context, defined as the environment surrounding a stimulus event, is a phenomenon present across all aspects of life (VandenBos, 2006). Context has a direct impact on how we function on a daily basis because memory, learning, judgment, and other cognitive processes are all subject to the effects of context through verbal, written, and visual information (VandenBos). Therefore, the possibility that context effects impact people’s perception of their external environment deserves critical attention. Individuals cannot accurately assess incoming information unless they are aware that context influences their perception and responses. The current study investigates the potential influence of context effects on emotional judgments when people are unaware of contexts, compared to when people are aware of contexts, using the International Affective Picture System database (IAPS; Bradley, Greenwald, Petry, & Lang, 1992). We propose that if context effects influence emotional ratings, then participants’ ratings will differ from the IAPS standardized ratings.

As long ago as 1962, Schachter and Singer hypothesized that emotions are a result of cognitive and physiological states. These investigators manipulated physiological state by injecting participants with either epinephrine or a placebo. Some participants were informed of side effects, other participants were not informed, and others were misinformed. All participants were then placed in a waiting room with a confederate who behaved either in an angry or euphoric manner, in order to create the “context” for the participants’ responses. Results indicated that having information about potential side effects moderated participants’ emotional responses, suggesting that an informed person will be able to make more appropriate responses or decisions than an uninformed person. While these findings underscore the importance of context effects, the methodology has been widely questioned. Manstead (1979) attempted to replicate the Schachter and Singer (1962) study and found conflicting results. Nevertheless, these studies provide support for the importance of context and resulting emotions.

More recently, Dahlén (2005) examined the influence of context effects presented through the media and the resulting influences on consumer choices. Specifically, Dahlén investigated the level of creativity used to present an implicit message. Creative advertisements were defined as having new tactics and presentation styles. Traditional advertisements were defined as using tactics common in advertising. Dahlén hypothesized that as the creativity of an advertisement presentation increases, the more the message will be remembered. In addition, Dahlén also expected that there would be an increase in perceived credibility and in positive responses. To test the hypotheses, Dahlén presented media advertisements both creatively and traditionally. Dahlén also expected that there would be an increase in perceived credibility and in positive responses. Advertisements in both settings were then compared for their effectiveness and influence based on participants’ reactions. The results of this study confirmed that creative ads led the consumers to make positive associations with the target brand, and they were more likely to select that brand. Traditional ads were less likely to lead con-
sumers to make positive associations with or select those brands. These results suggest that the context (creative or traditional) of advertisements may influence the affective state of an individual, raising the question of whether context effects can alter an individual’s affective response to emotional images.

Correspondingly, the contexts in which options are presented appear to influence people’s choices regarding those options. That is, variables such as presenting people with options, the number of options given, the order in which the options are presented, and the context in which the options are given, can be quite influential. A person’s decision can be manipulated by how information is compared and contrasted, such as the price and quality of products. Hamilton (2003) examined the influence of context effects on interactive decision making. An example would be comparing products with trade-offs between the price and level of quality. Hamilton claimed a person’s choices can be altered by providing alternative choices, regardless of whether or not a person actually chooses other options. Participants were presented with two scenarios: one involved making a choice from a restaurant menu and the other involved making a choice between different appliances for a new apartment. Hamilton found that people who were informed that the intention of the study was to persuade them with the use of context effects were more involved and articulate in their decision-making than people who were not informed of this intention. These findings suggest that if participants are informed of potential context effects, they will respond differently than if they are not informed.

Additionally, survey methodologists have noted that the structure and context of questions presented first on a survey will impact people’s responses to the questions that follow (Hair, 2005). Hair identified the involvement of context effects in the production and implementation of survey questions. Statements were presented in two versions in an attempt to provide context for the participants’ responses. One version favored animal rights (pro-version), the other was against animal rights (anti-version). The target question asked participants to indicate the degree to which they agreed or disagreed with the statement: Animals should have the same rights as human beings. The results indicated that participants responded in accordance to the context they received, indicating that context influences an individual’s response to a question. If the participants received the context that favored animal rights (pro-version), then they agreed more with the target statement: Animals should have the same rights as human beings. If the participants received the context that was against animal rights (anti-version), then they disagreed more with the target statement. The results of this experiment raised the question of whether image context will influence participants’ ratings to the images of the whole set.

