did not differentiate between the tapes that were meant to be neutral and positive (perhaps women find black-and-white Frankenstein movies less enjoyable than men). The tapes were rated differently by males and showed the anticipated pattern in ratings of positivity. For this reason, only males were used in this experiment.

Design

The experiment was a 3 (mood: happy vs. neutral vs. sad) by 2 (valence of unitized stimulus: neutral vs. positive) between-subjects design with rate of unitization and number of occurrences recalled as the primary dependent measures.

Procedure

Participants were greeted by a male experimenter upon their arrival. They were told that there would be three separate experiments. The experimenter informed the participants that the first experiment was being conducted for a colleague to see if a certain short video (which was only a practice video) would be appropriate for use in future research. To clarify, the experimenter explained that the colleague was interested in how people segment occurrences within this video. Detailed unitization instructions (see below), adapted from Ploutz-Snyder (1998), were read. These instructions also informed the participants that they would be doing this same task later with a different video in the third experiment. After these instructions were read, the participants watched and unitized a short practice video. This portion of the experiment served to familiarize the participants with the unitization procedure.

After the practice video, participants were told that the second experiment would investigate people's imagery ability for written materials. Participants were then told that they were going to read a short article (mood manipulation) and then fill out a questionnaire about that article (mood-manipulation check, see Wegener & Petty, 1994). Once these instructions were read, the experimenter handed the participants two numbered folders. The first folder contained detailed instructions about the imagery task and one of three mood-manipulation articles. The second folder contained a questionnaire ostensibly designed to assess qualities of the article and how well the participants were able to imagine what was in the article (as in Wegener & Petty, 1994). Embedded within the questionnaire were three items designed to assess the participants' mood. The mood-manipulation article and the mood manipulation check were put in separate folders so that the participant could not refer to the article while responding to the questionnaire.

Once the questionnaire was completed, the experimenter briefly reiterated the unitization instructions and then asked the participants to unitize the stimulus video. Once the stimulus video began, the experimenter left the room until

the video's conclusion. Next, the experimenter handed the participants another questionnaire packet that included questions designed to assess how positively participants evaluated the video and a page for participants to write down as many events from the video clip as they could recall. After completing this last packet, participants were debriefed and thanked for their participation.

Although a systematic probing for suspicion did not take place, several participants were verbally probed for suspicion and asked if they thought they knew the purpose of the experiment. Few participants thought the experiment had something to do with mood and none of these participants correctly guessed the predictions of the experiment or expressed suspicion about the methods or the fact that they engaged in the unitization task twice.

Mood Manipulation. Participants' mood was manipulated using the same articles used by Wegener and Petty (1994, Study 2) to induce happy, neutral, and sad moods. The article serving as the sad-mood induction ("Cameroon's Valley of Death") describes a tragic natural disaster. The article serving as the neutral-mood induction ("Chicago Bounces Back") describes the economic recovery of Chicago. The article serving as the positive-mood induction ("Meeting Them More than Halfway") describes an event in which two couples were reunited at a very friendly restaurant.

Mood-Manipulation Check. The same mood-manipulation-check questionnaire used by Wegener and Petty (1994) was completed immediately following the mood-manipulation article. It included filler questions about the article and three questions designed to assess mood. These latter questions asked participants to indicate on 15-point scales how good/bad, pleasant/unpleasant, and positive/negative they felt. The average of these scales, which demonstrated a high level of internal consistency ($\alpha = .82$), served as the mood measure.

Unitization Task. Unitization instructions were given at the beginning of the session after participants were informed that the first experiment would involve segmenting the occurrences within a video. These instructions, adapted from Ploutz-Snyder (1998), read as follows:

Now I am going to read you some instructions for the first experiment. Please pay close attention. If you have any questions, please be sure to ask me when I am finished reading these instructions. During this session, you will be watching two videos, one for the first experiment and another one for the third experiment. Although these are different experiments, the instructions for each are identical. We are interested in how people perceive the behavior of others. So, while you are viewing the videotape, I would like you to record for me all of the meaningful occurrences that you see in the sequence. To do this, simply press this [computer] mouse button when, in your judgment, a meaningful occurrence takes place. Let me explain what I mean by that. Consider, for example, the fact that I am reading instructions to you right now. This behavior includes things like, sitting in front of you, reading instructions, talking out loud to you, making eye contact and other gestures, listening to anything that you might say, and answering your questions. You could see each of these as discrete and meaningful occurrences. Or, you might see the same behavior as being composed of only three things; sitting, reading out loud, and responding. Finally, you might see this behavior as only one thing—that of communicating instructions. What I would like *you* to do as you view this videotape is to segment the behavior into

the occurrences that seem natural and meaningful to you. Simply press the mouse button whenever, in your judgment, one meaningful occurrence ends and another begins. As I said before, these should be occurrences that seem natural and meaningful to you. Let me stress that there is no right or wrong way to do this. We are simply interested in how you do it.

At this time participants were handed a computer mouse to press. The mouse button activated a computer program that recorded how often (unitization rate) and at what point in time (unitization pattern) the participant pressed the mouse button. Because the purpose of the “first experiment” was to familiarize the participants with the unitization task, the button presses for this video were not actually recorded. For the “third experiment,” the button presses were recorded. Additionally, before participants actually engaged in the second unitization task, they received a brief reminder about how to unitize (see last paragraph of the unitization instructions above).

Recall Measure. After the unitization task, participants completed a final questionnaire that included a page on which they were asked to write down as many aspects of the clip as they could remember. The number of correctly remembered items was counted to produce a total recall score for each participant. This recall measure provides an additional indication of the amount of information gained from the video sequences.

Stimulus Videos. Participants unitized either a neutral or positive video segment taken from the movie “Young Frankenstein.” The videos were fairly short (approximately 2.5 min) to minimize the possibility of significantly altering mood. The neutral clip begins with Dr. Frankenstein and his two assistants noting a light coming from under a door at the bottom of a staircase. They then slowly and quietly descend the staircase located in a dimly-lit and spider-web-filled room. Once inside the door, they look around and notice a violin and a cigar recently left by an unknown individual. Eventually they realize that they are in the secret library of the original Dr. Frankenstein and the young Dr. Frankenstein begins to melodramatically read excerpts from a book entitled “How I Did It,” while the assistants uninterestedly listen. After reading the book, Dr. Frankenstein yells “It can’t work!” and the clip ends.

