Psi Chi Journal of Psychological Research

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Psi Chi functions as a federation of chapters located at over 1,100 senior colleges and universities in the U.S., Canada, and Ireland. The Psi Chi Central Office is located in Chattanooga, Tennessee. A Board of Directors, composed of psychology faculty who are Psi Chi members and who are elected by the chapters, guides the affairs of the organization and sets policy with the approval of the chapters.

Psi Chi serves two major goals—one immediate and visibly rewarding to the individual member, the other slower and more difficult to accomplish, but offering greater rewards in the long run. The first of these is the Society’s obligation to provide academic recognition to its inductees by the mere fact of membership. The second goal is the obligation of each of the Society’s local chapters to nurture the spark of that accomplishment by offering a climate congenial to its creative development. For example, the chapters may make active attempts to nourish and stimulate professional growth through programs designed to augment and enhance the regular curriculum and to provide practical experience and fellowship through affiliation with the chapter. In addition, the organization provides programs to help achieve these goals including regional and Society conventions, research award and grant competitions, certificate recognition programs, chapter awards, and Society service projects.

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Submissions are accepted for review on an ongoing basis. Although manuscripts are limited to empirical research, they may cover any topical area in the psychological sciences.

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   - the primary author’s Psi Chi membership ID number;
   - a description of the primary author’s educational status (e.g., an estimated or actual date of graduation, or description of faculty appointment);
   - a statement that the manuscript is original (not published or accepted for publication elsewhere); and
   - a statement that the research was carried out with approval of an institutional review board and following proper procedures for the protection of human participants or animal subjects.

2. Sponsoring statement (undergraduate first authors only) provided by faculty mentor that specifies:
   - the research adhered to APA ethical standards;
   - the mentor has read and critiqued the manuscript on content, method, APA style, grammar, and overall presentation and mentor, affirming that it is high-level, quality work; and
   - the planning, execution, and writing of the manuscript represent primarily the work of the undergraduate student.

3. Cover page:
   - title page in APA style (with manuscript title, authors’ names, institutional affiliations, and possibly an author note).

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   - all authors’ identifying information (e.g., name and school) is removed from the entire manuscript including author note, title page, and method section.
   - the manuscript is in Microsoft Word.
   - the manuscript includes figures, tables, and charts generated in either Microsoft Word or Excel (in black and white or grayscale only).
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*Faculty mentor
As the least studied of the five human senses, olfaction plays an important role in our perception of the world and has extensive, but often unnoticed, influence on our behaviors. Goldstein (2010) summarized the function of the olfactory system, saying that odorant molecules come into the nose and stimulate the receptor neurons in the olfactory mucosa, which send signals to the olfactory bulb. Neurons in the olfactory bulb then transmit signals to the priform cortex and the amygdala, and next to the orbitofrontal cortex.

However, the neurons in the orbitofrontal cortex do not always respond in the same manner to a certain odorant molecule. Other factors such as expectation can alter the perception of odorants and neural processing to create olfactory illusions. Herz and von Clef (2001) first demonstrated that the perception of the hedonics of odorants could be significantly affected by the accompanying odor labels. In some cases, the perception of an odorant was inverted by the labels. For example, a 1:1 combination of isovaleric and butyric acid (rated as having a “cheesy” smell by a separate set of observers) was rated neutral when labeled parmesan cheese and was rated extremely unpleasant when labeled vomit. Morrot, Brochet, and Dubourdieu (2001) found that adding red coloring to white wine led wine tasters to describe the aroma with terms that were usually associated with red wine. Similarly, a test odorant consisting of a mixture of sweat and cheddar cheese was rated more pleasant when it was labeled cheddar cheese than when it was labeled body odor (de Araujo, Rolls, Velazco, Margot, & Cayeux, 2005). Herz (2003) took a further step. She asked participants to evaluate the pleasantness, safety, and familiarity of eight odorants based on the odorants only, or the odor labels only, or both. The results showed that the ratings of odor hedonics

**ABSTRACT.** When odorant molecules enter the nose, they do more than create a sensation of smell. Previous research has documented the influence of odorants on mood, physiology, cognitive functioning, and behaviors. The current study investigated whether and how peppermint, an odor commonly described as alerting, and the expectation of its presence, would affect attention and working memory. Fifty female undergraduate students were randomly assigned to one of three conditions: peppermint (threshold odorant, no expectation), expectation (no odorant, expectation), and control (no odorant, no expectation). Participants completed the Stroop Color-Word Interference Test and memory span assessments while wearing facial masks that either had the odorant applied to them or had no odorant applied in accordance with their condition assignments. We found no significant differences in performance on the Stroop Test and the memory span assessments across all three conditions. We propose that peppermint odorants of higher concentration may be needed to produce enhancing effects on cognitive functioning. The current study contributed to the literature as a pilot study on the topic and posed questions for future researchers.

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**Examining the Effect of Peppermint on Cognitive Functioning**

Sijia Li and Barbara Blatchley
Agnes Scott College

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*Faculty mentor*
were in accordance with the suggestions of the odor labels, whether or not the odorants were present, which demonstrated that verbal context may be more influential than an odorant itself in our olfactory perception. Bulsing and colleagues (2010) observed that an odorant was rated more negatively if it was expected to be irritating. By using electroencephalogram (EEG) to monitor olfactory event-related potentials, they found that the neural processing of the odorant was faster and more intense after participants perceived the odor of H2S with such expectation. The above findings all indicated that olfactory perception is determined by the interaction of the expectation and the chemical properties of the stimulus. Not surprisingly, there has not been an official or generally accepted classification system of odorants in terms of perceived quality and characteristics (Kaeppler & Mueller, 2013).

Researchers have also studied the effect of inhaling odorant stimuli on human behaviors and perception. Rotton (1983) found that participants reported worse moods and a decreased tolerance for frustration in the presence of a malodor. Likewise, in the presence of a pleasant ambient odor, participants reported higher self-efficacy and were more likely to adopt efficient strategies when they were working (Baron, 1990), were more likely to help a stranger in the mall (Baron, 1997), had more pleasurable shopping experience in a mall (Fiore, Yah, & Yoh, 2000), and evaluated the mall environment more positively (Michon, Chebat, & Turley, 2005). Participants also reported improved mood, and lowered anxiety and pain unpleasantness when exposed to painful heat (Villemure, Slotnick, & Bushnell, 2003) and generated narratives of dreams and childhood memory with more positive emotional content (Castellanos, Hudson, Haviland-Jones, & Wilson, 2010).

Some researchers investigated the effect of specific odors on motor behaviors. Raudenbush, Grayhem, Sears, and Wilson (2009) found that participants exposed to peppermint reported higher alertness and lower perceived workload, anxiety, frustration, and fatigue during simulated driving scenarios. Students could perform more push-ups and run faster when exposed to peppermint (Raudenbush et al., 2009). Lavender odor might have powerful effects as well. Sakamoto and colleagues (2012) studied the effect of lavender on preventing fall incidents of elderly adults and found that those who wore a lavender patch fell less often during a 1-year period than those who did not.