Celuch, Slama, and Schaffenacker (1997) investigated whether some people are more sensitive than others to situational social cues in advertisements. A situational social cue is a stimulus presented in a social setting that serves to guide behavior. The social cues were deemed either appropriate (consistent with social norms) or inappropriate (inconsistent with social norms). Socially appropriate cues were neutral, such as ads for shampoo or cereals, socially inappropriate cues were for cigarettes or contraceptives. The authors expected that scores based on the Concern for Social Appropriateness Scale (CFA) would measure people’s sensitivity to social context cues and their likelihood of acting on those cues (Celuch et al.). The results indicated that people who scored higher on the CFA were more sensitive to inappropriate social context cues than people who scored lower on the CFA (Celuch et al.). Thus, in response to socially inappropriate cues people who are aware of social context cues respond differently than people who are less aware of context cues. Our intention here is to investigate whether awareness of context allows decision makers to override the influence of context.

Prior to being influenced by context, people process incoming social cues. Valdesolo and DeSteno (2006) noted that the cognitive processes individuals use to process incoming social cues may be influenced by various factors, such as moral judgments, emotions, logic, and the current social stimuli (Valdesolo and DeSteno, 2006). These possible influences are typically in effect simultaneously, agree with one another, and lead the individual to come to one conclusion. However, it is also possible that the influential factors present during cognitive processing disagree with each other, and will lead an individual to different conclusions. When this happens, it can be unclear which conclusion is correct. Valdesolo and DeSteno (2006) hypothesized that positive feelings created by the context of information, at the time a judgment is made, might reduce the perceived negativity (aversion signal) of any possible moral conflict, therefore, increasing utilitarian responses. A utilitarian response is one that is practical and benefits the greatest number of people.

To study this idea, Valdesolo and DeSteno (2006) presented 79 participants scenarios using video clips. One of the clips depicted a positive affect, the other presented a neutral affect. Participants were then asked to report their affective state in response to the presented situation. They found that participants who were presented a positive clip reported a more positive affective state and had a greater chance of selecting the
utilitarian response than those presented with a neutral clip. These findings demonstrate that judgments are not only based on the information being processed, but also on the affective characteristics of the context of that information (Valdesolo and DeSteno, 2006). This suggests that context affects the cognitive processing of emotions and we suggest the processing of emotions can be manipulated by controlling context. Experiment 1 tested the influence context effects have on participants’ responses to emotional images. We proposed that if context effects influence emotional ratings, then ratings will differ by weighted stimulus context. Furthermore, if presented with more negative images, then ratings of positive and neutral images will be more positively rated than the standard rating (the ratings of the images were standardized for valence). If presented with more positive images, then ratings of negative and neutral images will be more negatively rated than the standard rating. Lastly, if presented with an equal number of positive, negative, and neutral images, then the ratings of all of the images will be similar to the standardized ratings.

**Experiment 1**

**Method**

**Participants.** Ninety-six students (76 women and 20 men) from a small western university volunteered to participate. All participants were at least 18 years of age and signed informed consent forms, which informed them of their right to withdraw at anytime. All participants either received course credit or were paid $5 each.

**Materials.** A total of 150 standardized images acquired from the International Affective Picture System (IAPS) database were used in the experiment (Bradley et al., 1992). IAPS is an extensive set of images that have standardized ratings for valence. The ratings ranged from 1 (most negative) to 9 (most positive). For example, a basket of puppies has an average rating of 8, a coffee cup on a table has an average rating of 5, and a shark baring its teeth has an average rating of 2.

In this experiment, context effects were created by the composition of three levels of affective images: positive, negative, and neutral. The images were organized according to their standardized ratings. Based on standardized ratings, images with ratings of 1 to 3 were included in our negative context, images with ratings of 4 to 6 were included in our neutral context, and images with ratings of 7 to 9 were included in our positive context.