The positive clip begins with Dr. Frankenstein throwing darts. Finishing his turn, Dr. Frankenstein pours himself a drink as a constable questions him about the suspected presence of monsters in his home. As Dr. Frankenstein prepares a drink, the constable punctures his prosthetic arm with a handful of darts. Noticing Dr. Frankenstein’s back is turned, the constable sticks the darts into the bull’s-eye, after which he produces sounds to make the doctor believe that the darts were actually thrown. Once it is again Dr. Frankenstein’s turn, the constable speaks jarringly every time a dart is thrown, causing the darts to miss the target and, in one instance, hit a cat. Finally, Dr. Frankenstein mentions that he is tired, they conclude the game, the constable leaves, and the clip ends.

Results

Manipulation Checks

Participants' ratings of how good/bad, pleasant/unpleasant, and negative/positive they felt after reading the mood-manipulation articles were averaged to create a mood index. This mood index was analyzed using an analysis of variance (ANOVA) with mood manipulation and stimulus video as between-subjects factors. This analysis revealed a significant main effect of the mood manipulation, $F(2, 118) = 41.73, p < .001$, and no significant main effect of stimulus video or Mood \times Video interaction (both F s < 1). To assure that both the sad and positive mood-manipulation articles produced moods significantly different from those induced by the neutral mood-manipulation article, specific comparisons were conducted. As expected, participants who read the sad mood-manipulation article reported being in a significantly less positive mood ($M = 4.64$) than those who read the neutral mood-manipulation article ($M = 9.42$), $t(83) = 4.66, p < .001$. Additionally, participants who read the positive mood-manipulation article reported being in a significantly more positive mood ($M = 12.79$) than participants who read the neutral mood-manipulation article, $t(78) = 3.15, p < .002$.

To assess how positively participants evaluated the videos, their video ratings, unfunny/funny, unpleasant/pleasant, and nonenjoyable/enjoyable, were averaged ($\alpha = .79$). These data were entered into an ANOVA with mood and video as between-subjects factors. This analysis yielded a main effect of video such that the positive video ($M = 10.32$) was rated more positively than the neutral video ($M = 9.27$), $F(1, 118) = 7.20, p < .01$. Neither the main effect of mood ($F < 1$) nor the Mood \times Video interaction ($F[2, 118] = 1.93, p = .15$) attained significance, suggesting that across moods, individuals differentiated the affective quality of the neutral and positive videos.

Unitization Measure

Unitization rate was entered into a 3 (mood: sad, neutral, or positive) \times 2 (stimulus video: neutral vs. positive) ANOVA. The analysis revealed no main effect of mood ($F < 1.41$). A main effect of video indicated that participants unitized the neutral video less than the positive video, $F(1, 118) = 11.30, p = .001$. Although the unfocused Mood \times Video interaction failed to reach significance, $F(2, 118) = 2.38, p = .10$, a priori paired comparisons were conducted to determine whether key means differed as predicted (see Table I for means and standard deviations).⁴

⁴To test the predicted interaction more precisely, a focused contrast was constructed, following Rosenthal and Rosnow (1985), with weights of $-2, 1, 1, 1, -2, 1$ for those in the sad mood/neutral video, sad mood/positive video, neutral mood/neutral video, neutral mood/positive video, positive mood/neutral video, positive mood/positive video conditions respectively. As expected, this contrast

Table I. Means (Standard Deviations) for Unitization and Recall Measures (Study 1)

Measure	Video	
	Neutral	Positive
<i>Sad</i>		
Unitization rate	8.30 (6.07) _{a,c,e,g}	15.83 (8.63) _{c,f}
Recalled events	9.40 (4.24)	10.92 (3.69)
<i>Neutral</i>		
Unitization rate	14.65 (7.98) _{a,b}	15.14 (8.26) _{e,h}
Recalled events	10.70 (3.59)	11.43 (5.06)
<i>Happy</i>		
Unitization rate	10.40 (6.24) _{b,d,f,h}	16.47 (8.78) _{d,g}
Recalled events	9.74 (3.03)	11.84 (5.15)

Note. Means with identical subscripts are significantly different from each other.

As expected, sad participants unitized the positive video more finely than the neutral video, $t(42) = 3.28, p = .002$. This effect was also observed for those experiencing a positive mood, $t(37) = 2.50, p = .017$. However, as expected, participants experiencing a neutral mood unitized the positive and neutral videos at comparable levels, $t(39) = 0.194, p = .847$. Additionally, for individuals who viewed the neutral video, neutral-mood participants unitized more finely than both sad ($t[38] = 2.83, p = .007$) and happy ($t[38] = 1.88, p = .034$, one-tailed) participants, and sad and happy participants did not unitize differently, $t(38) = 1.04, ns$). There were no differences among mood groups for those who watched the positive video (all $ts < 0.37$).

Recall Measure

The number of occurrences recalled from the videos was entered into the same ANOVA used for the unitization measure. The analysis revealed no main effect of mood ($F < 1$). A marginally significant main effect of video revealed that participants may have recalled less from the neutral video than from the positive video, $F(1, 117) = 3.66, p = .058$ (the recall measure was not completed by one participant). The unfocused, or default, Mood \times Video interaction failed to reach significance, $F < 1$.⁵ As was done for the unitization measure, a priori paired comparisons were conducted to determine if critical means differed as predicted

revealed that participants experiencing a positive or sad mood unitized the positive video at a level comparable to neutral-mood controls, but decreased unitization rate for the neutral video, $F(1, 118) = 17.10, p < .001$.

⁵With the same focused contrast used for the unitization measure, the predicted interaction was tested more precisely. As expected, this contrast revealed that participants experiencing a positive or sad mood recalled a comparable number of events from the positive video as neutral-mood controls, but recalled fewer events from the neutral video, $F(1, 117) = 4.14, p < .05$.

(see Table I for means and standard deviations). Although the pattern of means is consistent with predictions, none of the expected pairwise comparisons attained significance (all $t_s < 1.54$, *ns*).

Additional Analyses

If participants did not agree to some extent on what constitutes a meaningful occurrence, doubt would be cast on whether unitization rate is an adequate measure of the registration of meaningful information from the video stimulus. Additionally, participants in different mood states may have processed as meaningful systematically different aspects of the video.