Additional evidence has demonstrated that olfactory stimuli could affect cognitive functioning. Bergamot was shown to impair visual vigilance as participants exposed to a bergamot odorant correctly detected fewer targets than those exposed to a peppermint odorant or a nonodorant. Their performance dropped from the first half to the second half of the experiment, which indicated that prolonged exposure to the odorant resulted in larger impairment (Gould & Martin, 2001). Ylang-ylang was associated with impaired memory accuracy and reduced speed of memory (Moss, Hewitt, Moss, & Wesnes, 2008). Martin (1998) observed that EEG theta activity decreased in response to the odor of chocolate in comparison with other odors or nonodor control, which may indicate lower levels of attention. Also using EEG, Diego and coworkers (1998) found that lavender induced drowsiness but led to more accurate and faster math computation of participants. In contrast, rosemary increased alertness and led to faster math computation with no effect on the accuracy. However, in a later study, lavender was linked with impaired working memory and longer response time on memory and attention tasks, and rosemary was shown to enhance the quality of memory though at the cost of speed (Moss, Cook, Wesnes, & Duckett, 2003). The effect of lavender and rosemary odorants on cognition seems inconsistent and needs further research to explain the contradiction.

On the other hand, the research on odors commonly associated with alertness (referred to as alerting odors in the rest of the paper) has produced more consistent results. The presence of the unpleasant hydrogen sulfide led to less interference on the Stroop Color-Word Interference Test and shorter response time to word stimuli in incongruent ink (Finkelmeyer et al., 2010). Peppermint was found to enhance memory accuracy based on the performance of participants on Cognitive Drug Research computerized assessment battery (Moss et al., 2008). The inhaling of peppermint also improved dual-task performance when the difficulty level was high (Ho & Spence, 2005). However, Ilmberger and his colleagues (2001) failed to observe the enhancing effect of peppermint on a simple reaction time task. They found no difference in performance of participants exposed to peppermint, jasmine, menthol, ylang-ylang, and cineole with those in the control group.

Decades of research on the interplay of
olfactory experience and human behaviors and cognition has demonstrated the powerful and far-reaching effects of olfactory stimuli. Herz (2009) conducted a literature review on the observed effects of odor on human mood, physiology, cognitive functioning, and behavior, and assessed the validity of the pharmacological hypothesis and the psychological hypothesis in explaining the mechanisms behind the phenomena. The pharmacological hypothesis claims that certain odorants can affect and interact with the central nervous system and/or the endocrine system, and that they exert their influence through their intrinsic pharmacological properties. However, this theory could not account for the results in studies where incongruent labels were provided for olfactory stimuli and participants’ experience was in accordance with the labels.

In contrast, the psychological hypothesis proposes that odors exercise their influence through the emotions that people have learned to associate with them, which means the power of odors were endowed by the related emotions and not by their chemical structures. The psychological hypothesis possesses more explanatory power as previous research has shown that the perceived quality of the odors rather than the olfactory stimuli determine the effect on human mood and behaviors (Herz, 2009). Yet, further research is needed to create a more detailed picture of the process and to draw a conclusion.

One goal of this study was to find support for the psychological hypothesis. We noticed that few prior studies examined the effect of illusory odors on cognitive functioning. As Herz (2003) found that the ratings of hedonics were consistent with odor labels even when the odor was not present, we decided to explore whether expectation of the presence of an odor would affect cognitive functioning. The other goal of the study was to investigate the effect of the presence of peppermint odorant and the expectation of the presence of an alerting odorant on attention and working memory. We hypothesized that (a) exposure to peppermint odorant (with no expectation) would enhance attention and working memory, and (b) the expectation of experiencing an alerting odorant (with no actual exposure to such odorant) would enhance attention and working memory.

Method
Pilot Study
A pilot study was conducted to determine the detection threshold of the peppermint odor. Three women with a mean age of 20.67 (SD = 0.47) at the College participated in the pilot study. One of them was European American, one Asian, and one African American. Two of them were undergraduate students and one of them was a staff member. These three women were excluded from participating in the subsequent experiment.

The odorant was prepared by diluting the peppermint essential oil (NOW brand) in organic safflower oil (Spectrum Naturals brand). Five different concentrations of the peppermint essential oil were obtained (see Table 1). From each odorant sample, 2.5 ml was put into a 5 ml amber translucent bottle. The bottles were kept sealed except when the odorant was presented to the participants on a trial.

Each of the three participants was tested individually on separate days. They were invited to the laboratory room at 5:00 p.m. When a participant entered the laboratory, she was instructed to read and sign the informed consent and was informed about the general procedures of the study. She was then asked to put on the blindfold and sit at a table across from the researcher. The researcher then presented her with two odorants per trial for a total of 41 trials. On each trial, the peppermint odorant of a particular concentration was paired with pure safflower oil; the participant had to indicate which odorant smelled stronger. Pairs of odorant stimuli were presented in random order. The odorants were presented at the same height as the end of the nose of each participant and about 5 cm away. The researcher presented the odorants of different concentrations in a descending and then an ascending order alternately, starting at a different concentration for each series of trials (see Table 2 for the complete schedule). There was a 10 s gap between each trial and a 30 s gap between each series of trials when the participants smelled the coffee beans. Secundo and Sobel (2006) found that sniffs of coffee between sniffs

### TABLE 1

<table>
<thead>
<tr>
<th>Concentration Label</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
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<tbody>
<tr>
<td>Peppermint Essential Oil (grams)</td>
<td>.056</td>
<td>.028</td>
<td>.028</td>
<td>.028</td>
<td>.028</td>
<td>0</td>
</tr>
<tr>
<td>Safflower Oil (ml)</td>
<td>.25</td>
<td>.25</td>
<td>.50</td>
<td>.75</td>
<td>1.00</td>
<td>2.5</td>
</tr>
<tr>
<td>Concentration (mg per ml)</td>
<td>2.24</td>
<td>1.12</td>
<td>.56</td>
<td>.37</td>
<td>.28</td>
<td>0</td>
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</table>
of fragrances preserved the perceived intensity of the fragrances, although sniffs of clean air reduced the perceived intensity. The participants' responses were recorded as “correct” or “incorrect” on each of the trials.

The detection threshold was defined as the concentration at which the stimulus can be detected 50% of the time. In forced-choice scenarios as in the current study, the detection threshold was established by determining the concentration of the peppermint essential oil at which the participants responded correctly 75% of the time because of a correction rate of 50% would be expected by chance (Goldstein, 2010).

Participants answered the question about the presence of the odorant correctly for Concentration A 86.67% of the time, Concentration B 90.48% of the time, Concentration C 87.50% of the time, Concentration D 91.67% of the time, and Concentration E 85.71% of the time. Because the correction rates on all concentrations were above 75%, we decided to use Concentration E in the experiment as it would be the closest to detection threshold.

The Experiment
Participants. A sample of 50 women participated in the experiment, which examined the effect of peppermint odor on attention and working memory. Their average age was 20.08 years (SD = 2.17 years). All of the participants were undergraduate students. The participants reported to be European American (22%), African American (34%), Asian (28%), Hispanic (4%), biracial (8%), and other (4%). Sixty-four percent of participants indicated that their native language was English and 36% indicated that their native languages were not English.

Participants in this study were recruited via e-mails and postings on social network website (i.e., Facebook®). Students enrolled in introductory psychology courses were encouraged to participate with course credits as an incentive. Students enrolled in other psychology courses were also encouraged, and some of them were offered extra credit. Participation in the study was voluntary. The study was approved by the institutional review board of the author’s college before the recruitment began.