There were 90 images per level. Context was created by manipulating the number of positive, negative, and neutral images. The positive context group had 60 positive images, 15 negative images, and 15 neutral images. The negative context group had 60 negative images, 15 positive images, and 15 neutral images. The neutral context group had 30 positive images, 30 negative images, and 30 neutral images. The images were grouped this way because we were interested in the effect the images in the majority had on the images in the minority, and on the ratings of the entire set of images as a whole. For example, for the level of images with 60 positive images, 15 neutral images, and 15 negative images, we were interested in the effect the 60 positive images had on the ratings of both the negative and neutral images, as well as their influence on the average rating of the entire set. We showed each context to 32 participants, totaling 96 participants. We employed varying contexts to provoke positive, neutral, or negative ratings of image content.

**Apparatus.** A 17-inch Dell PC computer presented the stimuli. Participants used the numeric keypad to rate the images. The other keys were inaccessible and inactive during the experiment. DirectRT was the program used to format and present the stimulus (Jarvis, 2006).

**Design.** We examined single independent variable (context group) with three levels by measuring the participants’ ratings of the presented images and their reaction times to make those ratings.

**Procedure.** Participants volunteered for one session. The length of each session was approximately 20 min. Before the experiment began, the volunteer read and signed an informed consent. After the necessary forms were completed, the experimenter instructed the volunteer to sit centered in front of a computer. Instructions were given verbally and also presented on the computer screen. Each participant viewed only one level of context via a computer slideshow. The participant rated each image as positive, neutral, or negative, using the 0–9 Likert scale (0 = negative; 9 = positive). When instructions were complete, the experimenter answered any questions, and then prompted the volunteer to begin a practice session. The experimenter was present during the practice session to ensure the instructions regarding how to rate the images were understood. During the practice session, the volunteer viewed and rated one positive image, one negative image, and one neutral image. At that point, the experimenter answered any further questions and then exited the room. During both the practice session and the primary experiment, the images appeared for 1,000 ms. The Likert scale appeared between the presentations of each image to reiterate the rating scale. The scale remained on the screen until the participant selected a number key to rate the image previously shown. This process of viewing and rating images continued until the participant
had rated all 90 images. At the end of the slideshow, the participant was prompted that she or he had completed the experiment.

After the participant had rated all images, the computer displayed a message that the experiment had been completed. At this time, the participants left the testing room and met with the experimenter for a debriefing and to collect the necessary paperwork, including their copy of the Informed Consent and the campus Bill of Rights (which describes the rights of study participants and is required by our Institutional Review Board).

Results and Discussion
The data was analyzed by MANOVA using the Statistical Software Package for the Social Sciences (SPSS) 15.0 version (Green and Salkind, 2000). This analysis examined participants’ ratings by context group. The results supported all hypotheses. Means and standard errors are presented in Table 1.

Ratings. The main effect of context groups was statistically significant, $F(2, 95) = 46.13, p < .001$. The average rating of all 90 images within the negative-context group was 4.79 ($SE = .037$), meaning the images were evaluated more positively than the standardized ratings when embedded within the greater number of negative images. The average rating of all 90 images within the positive-context group was 4.29 ($SE = .037$), meaning the images were evaluated more negatively than the standardized ratings when embedded within the greater number of positive images. The average rating of all 90 images within the neutral-context group was 4.56 ($SE = .30$), meaning the images were evaluated similarly to the standardized ratings when embedded within the equal number of positive, negative, and neutral images (See Table 1). Thus, the data presented here are the average ratings of each level of images (positive, negative, and neutral) as a whole. The data that follows presents the influence that the images in majority had on the images in minority within each context group.

The interaction between the context group and the standardized ratings was also significant, $F(2, 95) = 8.57, p < .001$. The data reveal that the ratings given by the participants depended on which context they received (see Figure 1). Participants in the negative context group rated positive images (8.89) higher (more positively) than standardized ratings of the same images (7.38). Participants in the positive context group rated negative images (1.1) more negatively than standardized ratings of the same images (1.7) and there was no difference between the neutral context group ratings and the standardized ratings.

### TABLE 1.

<table>
<thead>
<tr>
<th>Context Groups</th>
<th>Negative</th>
<th>Positive</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized Rating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>1.82 (1.79)</td>
<td>1.38 (1.6)</td>
<td>1.78 (1.49)</td>
</tr>
<tr>
<td>Positive</td>
<td>7.63 (1.60)</td>
<td>7.03 (1.46)</td>
<td>7.49 (1.80)</td>
</tr>
<tr>
<td>Neutral</td>
<td>4.90 (0.70)</td>
<td>4.47 (1.41)</td>
<td>4.40 (1.24)</td>
</tr>
</tbody>
</table>

$n = 32$ in each context group.
We also examined our group ratings relative to the standardized ratings of images (see Figure 1). For standardized negative images, ratings averaged between 1 and 3, and our negative context group rated negative images more positively (1.82) relative to the positive context group (1.38), and the neutral context group (1.78). Within the positive context, the negative images were rated more negatively, relative to the negative and neutral context (1.38).