To examine these points, an analysis of unitization pattern was conducted. Following a procedure used in previous unitization articles (Lassiter, 1988; Lassiter et al., 1996, 2000), each video clip was divided into 160 one-second intervals. For each participant, an interval was assigned the value of 1 if it contained a button press (thus indicating a meaningful occurrence took place) and a value of 0 if it did not. This data set was subjected to a 2 (video) \times 3 (mood) \times 160 (interval) between-within ANOVA. This analysis revealed a significant main effect for interval, $F(159, 18762) = 9.14$, $p < .001$, indicating that participants were largely in agreement as to which intervals within a given video were meaningful. Additionally, there was a significant Video \times Interval interaction, $F(159, 18762) = 6.49$, $p < .001$, which demonstrates, as would be expected, that the pattern of intervals identified as meaningful differed between the two tapes. Neither the Mood \times Interval nor the Video \times Mood \times Interval interactions attained significance (both $F_s < 1$), indicating that within each stimulus condition, those in happy, neutral, and sad moods identified essentially the same intervals as containing, or not containing, meaningful occurrences. The results of this analysis replicate the findings of Lassiter et al. (1996) and suggest once again that mood does not cause a systematic shift in the quality of information extracted from ongoing behavior.

Discussion

As mentioned in the Introduction, the positivity of participants' moods may not have been particularly high for participants in Lassiter et al.'s (1996) studies and, therefore, results consistent with the HC hypothesis were not obtained for happy participants. By manipulating participants' mood via a different means and by employing the unitization procedure, Study 1 was able to uncover how those in a clearly sad, neutral, or positive mood respond to differently valenced material.

As predicted, both happy and sad participants who watched a positive video unitized more finely than their happy or sad counterparts who watched a neutral video. Moreover, neutral-mood participants unitized both videos to a comparable

extent. Additionally, neutral-mood participants unitized the neutral video more finely than happy and sad individuals, who unitized at comparable rates. However, participants who watched the positive video unitized at comparable levels regardless of their mood. Thus, the hypotheses for Study 1 were confirmed using the primary dependent measure of Lassiter et al. (1996).

The patterns observed for the unitization measure were also observed for the recall measure, although they did not achieve significance (but see Footnote 5). Importantly, the recall measure was completed after the stimulus video was viewed and after participants had already spent time completing several pages of the questionnaire packet. It seems likely that participants' recall could have been attenuated by the time gap between watching the video and the time the recall measure was completed. Therefore, it is not surprising that the results for the recall measure, included as an additional indication of information gain, are less pronounced compared with the online unitization measure.

One curious pattern of results, observed in both the Lassiter et al. (1996) studies and Study 1, is that neutral-mood participants gained and processed information to the same extent regardless of stimulus valence. Although the motivational consideration may not be as salient for them relative to happy or sad individuals, it would seem that neutral-mood participants could also engender a pleasant mood state by processing more of the positive stimulus than the neutral one. However, as noted by Wegener et al. (1995, p. 6), it may be "that the value of mood as a signal for different reward contingencies depends on the mood being different from a normal (i.e., neutral) state." Thus, neutral-mood participants may not have varied their level of processing for the positive and neutral videos because the different reward contingencies endemic to these videos are not as salient to them as they are to those in happy and sad moods. Nevertheless, there may be some situations, including extreme positive or negative information or additional motivations or demands, in which neutral-mood individuals also vary processing level of available information. In Study 1, however, the results for the neutral-mood participants indicate that these participants did not base their level of processing on the affective qualities of the videos and that the amount of information within the two stimulus videos was comparable.

In sum, the results of Study 1 are congruent with the notion that individuals experiencing either a sad *or* positive mood are sensitive to the affective qualities of environmental stimuli relative to neutral-mood individuals. More specifically, consistent with the NSR model (Cialdini et al., 1973) and the studies reported by Lassiter et al. (1996), sad individuals seem to maintain a low level of information processing unless the information to which they are attending is positive enough to potentially repair their negative mood. Additionally, consistent with the HC hypothesis, happy participants, in whom no other goals have been triggered, appear to effortfully process information only if that information is positive enough that doing so will maintain or elevate their current mood. Still, it should be noted that, although Lassiter et al. (1996) and Wegener et al. (1994, 1995) found no

gender effects in their investigations (i.e., both males and females implemented mood maintenance or repair strategies), the results of Study 1 may, perhaps, only generalize to male individuals.

Finally, a reviewer raised the possibility that, at least for the neutral video, happy participants may have evidenced lower unitization rates than neutral-mood participants not because they extracted and processed less information as we have suggested, but because they organized the incoming information more efficiently (cf. Estrada, Isen, & Young, 1997). To evaluate this possibility, the correlation between unitization rate and the recall measure was computed for each of the six conditions. If unitization rate was not a valid indication of information gain, we would not expect it to correlate very well with the participants' subsequent recall of the videos. For participants who watched the neutral video, all correlations were positive, and were significant for neutral ($r = .572, p = .008$) and sad ($r = .621, p = .003$), but not happy ($r = .227, p = .18$, one-tailed), participants. For participants who watched the positive video, all correlations were positive, and were significant for happy ($r = .425, p = .035$, one-tailed), marginally significant for sad ($r = .319, p = .065$, one-tailed), and not significant for neutral ($r = .307, p = .088$, one-tailed), participants. Because the unitization and recall measures were not correlated significantly for happy participants watching the neutral video, the alternative interpretation involving organization of material rather than information gain cannot be ruled out. It should be noted, however, that none of the six correlations was significantly different from any other (using Fisher's r -to- z transformation, all Z s < 1.42). Such nonsignificant comparisons between correlations may be attributable to low statistical power (cell sizes ranged from 19 to 24 participants). However, it is also possible that, across conditions, participants were comparable in their relation between unitization and recall. To provide less equivocal support for our hypothesis, we used a more straightforward measure of effortful processing in Study 2.

SOME APPARENT DISCREPANCIES BETWEEN THE HEDONIC CONTINGENCY HYPOTHESIS AND THE RESULTS OF STUDY 1 (AND LASSITER ET AL., 1996) FOR SAD PARTICIPANTS

Interestingly, unlike the findings of Study 1 and Lassiter et al. (1996, Study 5), Wegener et al. (1995, Study 2) found that individuals experiencing a sad mood process information at a high level regardless of stimulus valence. That is, participants in a sad mood were more persuaded by strong than weak arguments irrespective of the valence of the message. We believe that an unexamined methodological difference may account for this discrepancy between Study 1 (and Lassiter et al., 1996) and Wegener et al.'s (1995, Study 2) findings. Whereas participants were not given any information about the affective qualities of the upcoming stimuli they were about to encounter in Study 1 or in the studies of Lassiter et al. (1996), Wegener et al. (1995, Study 2) forewarned participants that the primary quality

of the essay they were about to read was that it made students feel happy (for the uplifting message) or sad (for the depressing message). Thus, the affective qualities of the communications were confounded with congruent affective expectations about those communications. Therefore, it is unclear whether the results observed in Wegener et al.'s (1995) Study 2 resulted from the affective qualities of the messages, the expectations about the affective qualities of the messages, or whether these factors had additive or interactive effects on one another. In sum, because affective expectation is a notable difference between Study 1 (and Lassiter et al.'s [1996] research) and Wegener et al.'s (1995) Study 2, this factor may prove crucial in explaining the inconsistent findings for sad individuals between these studies.