Materials and Measures
The Peppermint Odorant. In the experiment, 100 ml of peppermint odorant of Concentration E was prepared.

The Stroop Color-Word Interference Test. Originally developed by Stroop (1935), the Stroop Test was intended to explain interference and was considered “a hallmark measure of attention” by psychologists (MacLeod, 1991, p. 187). The standard version of the Stroop Test involved naming the colors of color-word stimuli with incompatible ink colors (experimental) and of those in black ink (control). In the original experiment, the stimuli were presented on 10 x 10 stimulus cards, and the response times to the experimental and control card were recorded.

The Stroop Color-Word Interference Test used in this study was a computer program accessible through a CD named “CogLab.” It was an individual stimulus version and was the most commonly used variation from the standard version (MacLeod, 1991). Three colors and three words were presented in the test (red, green, and blue). Word stimuli appeared on the computer screen one at a time, and an examinee was instructed to press a key on the keyboard corresponding to the color of the stimulus. The examinee was immediately informed whether the answer was correct. If the answer was wrong, or the response time exceeded 5 s, the trial was discarded and repeated later in the test. The next stimulus appeared after the examinee pressed the space key. There were 30 word stimuli with incompatible ink colors and 15 word stimuli with compatible colors. The average response times to both types of word stimuli was recorded.

The Memory Span Assessment. The memory span assessment was a computer program accessible through the “CogLab” CD. It evaluated the working memory on five different item categories:

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<td>11</td>
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numbers, letters that sound similar, letters that sound different, short words, and long words. The assessment consisted of a series of trials. On each trial, a list of items appeared on the monitor one by one, each lasting 1 s. After the presentation, examinees clicked on the buttons with items on them in the same sequence as they appeared during the presentation. Examinees were informed whether their responses were correct or incorrect right after they finished answering. If an examinee submitted a correct response, the number of items on the list of the next trial of the same item category grew by one. Otherwise, the number decreased by one. The maximum number of items on a trial was nine. Trials of different item categories were blended together. The assessment took at least 15 min to complete. The computer program then reported the maximum length of items that an examinee had submitted a correct response to on a trial for each item category.

The Participant Survey. The survey (see Appendix) was designed for the current study to gather the demographic information of the participants and their subjective experience of the odorant (or expected odorant) during the experiment. The demographics section requested sex, age, primary occupation, ethnicity, and native language of the participants. The olfactory experience section asked the participants to indicate whether they detected an odorant during the experiment, and if yes, whether the odorant was pleasant or unpleasant, and to circle the adjectives that described the odorant from a provided list.

Procedure
The experiment was run at 5:00 p.m. every day for four consecutive weeks. On each day, only one of the three conditions (peppermint, expectation, and control) was administered in order to prevent contamination of the testing environment and the data. The experiment room was about 160 sq ft with six carrels. Each participant was seated at a carrel to prevent observation of other participants during testing. There was an instruction sheet and a laptop in each carrel. Three packets of absorbent charcoal were placed in the room on the first day of the experiment and remained there for all four weeks of the experiment to remove the odor.

The participants signed up for a date of experiment at their convenience, and a maximum of six participants were allowed to sign up for one day. Participants were told that they could pick any carrel to sit at when they entered the room. The computer programs for assessment were started before the arrival of participants. When all participants who signed up for a specific day arrived, they were given informed consents to read and sign. After collecting the signed informed consents, the researcher introduced the general purpose and procedures of the experiment. Using an eye dropper, the researcher then placed two drops of the odorant (approximately 0.062 grams) onto the convex part of each facial mask and handed the masks to the participants. Participants were instructed to put on the face mask and to keep it on until they were told to take it off. Participants in the expectation condition were told that there was an alerting odorant on their masks. These participants wore masks with two drops of pure safflower oil on them. In the peppermint condition, participants were told that there may or may not be an odorant on their masks. They wore masks with two drops of peppermint odorant of Concentration E on them. And, in the control condition, participants were again told that there might be an odorant on their masks. Control condition masks had two drops of safflower oil on them.

After receiving the masks, participants were instructed to read the instruction sheet and to start the assessment. The researcher determined which of the two assessment tests participants would take first by flipping a coin before the experiment every day. The memory assessment tasks lasted between 20 min to 30 min, depending on the progress of individual participants.

When the participants completed the assessment, they were told to take off their masks and were handed the participant survey. Upon finishing the survey, the participants were given the debriefing sheet and were thanked and dismissed.

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<th>TABLE 3</th>
<th>Participants’ Performance on Stroop Test by Condition</th>
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<td>Condition</td>
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<tr>
<td>Stroopsame (ms)</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Expectation</td>
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<tr>
<td></td>
<td>Peppermint</td>
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<tr>
<td>Stroopdiff (ms)</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Expectation</td>
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<tr>
<td></td>
<td>Peppermint</td>
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<tr>
<td>StroopEffect (ms)</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>Expectation</td>
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<tr>
<td></td>
<td>Peppermint</td>
</tr>
</tbody>
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debriefing sheet, participants in the peppermint and control condition were given more details of the experiment; participants in the expectation condition were informed that there was no odorant on their facial masks and were explained why they were led to believe so initially.

**Results**

Before testing the hypothesis, we checked the effectiveness of the manipulation. Four out of 14 participants in the control condition (no odorant, no expectation) indicated that they sensed an odor during the experiment, 10 out of 20 participants in the expectation condition (no odorant, expectation), and 11 out of 16 in the peppermint condition (odorant, no expectation) indicated the same. However, a chi-squared test revealed that the difference was not significant, though it was trending toward significance, $\chi^2(2) = 4.97, p = .08$.

To examine the hypothesis, we conducted one-way Analysis of Variance (ANOVA) to compare the performance of participants in three conditions on the Stroop Test and the memory span assessment. Table 3 and 4 display the descriptive statistics of participants’ performance by condition and the $F$ statistics for each measure. In this paper, Stroopsame is defined as the average response time for word stimuli with congruent colors, Stroopdiff as the average response time for word stimuli with incongruent colors, and StroopEffect as the differences between the two.

We observed that participants in the expectation condition tended to respond more slowly than those in the peppermint and control condition although their interference indicated by StroopEffect fell between that of the other two conditions. However, none of the results were significant. We then conducted 2 (whether the odorant was perceived) x 3 (condition) ANOVAs to investigate whether the sensory perception of participants and their experimental condition jointly affected their performance. We found no main effect or interaction of these two independent variables on any of the cognitive measures.

In our sample, there were 18 participants whose native language was not English. Ten of them spoke Chinese, four spoke other Asian languages than Chinese, one spoke Kurdish, one spoke Spanish, and two spoke African languages. In the process of analysis, we noticed a tendency for participants who were not English native speakers to perform better on the Stroop Test and to recall more numbers and letters that sound similar in the memory span assessment than did native speakers of English. To evaluate whether and how native language influenced the performance of participants, we conducted 2 (native language) x 3 (condition) ANOVAs for all cognitive measures. The results showed that native language had a main effect on memory span for numbers, $F(1) = 9.13, p = .004$, partial $\eta^2 = .17$, and on memory span for letters that sound similar, $F(1) = 14.64, p < .001$, partial $\eta^2 = .24$. Participants who did not speak English as a native language outperformed those who did on the above two tasks. The interaction between native language and condition was approaching significance for memory span for letters that sound similar, $F(2) = 2.76, p = .07$, and for StroopEffect, $F(2) = 2.30, p = .11$.