For standardized positive images, ratings averaged between 6 and 8 and our positive context group rated positive images more negatively (7.03), relative to the negative context group (7.63) and the neutral context group (7.49). The positive images within the positive context were rated more negatively, relative to the ratings of positive images within the negative and neutral contexts (7.03).

For standardized neutral images, ratings averaged between 4 and 5, and our neutral context groups rated neutral images more negatively (4.0), relative to the positive context group (4.47) and the negative context group (4.90).

**Reaction time.** Participants responded fastest if they were in the positive context group (1,267.75 ms). Participants in the positive and negative groups responded fastest than the neutral group perhaps because of physical arousal. Within the neutral context group, participants had the slowest reaction time average (1,698.37 ms). Such findings could have been due to the greater number of unbiased images, causing tedium. Within the negative context group, participants had a reaction time average in the middle of the positive and neutral reaction time average times (1,492.05 ms). This could have been because the image content was more engaging, thus altering their reaction time.

Experiment 1 supported our hypothesis that when participants were unaware of our manipulation of contexts, their ratings would be significantly different from standardized ratings. However, to effectively demonstrate that this finding resulted from unawareness of the context, we conducted Experiment 2 to directly test if awareness of context would move participant ratings closer to standardized ratings. We proposed that if participants are aware of context manipulations, then ratings from different contexts would not differ from standardized ratings.

**Experiment 2**

**Method**

**Participants.** One-hundred and twenty students (91 women and 29 men) from a small western university volunteered to participate. All participants were at least 18 years of age and signed informed consent forms, which informed them of their right to withdraw at anytime. All participants either received course credit or were paid $5 each.

**Materials.** All aspects of Experiment 2 remained exactly the same as Experiment 1 with the exception that there were two levels of awareness (unaware and aware). The unaware level provided verbal instructions identical to the verbal instructions used in Experiment 1 and included 60 participants (20 per context group). The aware level verbal instructions informed the other 60 participants (20 per context group) about possible context effects. More specifically, the participants were informed of the context level they were going to view, that the images were grouped intending to change their perception, to be aware of the effects of context, and to not let previous images influence the ratings of future images.

**Design.** We analyzed the hypotheses using a 3 (positive, negative, and neutral context) x 2 (unaware and aware) between-subjects design.

**Results and Discussion**

Using MANOVA on the Statistical Software Package for the Social Sciences (SPSS) 15.0, the data was analyzed. We examined participants’ ratings by context level and awareness level. Means and standard errors are presented in Table 2.

**Ratings.** The main effect of context group was statistically significant, $F(2, 119) = 34.89, p < .001$. The average rating of images within the negative context was 4.81 ($SE = .033$). The average rating of images within the positive context was 4.46 ($SE = .033$). The average rating of images within the neutral context was 4.78 ($SE = .027$). These data show that the images as a whole were evaluated differently depending on the context in which the participants viewed the images.

The main effect of standardized ratings was statistically significant, $F(2, 119) = 8154.82, p < .001$. The average rating of negative images was 2.02 ($SE = .029$). The average rating of positive images was 7.33 ($SE = .029$). The average rating of neutral images 4.70 ($SE = .035$). This data demonstrates that viewing the images within the positive or negative context groups impacted how the participants rated the images, compared to the standardized ratings.

The interaction between context awareness, context group, and standardized ratings was statistically significant, $F(2, 119) = 14.99, p < .001$. To further examine the 3-way interaction we analyzed the data via 2-way interactions by context groups. The 2-way interaction between context awareness and the negative context group was statistically significant $F(2, 119) = 23.84, p < .001$. The interaction between context awareness and the positive context group was statistically significant, $F(2, 119) = 5.53, p < .05$. The interaction...
between context awareness and the neutral context group, however, was not statistically significant, which supports our hypothesis. These data provide evidence that perceptions of images presented within a negative or positive context group are impacted by whether or not the participant is unaware or aware of context (see Table 2).