Noting the importance of such affective expectations, Schwarz and Clore (1996) have suggested that happy participants would not carefully scrutinize a message *unless* the positive affective consequences of doing so were made apparent. That is, these authors believe that Wegener et al.'s (1995, Study 2) results depend on happy individuals receiving the forewarning that carefully thinking about an upcoming essay will make them feel happy. Schwarz and Clore further suggest, given that a sad mood serves as information and signals a problematic situation (e.g., Schwarz, 1990), it would be maladaptive to base decisions of processing level on the mere hedonic implications of materials. That is, according to Schwarz and Clore, the level of processing in which sad individuals should engage will be independent of the affective qualities of a message, regardless of the presence or absence of affective expectation.

Although affective expectations may be important in explaining some of the results of Wegener et al.'s (1995) Study 2, the manner in which these expectations influence information processing may contradict Schwarz and Clore's interpretation. In particular, the results of Study 1 demonstrate that even without experimentally provided affective expectations, happy participants vary online the extent to which they process information on the basis of the affective qualities of that information. Therefore, contrasting what Schwarz and Clore would predict for happy individuals, findings from our first study suggest that Wegener et al.'s (1995) Study 2 results would replicate for happy participants regardless of the presence or absence of affective expectations.

In agreement with Schwarz and Clore's explanation, persuasion research has consistently shown that without *intentionally* presented affective expectations, sad individuals effortfully scrutinize persuasive messages regardless of the affective qualities of those messages. Interestingly, Wegener et al.'s (1995) Study 2, the only mood and persuasion experiment to have intentionally provided affective expectations, resulted in this same indiscriminant processing trend for sad individuals. Nevertheless, the results obtained in Study 1 and Lassiter et al.'s (1996) research, that sad individuals process uplifting information more than neutral information *without the presence of an affective expectation* seems to contradict the notion that affective expectation is unimportant to sad individuals' information processing. To account for this apparent contradiction, we suggest that previous persuasion

research may in fact have inadvertently cued participants to the affective qualities of upcoming information.

Several major studies dealing with sad mood and persuasion highlight the methodological issue of unintentional inclusion of affective expectation for upcoming information. For example, in both studies presented by Bless et al. (1990), participants learned that there would be an increase in student fees occurring during the next academic year (which is likely a counterattitudinal fact and, according to Wegener et al.'s [1995] logic, a message supporting this position would be relatively depressing). Then, participants were presented 11 strong or weak arguments favoring this fee increase. Similarly, Bohner, Crow, Erb, and Schwarz (1991) had a confederate approach participants and inform them that she was from an organization that supported disabled students (a topic that arguably could either bring about sad feelings or annoy individuals who immediately link the woman's approach to a solicitation for money). Following this introduction (or negative expectation), the confederate offered one strong, or one weak, argument for the participant to make a donation to the organization. Finally, in a study conducted by Sinclair, Mark, and Clore (1994), an experimenter approached students, asked them to be part of a survey, then explained that they were advising the government about whether to implement senior comprehensive exams during the next academic year. The experimenter went on to explain the concept of the senior comprehensive exam (which was likely a counterattitudinal topic and, therefore, participants probably had the expectation that they would have negative feelings about the upcoming message), and participants then read three strong or weak arguments. Thus, although these researchers did not make it a point to inform participants about the primary affective qualities of the message they were about to encounter, it seems clear that participants were made aware that they were about to listen to a message regarding a presumably negative topic. The results of each of these studies, typical of studies in the mood and persuasion literature that find indiscriminately high levels of processing by sad individuals, was that sad participants effortfully processed the message presented and formed more favorable attitudes about the message if it was supported by strong as opposed to weak arguments.

Seemingly contrary to the above analysis, Kuykendall and Keating (1990) found results similar to these without readily noticeable affective expectations. These researchers had highly motivated sad, neutral, and happy participants read eight statements on senior comprehensive exams. Perhaps because these arguments were not in an essay format but were presented as isolated segments, the argument that participants read first served as an expectation for the arguments that would follow. This analysis is consistent with the theorizing and data of Petty, Tormala, Hawkins, and Wegener (2001) who suggest that, for highly motivated individuals, "the break between segments could serve as a signal to stop and consolidate the information just encountered. This consolidation might result in initial attitude formation and an altered interpretation of subsequent information" (pp. 334–335). Therefore, it seems plausible that Kuykendall and Keating's (1990) sad participants

read the initial argument, formed a negative attitude because the topic involved senior comprehensive exams, and therefore had a negative expectation about the segments they were to subsequently encounter.

The aforementioned examples underscore the possibility that previous mood and persuasion studies may have unintentionally provided participants with a negative affective expectation not dissimilar to that used by Wegener et al. (1995, Study 2), thus obtaining similar findings. Moreover, the inclusion of these affective expectations may explain why sad individuals within the mood and persuasion literature, unlike the sad individuals of Lassiter et al.'s (1996) studies and Study 1 who were *not* provided affective expectations for upcoming information, carefully processed both uplifting and depressing information.

As the above discussion illustrates, a negative affective expectation for negative messages may be required to produce effortful thinking by sad individuals. Without this expectation, sad individuals may not effortfully process a negative message and, thus, may not form more favorable attitudes about strong, as compared with weak, messages. However, because sad individuals will likely notice that the information in a positive message is capable of repairing their negative mood, effortful processing of such information is likely regardless of the presentation of a positive affective expectation (as was observed, for example, in Study 1).

It is argued here that the contrasting results between Study 1 (and Lassiter et al., 1996) and the persuasion literature for sad individuals may be due to the exclusion or inclusion of affective expectations for upcoming stimuli. Study 2 directly tests this thesis by replicating Wegener et al.'s (1995) Study 2 with affective expectations and by adding conditions without affective expectations. One explanation for the influence of negative affective expectations might be that sad, relative to happy, participants do not anticipate that the negative message will be as negative as the expectation may have indirectly implied or overtly warned. According to this explanation, sad participants contrast their appraisal of the negative expectation away from their current mood state, thus concluding that effortful processing would not make them feel so bad (cf. Geers & Lassiter, 1999, 2002a, 2002b, 2002c). The purpose of Study 2, then, was to test the forgoing logic that, for sad individuals, the presence or absence of affective expectations may be responsible for the ostensible contradictions between Study 1 and the persuasion literature.