**Discussion**

The current study investigated whether and how an alerting odor would enhance cognitive functioning. Specifically, we examined the effect of the presence of peppermint and the expectation of such presence on attention and working memory. Our hypotheses were that (a) exposure to peppermint odorant (with no expectation) would enhance attention and working memory, and (b) the expectation of experiencing an alerting odorant (with no actual exposure to such odorant) would enhance attention and working memory. Neither of the hypotheses was supported. We found no

<table>
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<tr>
<th>TABLE 4</th>
<th>Participants’ Performance on Memory Span Assessment by Condition</th>
</tr>
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<tbody>
<tr>
<td>Condition</td>
<td>$M$</td>
</tr>
<tr>
<td><strong>MS for number</strong></td>
<td></td>
</tr>
<tr>
<td>Control</td>
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<tr>
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<tr>
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<td>4.44</td>
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significant difference in participants’ performance on the Stroop Test and memory span assessment of different item categories among the peppermint, the expectation, and the control condition. However, we did find that participants whose native languages were not English outperformed English native speakers on memory span for numbers and for letters that sound similar, across conditions.

Although the enhancing effect of peppermint odorant on cognitive functioning was not observed in the current study, our results did not necessarily contradict findings of prior research. In the previous studies, the peppermint odorants were above threshold (Ho & Spence, 2005; Ilmberger et al., 2001; Moss et al., 2003; Moss et al, 2008) and there was no confusion regarding the presence of the odorants. In the current study, the concentration of peppermint odor was closer to detection threshold, and participants were not sure about the presence of the odorants. We suspect that the relatively low concentration of the odorant in our study might have contributed to the difference in our results compared to those of other studies. Unfortunately, due to the different methods used to deliver the odorants across studies, no quantitative comparison about the amount of odorants administered to a participant in any study can be made.

Another possibility that may explain the discrepancy is that the participants in the current study were not able to effectively perceive the odorant as alerting. Herz (2009) concluded that it is the perceived quality of an odorant that determines its effect. The concentration of an odorant needs to be four times the threshold concentration for people to recognize its quality (Dalton, 2002). However, only two participants in this study perceived the odorants as alerting. Therefore, participants might have failed to perceive the alerting quality of peppermint because of its low concentration.

The main effect of native language on the memory span for numbers and letters that sound similar is worth noticing. We propose that the phonetic structure of numbers in different languages may cause the difference in performance. For example, there were 10 Chinese native speakers (20% of the participants) in our sample. In Chinese, all numbers under 10 have only one syllable. It is likely that the Chinese participants were using their native language when memorizing the list of numbers, which may decrease the workload as each number would take up less space in the working memory or facilitate rehearsal as repeating numbers became more efficient. Likewise, the category for letters that sound similar was defined based on the pronunciations of letters in English, so their pronunciations might not be similar to each other in a different language. If non-English native speakers saw these letters in their home languages, they would outperform the native speakers because they essentially completed an easier task of letters that sound different.

The effect of native language on the Stroop interference was not significant. We expected to observe less interference with non-English native speakers because they were assumed to process the English color words less automatically than English native speakers (MacLeod, 1991). The participants’ amount of experience with English and their proficiency was not evaluated because it was not the intended focus of the study. Nonetheless, all participants were attending a liberal arts college in the United States and were probably highly proficient with the language. They might have developed similar levels of automaticity of reading English as English native speakers, which could have led to their nondifferential performance on the Stroop interference.

The current study has several implications. This was not the only study where peppermint did not enhance information processing. Ilmberger and colleagues (2001) did not observe an effect on a simple reaction time task with peppermint odorants well above threshold, and they proposed that the strong peppermint odor might be distracting. Because the current study using a relatively low concentration of peppermint did not result in significant enhancement in performance, peppermint may only be an effective enhancer of cognitive functioning under moderate concentrations. Also, we found that participants in the expectation group tended to take longer to respond to Stroop Color-Word Stimuli, although the difference was nonsignificant. We suspect that the expectation of experiencing an alerting odorant may act as a distracter and lead to deteriorated performance. We intended to persuade participants that they were experiencing an alerting odorant with oral instruction. Unfortunately, the manipulation check showed that there were not significantly more participants who reported sensing an odorant in this condition. More elaborate cues than simply verbal labels may be required to produce a realistic experience of the suggested odorants in participants.

The current study added to the literature on the interplay of olfaction and cognitive functioning.
The direction of using expectation instead of actual olfactory stimuli employed in the current study was relatively new and needs more attention. Prior studies have shown that odor labels could alter the perception of the olfactory stimuli (de Araujo et al., 2005; Herz, 2003; Herz & von Clef, 2001; Morrot et al., 2001). Although the expectation of the presence of peppermint did not affect performance in the current study, it was not conclusive. Other manipulation procedures can be used to further explore the role of expectation. Meanwhile, we found a main effect of native language on the performance of two memory span assessments. It pointed to the potential biases of the assessments and called for attention to similar biases in other language-based cognitive assessments.

Limitations to this study are nonetheless worth analyzing. Due to the small size of the college, we were not able to attain a large sample. The small but very heterogeneous sample might have undermined the possibility of finding statistically significant results. Moreover, the memory span assessments we used did not provide good distinction between high and low performers. For example, on the memory span for long words, almost all participants (88%) successfully retained three to five items. This might have prevented finding a meaningful difference in the performance of participants in the different conditions. In addition, 36% of the participants did not speak English as their native language. Some of them might not have fully understood the oral instructions regarding their condition assignments and chose not to ask because it might signify their incompetency with the language. Lastly, most of the Chinese students who participated in the study had a personal relationship with the researcher, which might have affected their perception of the experiment and the level of effort exerted on the assessments. Their uneven representation in each condition (42.86% in the control condition, 10.00% in the expectation condition, and 12.50% in the peppermint condition) might also have led to biased results.

For future work, there are a few directions that researchers may take. They could recruit a large group of participants and apply the same procedures. In the current study, there were many results that were nonsignificant but trending. A large sample often helps clarify the trends. Also, given the fact that the participants in the current study were all women, it would be interesting to see whether men respond differently to the same stimuli and procedures, especially given the documented difference between men and women on the performance of the Stroop Test. Women tend to respond faster to the stimulus than men but there is no evidence on the differential interference between genders (MacLeod, 1991).

On the other hand, researchers may change the method of delivery of peppermint odorants, for example, diffusing peppermint essential oil in the experiment room with a diffuser, attaching a patch saturated with diluted peppermint essential oil to participants’ clothes, or using an olfactometer. The method of delivery in the literature has been very inconsistent, which poses a challenge for researchers to effectively compare different studies. A standardized nonintrusive delivery method needs to be developed in order to facilitate research in this field.