**Reaction time.** There was a main effect of awareness (Aware vs. Unaware) in the reaction time data, $F(2, 119) = 11.40, p < .001$. Participants in the aware group were faster to respond (1495.90 ms) than participants in the unaware group (1605.03 ms). This could be a result of being more cognitively attentive to the images because the participants were informed to be aware of the effects of context.

Concerning context groups, the reaction time was statistically significant, $F(2, 119) = 3.16, p < .05$. Participants were fastest to respond if they were in the negative context group (1,491.85 ms), suggesting that the adverse images evoked an urgent response. Participants were slowest to respond if they were in the positive context group (1,591.97 ms), signifying that the favorable images did not induce an urgent response. The reaction time for participants in the neutral context group (1,567.58 ms) was between those of the negative and positive context groups. Such findings could indicate that due to the equal number of positive, negative, and neutral images, participants were neither engaged nor repelled by the images, causing no significant effect on their reaction time.

For the standardized image ratings, the reaction time was statistically significant, $F(2, 119) = 25.72, p < .001$. Participants were fastest to respond to neutral images (1,411.84 ms), suggesting that the neutral images held no interest (positive or negative) for the participants. Participants were slowest to respond to negative images (1,699.96 ms), suggesting that participants were engaged by the adverse images. Last, the speed at which participants rated positive images was in-between that of neutral and negative images (1,539.59 ms), implying that the pleasant images were not dull or engaging.

### General Discussion

Context is used by everyone, but particularly by marketing companies to effectively sway consumers to purchase their products. We have demonstrated here that even a person’s emotional judgments can be swayed by context effects, and moreover, that informing a person to be aware of the potential influence of context effects allows that person to be less influenced by the context. These data are noteworthy for consumers and marketers alike, and speak to the importance of extending our understanding of context effects.

Our data from Experiment 1, where none of the participants were informed to be aware of the potential effects of context, suggest that context altered individuals’ perceptions of positive, negative, and neutral images, as hypothesized. We demonstrated that when participants were presented with a context mainly composed of negative images, those participants’ ratings of positive and neutral images were more positive than the standardized ratings for those images. Furthermore, when participants were presented with a context of mostly positive images, then their ratings of negative and neutral images were more negative than the standardized ratings. And in a clear demonstration of manipulating emotional context effects, we found that when participants were presented with an equal number of positive, negative, and neutral images, their ratings of all of the images were similar to the standardized ratings.

Experiment 2 investigated the influence of being aware or unaware of context effects on participants’ image ratings. Again, the results supported our hypothesis. We found that if participants were aware of context...
effects, then their ratings were similar to the standardized ratings. Specifically, participants aware of context effects rated images within the positive and negative context groups no differently than the standardized ratings.

These results indicate that informing people to be aware of the potential of context effects significantly changes their decisions about emotional ratings. This information is important to consumers because being knowledgeable about external influences, such as context, may support informed and rational decisions. We believe that further research regarding awareness of context effects would put consumers at a great advantage. Our data suggest that those who are aware of such implications would benefit because they would be less susceptible to effects of context. Furthermore, consumers would be able to use awareness as a positive cognitive tool when facing purchasing decisions.

Lastly, that context effects and context awareness alter people’s emotional ratings brings to the forefront the idea that emotions can play a significant role in consumer choices. In particular, we have shown that positive, negative, and neutral contexts significantly altered the participants’ emotional responses. Cohen and Pressman (2006) researched the effects of positive affect traits on health. They said that having a positive context of thought could greatly increase both mental and physical health. Their research, along with the current study, undoubtedly demonstrates that context of thought or emotion can significantly influence decision making, including consumer choices. Noticeably, much is known regarding the impact of context on perception, judgments, and consumer choices, but very little research has examined the potential of context effects on emotions. While we know that context effects are present in verbal, written, and visual media, we know of no previous research that considers the potential of context to sway the emotions of intended consumers. Thus, the influence of context effects on emotions, which may manipulate people’s perceptions, decisions, or behaviors, should be thoroughly studied. The relevance of consumer awareness of potential context effects, particularly when emotional processing is required, is an area too long neglected.

References