Summary

The purpose of Study 1 was to demonstrate that, unlike neutral-mood individuals who respond identically to differently valenced information, both sad and happy individuals vary the amount of information gained and processed on the basis of the affective qualities of the information. Interestingly, although these results reconcile an apparent discrepancy between Wegener et al. (1995) and

Lassiter et al. (1996), this study also replicated an inconsistency between Lassiter et al. (1996) and the persuasion literature investigating sad moods. As the above discussion points out, one possible reason for this inconsistency may involve the use of affective expectations for upcoming stimuli. Specifically, we argue that, contrary to Schwarz and Clore's (1996) suggestion, sad, but not happy, individuals may be affected by the presence or absence of affective expectations. Because these two mood groups were expected to yield different results under certain conditions and, therefore, serve as comparison groups for each other, neutral-mood conditions were not investigated in Study 2.

STUDY 2

Study 2 is a methodological replication of Wegener et al.'s (1995) Study 2 with the addition of conditions in which no affective expectations were presented. It was predicted that, regardless of the presentation of affective expectations, happy participants would effortfully process uplifting messages to a greater extent than depressing messages. Additionally, consistent with Wegener et al. (1995), it was expected that sad participants who received affective expectations for an upcoming message would effortfully process information regardless of its affective qualities. However, if sad individuals were not presented an affective expectation, they were expected to effortfully process uplifting messages to a greater extent than depressing messages. This study also included both sexes, so that results could be generalized to women as well as men.

Method

Participants

Participating in groups of up to 20 individuals, 346 male and female Ohio University undergraduates participated in this study in exchange for partial course credit. Within each session, participants were randomly assigned to the 2 (mood: happy vs. sad) \times 2 (affective expectation for the message: yes vs. no) \times 2 (hedonic content of the message: uplifting vs. depressing) \times 2 (argument quality: strong vs. weak) between-subjects design.

Procedure

A male experimenter read instructions aloud for the experimental session. Participants were informed that they would be completing two separate experiments for which they would be receiving three separate folders. The first experiment,

participants were told, investigated individuals' imagery ability for written materials. They read a short article contained within Folder 1 and were asked to respond to a questionnaire within Folder 2. Participants were notified that after this "first experiment" was completed, they should close Folder 2 and open Folder 3 to complete the second experiment. It was explained that the second experiment was investigating how students evaluated various university-related issues. From this folder, participants read an essay about a university issue and responded to this essay in an included questionnaire packet. Once they completed all materials, participants were debriefed, given credit, thanked, and dismissed.

Independent Variables

Mood Manipulation. The same happy and sad mood-manipulation articles that were used in Study 1 were presented to participants within Folder 1.

Affective Expectancy. For those participants assigned to the affective expectation conditions, Folder 3 contained a persuasive message with a cover page on which the expectation was provided. These expectations are identical to those used by Wegener et al. (1995, Study 2). For those who would read the uplifting message, the cover page informed participants that the primary quality of the essay they were about to read was that it "makes people feel HAPPY if they think carefully about the information in the article." This same expectation was provided for those who would read the depressing message except that the word HAPPY was replaced by SAD. Additionally, the title of the uplifting persuasive message was "Students Pleased with Tuition Plan that Gives Them a Break," whereas the title for the depressing message was "Students Upset with Tuition Plan that Places New Burdens on Them." Again, these titles were taken directly from Wegener et al. (1995, Study 2). Participants who were assigned to the no-expectation conditions received no cover page on the persuasive message and the title of the essay, regardless of the content of that essay, was "Students Learn of Tuition Plan." It was reasoned that this title was sufficiently ambiguous and should not afford an affective expectation.

Hedonic Content of the Message. The uplifting and depressing persuasive messages used in the present study were the same as those used by Wegener et al. (1995, Study 2). Briefly, within an introductory paragraph, the uplifting message frames a tuition plan as a beneficial opportunity that reduces tuition costs in exchange for optional part-time university service. In contrast, the depressing message frames within an introductory paragraph a tuition plan as a negative burden by requiring all students to work part-time for the university lest they pay out-of-state tuition.

Argument Quality. Participants received a message containing either strong or weak arguments in favor of the university-service program. The same strong and weak arguments were used regardless of whether the message was framed as

being uplifting or depressing. The essays used in the present study were identical to those used by Wegener et al. (1995, Study 2).

Dependent Variables

Manipulation Checks. After participants read either the happy or sad mood-manipulation article, they proceeded to the second folder that contained the same mood-manipulation check used in Study 1 ($\alpha = .96$). Additionally, after participants read the persuasive message in the third folder they indicated on 9-point semantic differential scales, with higher numbers indicating more favorable attitudes, how disagreeable/agreeable, nonenjoyable/enjoyable, and depressing/uplifting they found the message. These items were averaged to create a measure of the hedonic content of the message ($\alpha = .84$). Finally, participants indicated on 9-point semantic differential scales, higher numbers indicating more favorable attitudes, how disagreeable/agreeable, nonenjoyable/enjoyable, and depressing/uplifting they, in retrospect, expected to find the message. These items were averaged to create a measure of the affective expectation for the message ($\alpha = .81$).

Attitudes. On 9-point semantic differential scales, with higher numbers indicating more favorable attitudes, participants rated the university service program discussed in the essay according to how bad/good, foolish/wise, negative/positive, unfavorable/favorable, and harmful/beneficial they determined it to be. These items, which were the same items used by Wegener et al. (1995) to assess attitude, were averaged to create an attitude index ($\alpha = .96$).

Thought Index. After completing the above scales, participants were asked to write down any thoughts, one per line and without worrying about spelling or grammar, that had come to mind while they were reading the essay (a procedure similar to that used by Wegener et al., 1995). After listing their thoughts, participants encountered a page instructing them to go back to their thought listings and indicate whether each thought was positive, neutral, or negative. A research assistant used participants' codings to determine the number of positive, neutral, and negative thoughts generated for each participant. In the rare instances when participants failed to indicate the valence of their thoughts, the coder, who was blind to condition and hypotheses, rated the thoughts as being neutral unless the thoughts were clearly positive or negative. A thought index was computed for each individual by subtracting the number of negative thoughts from the number of positive thoughts and dividing this number by the total number of thoughts (see Cacioppo & Petty, 1981). This measure is commonly used within the persuasion literature as an indication of effortful thinking. In general, if individuals are effortfully processing a message they will generate a higher proportion of positive thoughts while reading a message containing strong, relative to weak, arguments. Furthermore, individuals will tend to form favorable (unfavorable) attitudes about

a message if they generate a high (low) proportion of positive thoughts while reading it.