Furthermore, it is necessary to use peppermint odorants of different concentrations, which would possibly reveal whether peppermint odor influences attention and working memory, and whether only peppermint odorants of a certain concentration produce an effect. A condition where participants are exposed to peppermint and receive expectation could also be included. Similarly, different assessments on attention and working memory or assessments on other areas of cognitive functioning could be employed to explore what peppermint odor can affect and what it cannot and the mechanism behind the divergence.

In conclusion, the current study contributed to the understanding of the effect of olfactory stimuli and olfactory expectation on cognitive functioning. We found that threshold concentration of peppermint odor did not affect participants’ performance on attention and memory span assessments; neither did expectation of an alerting odor. Methodologically, the use of expectation is a direction that needs more attention in the research of olfaction. Therefore, this study explored that direction and presented a potential way of inducing expectation.

References
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### APPENDIX

**Participant Survey**

1. Lab ID:
2. Sex: Woman, Man
3. Age:
4. Occupation: a. Undergraduate Student, b. Graduate Student, c. Full-time/Part-time Professor, d. Employees/Staff (General)
6. Your Native Language:
7. Do you smell any odorant during the experiment? a. Yes, b. No
8. If yes, is it a pleasant smell? a. Yes, b. No

If yes, please circle all the adjectives that you think describe the odorant:

- acrid
- alerting
- antiseptic
- bitter
- burning
- choking
- clean
- delicious
- floral
- fragrant
- fresh
- hazardous
- horrid
- irritating
- medicinal
- musty
- natural
- new
- old
- putrid
- pungent
- rancid
- raw
- rich
- rotten
- salty
- smoky
- soothing
- sour
- spicy
- stale
- stinky
- strong
- sweet
- sweaty
- uplifting
- wild
Full-time college students are subject to all the rigors of higher education while they assimilate into a new community. The pressure is overwhelming to many students. More than 50% of cases of attrition in higher education included poor adjustment as at least a partial cause (Kerr, Johnson, Gans, & Krumrine, 2004), contributing to a graduation rate of less than 60% (U.S. Dept. of Education, 2011). In a meta-analytic review, Credé and Niehorster (2012) demonstrated the strength of college adjustment in predicting college retention. They stated that institutional attachment, a core construct of Baker and Syrik’s (1989) model of college adjustment, was the strongest available predictor of retention, accounting for 7.6% of the variance. Researchers have shown that academic adjustment, another component of Baker and Syrik’s model, was associated with grade point average (Hezlett et al., 2001), which in turn was related to attrition (Martinez, Sher, Krull, & Wood, 2009). In addition, poor overall adjustment heightened the risk of alcohol-related negative consequences among college students (LaBrie, Ehret, Hummer, & Prenovost, 2012). College adjustment is comprised of a complex array of thoughts, actions, and feelings that may have antecedents in the developmental history of college students. To this end, we examined perfectionism and residence status as potential social-cognitive predictors of college adjustment.

College Adjustment
Baker and Syrik (1989) defined college adjustment as wellness in relation to a student’s academic, social, and emotional stability, as well as institutional attachment. Their model is a composition of four dimensions as follows. Academic adjustment addresses the degree to which a student has adapted to the academic demands that college
Researchers have identified several individual and group differences that predicted adjustment to college. Self-efficacy (Ramos-Sánchez & Nichols, 2007) and prior academic achievement (Coyle & Pillow, 2008) predicted overall college adjustment and academic adjustment, respectively, demonstrating a link between cognitive expectation, past experience, and wellness. In a recent meta-analysis, Credé and Niehorster (2012) found that, of the big five personality traits, emotional stability, agreeableness, openness to experience, and extraversion predicted social adjustment, and conscientiousness predicted academic adjustment. These results established a link between personality and college adjustment, and indicated that aspects of college adjustment are differentially predicted. Regarding group differences, they revealed that minority status (i.e., ethnicity, sex, disability, immigration status, socioeconomic status, age, and first-generation college student status) tended to negatively predict overall college adjustment. Importantly, however, this effect was moderated by perceived social support from friends on campus (Hertel, 2002), where greater social support predicted better adjustment. For the present study, we suggested that perfectionism and residence status may account for some of the relationships described above because they speak to both individual and situational dimensions that could influence college adjustment.

Likewise, researchers have identified some experiential factors that affect college adjustment. Subjective experiences such as loneliness and depression hindered college adjustment because, among other reasons, they limited social engagement (Kim, Rapee, Oh, & Moon, 2008). In the same way, general negative experiences such as rejection were associated with poor college adjustment (Rice, Vergara, & Aldea, 2006). Such experiences by themselves, however, may not determine college adjustment. Supporting the preceding perspective, researchers have found that effective coping strategies for negative experiences predicted healthy college adjustment (Galatzer-Levy, Burton, & Bonanno, 2012). Others have found that healthy parent-child relationships (i.e., authoritative parenting) predicted healthy adjustment to college (Hickman & Andrews, 2003). Thus, it may be concluded that the acceptance experienced with authoritative parenting helped students to anticipate acceptance in a new setting. We studied perfectionism because it is likely developed through such early social experiences in the family and may influence adjustment in college.

Perfectionism

Individuals maintain standards of performance to which they hold themselves. When a person’s standards are excessively high, they exhibit perfectionist beliefs (Flett & Hewitt, 2002). Once thought to be monolithic (Hollender, 1965), there is now consensus that there are two categories of perfectionism (Rice, Ashby, & Gilman, 2011). Hamachek (1978) was one of the first to propose a differentiation between normal and neurotic perfectionism. This was later refined as a distinction between perfectionistic strivings and perfectionistic concerns (Stoeber & Otto, 2006). That is, there are positive (striving) aspects of perfectionist beliefs such as a strong work ethic and high standards as well as negative (concerns) aspects such as excessive self-criticism and lack of fulfillment. Thus, researchers identified the broad categories of adaptive and maladaptive perfectionism, which subsumed the positive and negative aspects of perfectionism, respectively. Researchers have since expanded each category of perfectionism, further developing aspects such as need for organization, high standards, and concern over mistakes (Frost, Marten, Lahart, & Rosenblate, 1990).

Research has shown that adaptive perfectionism was associated with better social connectedness and higher academic adjustment in college, and the opposite associations were found with maladaptive perfectionism (Pritchard, Wilson, & Yamnit, 2007; Rice, Leever, Christopher, & Porter, 2006; Rice, Vergara et al., 2006). Researchers have not examined the relationships between either adaptive perfectionism or maladaptive perfectionism and the other types of college adjustment (personal-emotional adjustment and institutional attachment). Building on previous research, the present study utilized four aspects of the conceptualization of perfectionism devised by Stairs, Smith, Zapolski, Combs, and Settles (2012) in predicting Baker and Syrik’s (1989) four types of college adjustment. In particular, we examined one aspect of adaptive perfectionism, high standards, and three aspects of maladaptive perfectionism,
Predictors of College Adjustment | Lapoint and Soysa

dissatisfaction, reactivity to mistakes, and black and white thinking.

Residence Status
There has been limited literature on the relationship between residency (resident/commuter status) and college adjustment, which is an important dimension, given the prominence of commuters in public universities like ours. In the existing literature, most researchers have addressed the relationship between residence status and potential correlates of college adjustment. For example, Mohammadi, Schützer, and Nunnery (2010) reported that resident students showed greater vocational commitment, persistence, and academic achievement than did commuters. Astin (1999) stated that commuters experienced less interaction with peers and faculty, and reported lower levels of social fulfillment, support, and opinion of the institution. Social fulfillment may be conceptualized similarly to social adjustment, as opinion of the institution is to institutional attachment, based on the definitions of Baker and Syriki (1989). It may be surmised that on-campus residency represents a greater immersion in the college community and may be beneficial to college adjustment. Residency appears to offer more opportunities to learn vicariously and develop encouraging relationships with peers, which may predict college adjustment.

Theoretical Perspective: Social Cognitive Theory
Bandura (1986) developed social cognitive theory to examine socially-informed human development. He proposed a triadic relationship between cognitive events, behavior, and the environment. The relationship is dynamic so that one’s beliefs, for instance, at once influence and are influenced by environmental context and behavior. Through such a process, the cultural environment shapes our cognitions and behaviors, contributing to personality. In this reciprocal dynamic, Bandura stated that personality could impact decision-making (cognition), behavior, and the seeking of a preferred environment (Bandura, 1986). Researchers have argued that perfectionism constitutes a personality construct that is permanent, pervasive, and unique from other personality traits (Auyeast, Flett, & Hewitt, 2012).

In his theory, Bandura (1989) placed strong emphasis on self-efficacy, which is the degree to which a person believes in the power of his or her own actions. He described self-efficacy as a product of behavioral consequences and the environment. Self-efficacy is conceptually related to perfectionism, which is defined as the relative harshness of the standards to which people may hold themselves (Stoeber & Otto, 2006). That is, self-efficacy addresses subjective beliefs about the ability to produce, and perfectionism is about the perceived quality of the product. Those in the normative range of perfectionism have more lenient standards for themselves, having a realistic sense of how much effort is sufficient to attain goals.

Bandura (1986) highlighted the actions of others as influences on personality. He suggested that our understanding of behavioral consequences is largely a result of vicarious learning, by which we witness the actions of others and the consequences that they bear. Alternatively, verbal encouragement helps the individual to foresee positive consequences and engage in the behavior that will attain them. These ideas are especially salient in a close-knit, yet novel, college environment. For example, if students build strong social relationships, they are likely to garner more verbal encouragement and have more opportunities to learn vicariously, thus aiding adjustment. Because level of immersion is likely to affect the amount of peer exposure that a student experiences, we expected that residence status would predict college adjustment.

In the triadic determinism espoused by Bandura (1986), perfectionism constitutes the cognitive dimension based on its self-evaluative component. The college environment is the context in which these cognitions and particular behaviors occur, and residence status is an indicator of immersion in that environment. College adjustment is the behavioral dimension, reflecting behavioral reaction to the environmental transition. Because the relationship is dynamic and reciprocal, the college environment may influence students’ beliefs and actions. Introduction to the college environment may, therefore, affect perfectionism, consequently shaping the degree of college adjustment.

The present study examined four of Stairs et al.’s (2012) conceptualizations of adaptive and maladaptive perfectionism and residence status as predictors of Baker and Syriki’s (1989) four types of college adjustment from a social cognitive approach. Researchers have not previously investigated perfectionism and residence status together in predicting college adjustment.

We hypothesized that aspects of perfectionism (high standards positively, and dissatisfaction, reactivity to mistakes, and black and white thinking...
Inversely) would predict academic adjustment, social adjustment, personal-emotional adjustment, and institutional attachment.

In addition, it was expected that residential status would add unique variance in predicting academic adjustment, social adjustment, personal-emotional adjustment, and institutional attachment when examined together with aspects of perfectionism.

**Method**

**Participants**
Participants were 175 first-year students from a small, public university in the northeastern United States. All participants were full-time students (minimum of 12 credits per semester) and at least age 18. Only 37.7% of students gave their exact age on the demographic questionnaire. Of these, the mean age was 18.77 (SD = 0.53). Most participants were women (71%). Regarding race, our participants were White (83.4%), Black (2.3%), Latino (5.1%), Asian (2.9%), Native American (1.7%), and of biracial background (4.6%). Participants lived primarily on campus with one or more roommates (61.7%), on campus without a roommate (4%), or at home with parents (34.3%).

We recruited participants utilizing two methods. First, students in the first-year seminar responded to the protocol in their classes (69.7%). These students were required to participate in either the study or an alternate activity, which we provided. In the alternate activity, students were required to read through the protocol and answer questions regarding possible relationships between measures. None of the students selected the alternate option. Second, students in general psychology partially fulfilled their psychology subject pool research requirement by participating in this study (30.3%). These recruitment procedures encouraged students of many majors to participate, rather than just psychology students. Regardless of method, we collected all participant data in mid-October. We selected this time frame in order to minimize the effects of both the initial shock of transition as well as end-of-semester stress.

Participant data that did not fit the initial inclusion criteria (minimum age 18, full-time credit load) were discarded (n = 15). From the remaining participant data (N = 201), we narrowed our sample to include only first-year students in keeping with our aim to examine the transition to college of students living either in residence halls or at home with parents, thereby excluding those living in off-campus apartments. Participant data that did not meet these criteria were not used in data analyses (n = 26), leading to our final sample of N = 175. Some analyses had a lower n due to missing data.

**Measures**

**Demographic questionnaire.** We created a questionnaire specifically for this study in order to obtain general information. Participants were asked to report their residence status, as well as sex, age, race/ethnicity, class standing, and current credit enrollment. The questions about age and credit enrollment were used to cross-check participant recruitment criteria as described above.

**Student Adaptation to College Questionnaire (SACQ).** This is a 67-item instrument with a 9-point Likert-style response scale where 9 indicates the answer applies very closely to me, and 1 indicates the answer doesn’t apply to me at all (Baker & Siryk, 1989). All points between represent relative agreement or disagreement with the statement. The measure consists of four subscales: Academic Adjustment (24 items), Social Adjustment (20 items), Personal-Emotional Adjustment (15 items), and Institutional Attachment (15 items). Thirty-seven items are reverse-scored. Two items do not fit into any subscale and contribute only to the total College Adjustment Score. In addition, nine items are included in two separate subscales. We excluded three of these items (all of which contributed to Social Adjustment; one of which also contributed to Institutional Attachment) because they applied only to the adjustment of resident students, excluding the commuters in our sample. Baker and Siryk (1999) reported Cronbach’s alphas in the subscales ranging from .77 to .91. For our sample, subscale Cronbach’s alphas ranged from .85 to .91 (See Table 1 for descriptive data).

**Measures of Constructs Underlying Perfectionism (M-CUP).** This instrument was based on 15 popular perfectionism measures (Stairs et al., 2012). The authors designed nine subscales to subsume all aspects of perfectionism examined by those measures. The M-CUP is a 61-item instrument with a 5-point Likert-style response scale ranging between 1 (strongly disagree) and 5 (strongly agree). We utilized four of the nine subscales including high standards (measuring adaptive perfectionism) and dissatisfaction, black and white thinking, and reactivity to mistakes (measuring maladaptive perfectionism). These four subscales were most pertinent to our subject matter. Stairs et al.
of Constructs Underlying Perfectionism, and the Student Adaptation to College Questionnaire. Because we did not want to prime participants by revealing the focus of the study, college adjustment was consistently examined last instead of counter-balancing the two measures. Following completion of either the protocol or the alternate activity, we offered participants a chance to enter a raffle for an incentive prize of a $20 gift card and handed out an information sheet containing researcher contact information and a brief description of the study. Further, we gave a credit slip to those who participated as part of the psychology subject pool.