Results

Manipulation Checks

Mood. The same mood index used in Study 1 was entered into a 2 (mood: happy vs. sad) \times 2 (affective expectation for the message: yes vs. no) \times 2 (hedonic content of the message: uplifting vs. depressing) \times 2 (argument quality: strong vs. weak) between-subjects ANOVA. This analysis revealed a main effect of mood manipulation such that the positive mood manipulation engendered more positive affect ($M = 13.00$) than the sad mood manipulation ($M = 3.39$, $F[1, 329] = 895.111$, $p < .001$, one participant failed to complete the entire mood index).

Hedonic Content. The measure used to index the hedonic content of the persuasive message was entered into the same ANOVA used for the mood index. This ANOVA revealed a significant main effect of hedonic content such that those who read the uplifting message rated it more positively ($M = 5.40$) than those who read the depressing message, $M = 4.10$, $F(1, 330) = 89.401$, $p < .001$. Furthermore, those who read the uplifting message rated it significantly more uplifting than the midpoint and those who read the depressing message rated it significantly more depressing than the midpoint (both $ps < .001$).

Affective Expectation. The measure used to index participants' affective expectation for the message was entered into the same ANOVA used for the above measures. When affective expectations were given, they were congruent with the hedonic content of the message. Thus, a significant Expectation \times Hedonic Content interaction would indicate that only those who received the expectation did in fact expect the message to be positive (for those who would read the uplifting message) or depressing (for those who would read the depressing message). In fact, this anticipated interaction proved significant, $F(1, 330) = 86.60$, $p < .001$. A paired comparison confirmed that those who received no affective expectation did not differ in their expectations for the message, $t(170) = 1.73$, $p = .085$.⁶ However, those who did receive affective expectations expected the uplifting message to be uplifting ($M = 6.51$) but the depressing message to be depressing ($M = 3.49$, $t(172) = 14.15$, $p < .001$).

⁶The expectation measure was completed after participants had already read the message and after many items within the dependent-measure questionnaire had been completed. Therefore, although this comparison approached significance, it is likely due to a kind of hindsight bias wherein participants report, some time after the fact, that they had all along expected the message to be as depressing or uplifting as it actually was.

Main Dependent Measures

Attitude. The attitude index was entered into the same ANOVA used for the previous measures. This analysis revealed a significant main effect of hedonic content such that those who read the uplifting essay formed more favorable attitudes about the essay message ($M = 6.09$) than those who read the depressing essay, $M = 3.98$, $F(1, 330) = 124.31$, $p < .001$. A main effect of argument quality was also obtained such that those who read a message supported by strong arguments formed more favorable attitudes about the essay message ($M = 5.99$) than those who read the message supported by weak arguments, $M = 4.24$, $F(1, 330) = 72.23$, $p < .001$. The ANOVA also revealed a significant Hedonic Content \times Argument Quality interaction indicating that, overall, participants who read the uplifting essay formed more favorable attitudes about the version containing strong arguments ($M = 7.20$) than the version containing weak arguments ($M = 5.03$) to a greater extent than if the essay was depressing ($M_s = 4.52$ and 3.45 for strong and weak versions, respectively, $F[1, 330] = 8.81$, $p < .01$). If happy and sad participants had not been basing their level of processing on the hedonic content of these messages to comparable extents, this interaction would not have occurred. Therefore, that this interaction attained significance suggests that, in general, happy and sad individuals similarly varied the extent to which they processed the messages on the basis of the hedonic content of those messages. However, the expected Mood \times Affective Expectation \times Hedonic Content \times Argument Quality interaction did not reach significance, nor did any other effects for this ANOVA (all $F_s < 3.02$, $p_s > .08$).⁷

Because the four-way interaction was not significant, likely diminished by the overall Hedonic Content \times Argument Quality interaction, the predicted Hedonic Content \times Argument Quality interactions were individually tested for participants in the happy/expectation, happy/no-expectation, and sad/no-expectation conditions. Also, this interaction was tested for those in the sad/expectation condition, although this was not expected to attain significance. For each of these conditions, both the hedonic content and the argument quality main effects had achieved significance (all $F_s > 7.29$ and $p_s < .01$).

The attitude index was independently entered into a 2 (hedonic content of the message: uplifting vs. depressing) \times 2 (argument quality: strong vs. weak) between-subjects ANOVA for happy participants who had, and those who had not, received an affective expectation. Inconsistent with the results of Wegener et al.'s

⁷To test the predicted four-way interaction more precisely, a focused contrast was constructed such that all uplifting message/strong argument conditions were assigned a weight of 1, all uplifting message/weak argument conditions were assigned a weight of -1 , all happy mood/depressing message conditions and sad mood/no expectation/depressing message conditions were assigned a weight of 0, the sad mood/expectation/depressing message/strong argument condition was assigned a weight of 1, and the sad mood/depressing/depressing message/weak argument condition was assigned a weight of -1 . This contrast was significant, $F(1, 330) = 23.23$, $p < .001$.

(1995) Study 2, the Hedonic Content \times Argument Quality interaction was not obtained for happy participants who had received affective expectations ($p = .29$, but see results for the thought index). Importantly, however, the expected Hedonic Content \times Argument Quality interaction was obtained for happy participants who had not received an affective expectation, $F(1, 84) = 6.61$, $p = .012$. This interaction indicates that, for happy participants who had not received an affective expectation, those who read the uplifting essay formed more favorable attitudes about the version containing strong arguments than the version containing weak arguments to a greater extent than if the message was depressing (see Table II for the means on the attitude and thought measures).

The analysis was also performed for sad participants who had received an affective expectation. Consistent with the results of Wegener et al.'s (1995) Study 2, the Hedonic Content \times Argument Quality interaction was not significant for these participants ($F < 1$). Importantly, however, when this analysis was performed for sad participants who had not received an affective expectation, the predicted Hedonic Content \times Argument Quality interaction was found to be marginally significant, $F(1, 80) = 3.38$, $p = .07$. To examine this somewhat weak interaction more precisely, two pairwise comparisons were conducted. It was found that, consistent with prediction, individuals who read the uplifting essay formed more favorable attitudes about the version containing strong arguments than the version containing weak arguments, $t(39) = 3.10$, $p < .01$, whereas no such difference was found for individuals who read the depressing message, $t(41) = 0.63$, $p = .53$.