**Results**

A correlation matrix (Table 1) displayed the interrelationships between the aspects of perfectionism and types of college adjustment as well as mean and standard deviation for each variable. The data showed that adaptive perfectionism (high standards) was not significantly correlated with maladaptive perfectionism (dissatisfaction, black and white thinking, and reactivity to mistakes). On the other hand, the three aspects of maladaptive perfectionism were highly intercorrelated.

Regarding the first hypothesis, as indicated in Tables 2 through 5, at least one aspect of perfectionism (adaptive: high standards; maladaptive: dissatisfaction, black and white thinking, and reactivity to mistakes) predicted all four types of college adjustment. Specifically, high standards (positively) and dissatisfaction (inversely) predicted academic adjustment and institutional attachment. Dissatisfaction (inversely) predicted social adjustment. Dissatisfaction (inversely), reactivity to mistakes (inversely), and black and white thinking (positively) predicted personal-emotional adjustment. Aspects of perfectionism contributed significant variance in predicting academic adjustment, $R^2 = .41$, $p < .001$, Cohen’s $f^2 = .69$, social adjustment,
$R^2 = .23, p < .001$, Cohen’s $f^2 = .31$, personal-emotional adjustment, $R^2 = .45, p < .001$, Cohen’s $f^2 = .82$, and institutional attachment, $R^2 = .23, p < .001$, Cohen’s $f^2 = .30$, supporting the first hypothesis.

Testing the second hypothesis, in the second step of each hierarchical regression analysis, we added residence status as a predictor of college adjustment (see Tables 2–5). In this way, we examined whether residence status contributed unique variance in predicting college adjustment when examined together with the four aspects of perfectionism. Perfectionism and on-campus residency together positively predicted social adjustment, $R^2 = .32, p < .001$, Cohen’s $f^2 = .46$, post-hoc observed power = 1.00, and institutional attachment, $R^2 = .25, p < .001$, Cohen’s $f^2 = .34$, post-hoc observed power = 1.00, but only perfectionism predicted academic adjustment, $R^2 = .42, p < .001$, Cohen’s $f^2 = .72$, post-hoc observed power = 1.00, and personal-emotional adjustment, $R^2 = .45, p < .001$, Cohen’s $f^2 = .82$, post-hoc observed power = 1.00, partially supporting the second hypothesis. Residence status added significant unique variance for social adjustment (8%) and institutional attachment (2.5%). Effect sizes for the changes in variance were Cohen’s $f^2 = .12$ (medium) and .03 (small), respectively.

**Discussion**

Researchers have established aspects of perfectionism (Pritchard et al., 2007; Rice, Leever et al., 2006; Rice, Vegara et al., 2006) and residence status (Astin, 1999; Mohammadi et al., 2010) as predictors of some types of college adjustment. We studied aspects of perfectionism as predictors of four types of college adjustment. We then examined whether residence status added additional unique variance in predicting college adjustment.

Adding to the previous literature, at least one aspect of perfectionism predicted all four types of college adjustment as expected. Residence status added unique variance in predicting both social adjustment and institutional attachment in keeping with the findings of Astin (1999), who found an association between residency and analogues of these types of adjustment. Our results were consistent with our theoretical underpinnings and hypotheses. Bandura (1986) posited that belief

<table>
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<th>TABLE 2</th>
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<td>Residence Status</td>
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</table>

Outcome–Academic Adjustment

Note: $R^2$ = Proportion of outcome variable variance explained by predictors. ***$p < .001$, Cohen’s $f^2$ = effect size. Step 1 $R^2 = .23, F(4, 151) = 26.24, p < .001$, Cohen’s $f^2 = .31$. Step 2 $R^2 = .32, F(5, 149) = 21.43, p < .001$, Cohen’s $f^2 = .46$ (medium range effect size).

<table>
<thead>
<tr>
<th>TABLE 3</th>
<th>Hierarchical Regression With Perfectionism and Residence Status as Predictors of Social Adjustment</th>
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</table>

Outcome–Social Adjustment

Note: $R^2$ = Proportion of outcome variable variance explained by predictors. ***$p < .001$, Cohen’s $f^2$ = effect size. Step 1 $R^2 = .23, F(4, 151) = 11.48, p < .001$, Cohen’s $f^2 = .32$ (medium range effect size). Step 2 $R^2 = .32, F(5, 149) = 13.82, p < .001$, Cohen’s $f^2 = .46$, post-hoc observed power = 1.00, with five predictors, $p = .05$ and $N = 155$.  

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in the power of one’s own actions is conducive to proactive interaction with one’s environment, and that this triad of cognitions, behaviors, and the environment reciprocally inform each other. Based on our results, this model applied to first-year undergraduates in their transition to the novel environment of the college campus.

Regarding perfectionism, supporting the first hypothesis, high standards (adaptive perfectionism) positively and dissatisfaction (maladaptive perfectionism) inversely predicted both academic adjustment and institutional attachment, accounting for 41% and 23% of the variance respectively (see Tables 2 and 5). The effect sizes for these predictions were high for academic adjustment, $f^2 = .69$, and in the medium-high range for institutional attachment, $f^2 = .30$. Dissatisfaction inversely predicted social adjustment, accounting for 23% of the variance (see Table 3). The effect size for this prediction, $f^2 = .31$, was in the medium-high range. Finally, dissatisfaction (inversely), black and white thinking (positively), and reactivity to mistakes (inversely) all predicted personal-emotional adjustment, accounting for 45% of the variance (see Table 4). The effect size for this prediction was extremely high, $f^2 = .82$, indicating that aspects of maladaptive perfectionism were most effective at predicting this particular type of college adjustment.

Our results were consistent with the findings of Rice, Leever et al. (2006), who found that adaptive perfectionism was conducive to academic adjustment, and maladaptive perfectionism debilitated social connectedness. Further, lending support to our social-cognitive perspective of the reciprocal relationships between cognitions, behavior, and the environment (Bandura, 1986), perfectionist attitudes and beliefs represented socially informed cognitions that predicted adjustment to the college environment.

Supporting the second hypothesis, residence status added unique variance when examined together with aspects of perfectionism in predicting some types of college adjustment. That is, residency added 8% unique variance in predicting social adjustment and 2.5% for institutional attachment (see Tables 3 and 5). These two outcomes were most consistent with the expected effects of residency, based on the work of Astin (1999). Resident students spend significant time within a community of people similar to themselves, offering a camaraderie not experienced by commuter students. These forms of adjustment are, further, the most pertinent in predicting long-term retention. Credé and Niehorster (2012) found that institutional attachment was the best predictor of retention, and social adjustment was the second-best predictor.

Few studies have addressed residence status in relation to college adjustment, thereby excluding examination of the college experience of commuter students. Our study improved the literature in this regard. Resident students have greater possibility for immersion in the life of the institution. They experience more opportunities to learn vicariously and garner encouragement from peers, faculty, and staff, key components of Bandura’s (1986) social cognitive interpretation for the development of belief in the power of one’s own actions. This appears to be especially salient for social adjustment, consistent with the findings of Astin (1999). This makes sense, considering the amount of time spent with peers that sharing a living space provides. The counterpoint is that commuter students lack these social-learning opportunities, thereby placing them at greater risk for poor social adjustment and institutional attachment, which in turn, are the best predictors of college retention.