Thought Index. The thought index was entered into a 2 (mood) \times 2 (affective expectation) \times 2 (hedonic content) \times 2 (argument quality) between-subjects ANOVA. This analysis revealed the same significant effects that were observed for the attitude measure. In particular, a significant main effect of hedonic content was obtained such that individuals who read the uplifting essay generated a higher proportion of positive thoughts about that message ($M = -0.125$) than did those who read the depressing essay ($M = -0.515$, $F[1, 329] = 38.92$, $p < .001$, one participant failed to complete the thought-listing task). A main effect of argument quality was also obtained such that individuals who read a message supported by strong arguments generated a higher proportion of positive thoughts about the essay message ($M = -0.098$) than did those who read the message supported by weak arguments ($M = -0.567$, $F[1, 329] = 47.19$, $p < .001$). The ANOVA also revealed a significant Hedonic Content \times Argument Quality interaction such that, overall, participants who read the uplifting essay generated a higher proportion of positive thoughts about the version containing strong arguments ($M = 0.274$) than the version containing weak arguments ($M = -0.515$) to a greater extent than if the message was depressing ($M_s = -0.466$ and -0.620 , for messages containing strong and weak arguments, respectively, $F[1, 329] = 21.70$, $p < .001$). As was true for the attitude measure, the fact that this interaction attained significance suggests that, in general, happy and sad individuals similarly vary the extent to which they process the messages on the basis of the hedonic content of those messages.

Table II. Means (Standard Deviations) for, and Correlations Between, the Attitude and Thought Measures (Study 2)

	Measure		
	Attitude	Thought	Correlation
<i>Happy Mood</i>			
Expectation			
Uplifting message			
Strong	7.43 (1.41) _a	.355 (.708) _b	.685 [.001]
Weak	5.34 (1.70) _a	-.446 (.653) _b	.698 [.000]
Depressing message			
Strong	4.57 (1.75) _a	-.538 (.533)	.487 [.029]
Weak	3.30 (2.16) _a	-.581 (.664)	.450 [.036]
No expectation			
Uplifting message			
Strong	7.22 (1.35) _a	.480 (.676) _b	-.022 [.921]
Weak	4.79 (1.55) _a	-.544 (.571) _b	.069 [.755]
Depressing message			
Strong	4.57 (1.95)	-.505 (.592)	.731 [.000]
Weak	3.91 (1.54)	-.611 (.567)	.291 [.200]
<i>Sad Mood</i>			
Expectation			
Uplifting message			
Strong	7.34 (1.39) _a	.047 (.795) _b	.486 [.026]
Weak	4.94 (2.02) _a	-.610 (.482) _b	.697 [.000]
Depressing message			
Strong	4.66 (2.25) _a	-.203 (.653) _b	.592 [.004]
Weak	2.73 (1.59) _a	-.720 (.467) _b	.781 [.000]
No expectation			
Uplifting message			
Strong	6.82 (1.81) _a	.211 (.851) _b	.344 [.117]
Weak	5.03 (1.89) _a	-.443 (.668) _b	.541 [.017]
Depressing message			
Strong	4.28 (1.75)	-.626 (.575)	.391 [.072]
Weak	3.94 (1.76)	-.561 (.520)	.648 [.001]

Note. If the strong argument cell differs from the weak argument cell within each Mood \times Expectation \times Message Content condition, the means of the attitude measure (a) or the thought measure (b) will share the same subscript for both cells. These differences were analyzed using the least significant difference post hoc test. The correlation between the attitude and thought measures is presented for each condition, with the two-tailed p value appearing in brackets. The overall correlation between the attitude and thought measure was significant ($r = .614, p < .001$).

However, the expected Mood \times Affective Expectation \times Hedonic Content \times Argument Quality interaction did not reach significance, nor did any other effects for this ANOVA (all $F_s < 2.56, p_s > .11$).⁸

As was the case for the attitude measure, the four-way interaction was likely diminished by the overall Hedonic Content \times Argument Quality interaction.

⁸With the same focused contrast used for the attitude measure, the predicted four-way interaction was tested more precisely. As expected, this contrast was significant, $F(1, 329) = 86.12, p < .001$.

Therefore, the predicted Hedonic Content \times Argument Quality interactions were individually tested for participants in the happy/expectation, happy/no-expectation, and sad/no-expectation conditions. This interaction was also tested for those in the sad/expectation condition, although this was not expected to attain significance. For each of these conditions, both the hedonic content and the argument quality main effects achieved significance (all F s $>$ 4.08 and p s $<$.05) unless otherwise specified.

The thought index was independently entered into a 2 (hedonic content of the message: uplifting vs. depressing) \times 2 (argument quality: strong vs. weak) between-subjects ANOVA for happy participants who had, and those who had not, received an affective expectation. Consistent with the results of Wegener et al.'s (1995) Study 2 and the current predictions, the Hedonic Content \times Argument Quality interactions were significant both for participants who received affective expectations, $F(1, 80) = 7.27, p < .01$, and for participants who did not receive affective expectations, $F(1, 84) = 12.69, p = .001$. These interactions indicate that, among happy participants, those who read the uplifting essay generated a higher proportion of positive thoughts about the version containing strong arguments than the version containing weak arguments to a greater extent than if the message was depressing.

Again, an identical ANOVA was conducted for sad participants who had received an affective expectation. Unlike the ANOVAs conducted for the happy participants, this analysis revealed only a main effect of argument quality, $F(1, 85) = 20.66, p < .001$. Consistent with the results of Wegener et al.'s (1995) Study 2, the Hedonic Content \times Argument Quality interaction was not significant for these participants ($F < 1$). Importantly, however, when this ANOVA was conducted for sad participants who had not received an affective expectation, the predicted Hedonic Content \times Argument Quality interaction was obtained, $F(1, 80) = 6.07, p < .05$. This interaction indicates that for sad individuals who did not receive an affective expectation, those who read the uplifting essay generated a higher proportion of positive thoughts about the version containing strong arguments than the version containing weak arguments to a greater extent than if the message was depressing.

Discussion

The HC hypothesis predicts that happy participants should effortfully process a message to a greater extent if doing so allows them to maintain their present mood. That is, happy participants should think about an uplifting message more and, therefore, form more favorable attitudes about that message if it contains strong arguments as opposed to weak arguments. However, happy participants should not think as carefully about a depressing message and, therefore, the attitudes formed by considering strong arguments should differ less from those formed by considering weak arguments than in the case of an uplifting message.

In Study 2, the happy participants who had received an affective expectation for an upcoming essay generated a higher proportion of positive thoughts about uplifting messages containing strong as opposed to weak arguments to a greater extent than if the message was depressing. These results for the thought index are consistent with previous findings. This pattern was also observed for the attitude measure but was not significant. Participants in the happy/no-expectation condition demonstrated the expected Hedonic Content \times Argument Quality interaction for both the thought index and the attitude measure. In contrast to Schwarz and Clore's (1996) suggestion, this finding demonstrates that an affective expectation is not necessary for happy participants to engage in effortful information processing for uplifting messages. Taken together, these results support the notion that, independent of affective expectations, happy people regulate the extent to which they process information on the basis of the affective qualities of that information.

Replicating both Wegener et al.'s (1995) Study 2 findings and the general findings for sad individuals within the persuasion literature, participants in the sad/expectation conditions demonstrated an argument quality main effect but no Hedonic Content \times Argument Quality interaction for both the attitude measure and the thought index. In other words, as indicated by both the formation of more favorable attitudes and the generation of more positive thoughts in response to strong as compared with weak arguments, sad participants who had received an affective expectation for a message processed the message at a high level regardless of the hedonic qualities of that message.

In contrast, participants in the sad/no-expectation conditions demonstrated results inconsistent with Wegener et al.'s (1995) Study 2 and the persuasion literature involving sad mood. That is, when sad participants were not told that carefully considering the contents of an upcoming message would make them feel happy or sad, these participants effortfully processed uplifting messages to a greater extent than depressing messages, as indicated by the attitude and thought measures.

As mentioned earlier, one potential explanation for the effect of affective expectations on sad individuals' information processing is that sad individuals may contrast their negative affective expectation away from their mood. That is, sad participants who learn that they will be reading a negative message, and that the title of that message mentions a tuition plan, may believe that reading that message will not make them feel very bad compared with the negative state they are currently experiencing. As a result, these participants may be more likely to effortfully process this message. To test the viability of this explanation, we examined individuals' responses to the measure of the affective expectation for the message within the negative-expectation conditions. Of those participants who received a negative affective expectation for a message, those experiencing a sad mood expected the message to be less negative ($M = 3.75$) than did happy participants ($M = 3.21$), $t(85) = 1.77$, $p < .05$, one-tailed. These data provide some support for the proposed contrastive mechanism.

The alternative interpretation of the Study 1 results—that the low unitization rates for happy participants who watched the neutral (mood-depreciating) video might have indicated more efficient, rather than less effortful, processing—cannot account for the findings of Study 2. That is, the happy participants in Study 2 who read the depressing message differentiated less between strong and weak arguments than happy participants who read the uplifting message. It does not seem likely that less differentiation in this instance can be construed as more efficient processing. The failure to fully appreciate the difference between strong and weak arguments we believe is most likely a reflection of a less effortful and thorough evaluation of the message (e.g., Petty & Wegener, 1998).

The disparate results obtained for sad participants, based on whether or not they had received an affective expectation, are important for several reasons. First, these results support the hypothesis of Study 2 that the extent to which sad individuals process depressing information may be moderated by the presence or absence of affective expectations for upcoming stimuli. That is, the results of Study 2 are consistent with the notion that the presence of a negative affective expectation may, at least in some situations, be necessary for sad individuals to extensively process negative information. Second, Study 2 suggests that sad participants do, under some (and perhaps many) conditions, tend to process information in a less effortful fashion. Finally, to the best of our knowledge, Study 2 is the first demonstration of these low levels of processing for sad individuals obtained within a persuasion experiment without discounting the informational value of their mood. That is, prior research that has demonstrated a lack of effortful processing in sad individuals has done so by drawing participants' attention towards a potential cause of their sad mood (e.g., Bohner & Weinerth, 2001).

GENERAL DISCUSSION

Taken together, the results of Studies 1 and 2 are consistent with the notion that both happy and sad individuals vary their level of information processing on the basis of the affective qualities of the information to which they are attending. That is, within two experiments, happy and sad individuals processed information similarly to each other so long as no affective expectations about this information were provided, basing their level of processing on the affective valence of that information. These studies both support the predictions of the HC hypothesis for happy individuals and the NSR model for sad individuals (Cialdini et al., 1973). However, the present studies suggest that the HC hypothesis is not complete with regard to its predictions for sad individuals, nor is the NSR model complete in its predictions for happy individuals. Rather, an integration of these two frameworks, taking into account the moderating role of affective expectations, may prove more predictive than either framework in isolation.

Interestingly, the results obtained in Studies 1 and 2 (for the sad/no-expectation condition) contradict Schwarz's (1990) mood-as-information framework. Schwarz suggests that sad mood indicates that something problematic in the environment requires attention. Thus, sad individuals should effortfully process information lest they risk overlooking important information that may be crucial for their survival or well-being. However, Schwarz suggests that a happy mood indicates that one's environment is benign and, therefore, there is no particular need for actively processing information. Therefore, according to Schwarz and Clore (1996), being in a happy mood does not place processing requirements on the individual, and, thus, happy individuals will tend to process at a lower level unless effortful processing will serve a mood-maintenance function. As the two reported studies clearly indicate, there are not only situations in which sad and happy individuals process information at low levels, but there are also situations in which the processing of happy and sad individuals may evince the same discriminating patterns. Future research should investigate why sad individuals sometimes process information at low levels if in fact doing so might be maladaptive. One tentative explanation is that the information to which sad (and happy) individuals are attending must either be pleasant or important for these individuals to engage in effortful processing. If information is negative, sad individuals appear to require an affective expectation to process effortfully.

The studies reported in this paper dealt with participants' responses to a task of only modest importance in which the experimenter's expectations for information processing were left extremely ambiguous (i.e., participants were told that the experimenter was simply interested in how *they* unitized a given video [Study 1] or how they evaluated a university issue of ambiguous personal relevance [Study 2]). Thus, the present results seem generalizable to situations in which no other goals are operative or likely outweigh mood-maintenance or mood-repair motivations. However, given that many situations involve more intense or urgent motivations, future research should investigate how mood maintenance/repair motivations fare in influencing information gain and processing when other motivations are running in parallel.

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