In contrast to our hypotheses, black and white thinking, an aspect of maladaptive perfectionism, positively predicted personal-emotional adjustment. This finding was especially intriguing because the associations between black and white thinking and all four types of college adjustment were negative and significant (see Table 1). It appears that black and white thinking positively predicted personal-emotional adjustment in conjunction with dissatisfaction and reactivity to mistakes inversely predicting this outcome, demonstrating the value of examining them together. Black and white thinking may have produced unexpected results because there is still so much unknown about the construct. Stairs et al. (2012) developed the construct of black and white thinking to assess a person’s propensity for perfectionist false dichotomies that reflect maladaptive perfectionism. For example, one statement read “If I cannot do something perfectly, I might as well not do it at all.” However, we may consider this to be a call to action or an expression of confidence to reflect adaptive perfectionism. Indeed, it runs parallel to the proverb “Anything worth doing is worth doing well,” though it differs in severity of the terms well as opposed to perfectly. This construct is further obscured by structural problems. The subscale consists of only four questions, the smallest
number of questions of any subscale in Stairs et al.’s (2012) M-CUP. The assessment of black and white thinking is also unique to the M-CUP. In the 15 measures that the authors examined, such a conceptualization did not explicitly exist. It was an aspect of perfectionism of the authors’ own conception, derived from several items on previous assessments of dichotomous thinking. The present study could be considered a preliminary test of this new aspect of perfectionism, and future studies could shed further light on whether it accurately reflects maladaptive or adaptive perfectionism, or whether its impact is contextual.

**Limitations**
In conforming to the needs and availability of our sample, our participants responded to all of the self-report questionnaires in one session. If the option was feasible, we might have otherwise utilized a two-phase design. That is, we would have examined incoming students’ residence status and perfectionism at the beginning of their first semester, and assessed their adjustment to college months later. A longitudinal design might have yielded more accurate data about the role that residence status and perfectionism play in a new student’s transition to college.

Our participant sample was not ideal in terms of demographics. Despite our best efforts, only 29% of the study sample was comprised of men, reflecting the compositions of the classes from which we drew participants. Furthermore, our participants were predominantly White (83.4%), significantly higher than in the American population (77.9%), and included fewer other ethnic groups (e.g., Black: 2.3% compared to 13.1% nationally). It is important to note, however, that the sample more adequately reflected the population of the area surrounding the university (e.g., 88.4% White, 5% Black; U.S. Dept. of Commerce, 2013). A large sample size likely would have yielded a more representative group and more reliably established outcomes.

We did not counterbalance the perfectionism and college adjustment measures in our protocol. The rationale was that we did not want to prime respondents to the primary object of study, college adjustment. Further, this questionnaire was placed last in order to minimize respondent fatigue, because it was significantly longer than others used in the study (67 items as opposed to 26 in the measure of perfectionism). As a result, order effects might have played a role in the results.

**Future Directions**
In light of our results, it appears that dimensions of perfectionism are the most pertinent to potential applications of the present study. Future researchers could examine the effectiveness of curbing maladaptive perfectionist ideation. Although perfectionism is a personality trait (Ayestar et al., 2012) and is therefore resistant to change, there are promising options for coping with maladaptive perfectionism. Chang (2012) demonstrated the effectiveness of curtailing maladaptive perfectionist beliefs using emotion-focused coping strategies, and Gnilka, Ashby, and Noble (2012) found that coping methods can reduce anxiety related to maladaptive perfectionism. Argus and Thompson (2008) found that mindfulness-based interventions had the potential to moderate the negative impact of maladaptive perfectionism on depression. Given our findings regarding the negative impact of maladaptive perfectionism and the positive impact of adaptive perfectionism, psychoeducation on appropriate interventions is one avenue for aiding the college transition. Although the literature on managing perfectionist concerns is promising, there has

### TABLE 4

<table>
<thead>
<tr>
<th>Predictors</th>
<th>β</th>
<th>95% CI</th>
<th>M</th>
<th>SD</th>
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<tr>
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<tr>
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<td></td>
<td></td>
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<td>Reactivity to Mistakes</td>
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<td></td>
</tr>
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<td>High Standards</td>
<td>.05</td>
<td>[-0.30, 0.61]</td>
<td>23.47</td>
<td>5.72</td>
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<tr>
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<td>[0.01, 0.33]</td>
<td>24.15</td>
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<td>Reactivity to Mistakes</td>
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<td>[-1.49, -0.23]</td>
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Note: $R^2$ = Proportion of outcome variable variance explained by predictors; $p < .05$, $^*$ $p < .01$, $^{**}$ $p < .001$. Cohen’s $f^2 = \text{effect size. Step 1 } R^2 = .45, F(6, 153) = 31.50, p < .001$. Cohen’s $f^2 = .82$. Step 1 to Step 2 $R^2 = .45, F(6, 152) = 31.50, p < .001$. Cohen’s $f^2 = .82$; post-hoc observed power = 1.00, with five predictors, $p = .05$ and $N = 158$. 

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Lapoint and Soysa | Predictors of College Adjustment

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yet to be research on the influences of such processes on college adjustment. We recommend that researchers investigate how these intervention strategies could improve the college experience of incoming students.

Research on commuter experiences is sparse. The majority of students at the university at which this study was conducted are commuters (69%), yet the majority of our participants were residents (65.7%), highlighting the efforts of the university at retaining students from the first to second year when attrition is at its peak. Institutions with majority commuter populations need to develop alternate means of creating institutional attachment, which is currently the single best predictor of college adjustment (Credé & Niehorster, 2012). Perhaps creating cocurricular opportunities that combine classroom instruction with high levels of peer interaction and institutional identity merit investigation. Furthermore, college adjustment could be investigated in multi-institutional studies with varying degrees of commuter representation.

Further, there is more research needed on predicting college adjustment. Perfectionism and residence status constituted different components of the triadic model (cognitive events and social environment, respectively). Each has bearing on the behavioral component of college adjustment. We expanded the literature by identifying aspects of perfectionism and residence status as differential predictors of the types of college adjustment. College adjustment is an important construct because it is a predictor of negative alcohol consequences (LaBrie et al., 2012), and each type of adjustment is indicative of a student’s well-being in a particular area. Institutional attachment is especially pertinent to examine because it was the foremost predictor of college attrition (Credé & Niehorster, 2012), yet was inadequately researched. Based on our results, we suggest identification of and intervention for maladaptive perfectionism, as well as an emphasis on resident housing as a means of increasing college adjustment and perhaps decreasing attrition, a prevalent concern of undergraduates and the institutions that serve them.

### Conclusion
Perfectionism and residence status both contribute unique variance in predicting college adjustment. Our findings were consistent with social cognitive theory in the following ways. Perfectionism and residence status constituted different components of the triadic model (cognitive events and social environment, respectively). Each has bearing on the behavioral component of college adjustment. We expanded the literature by identifying aspects of perfectionism and residence status as differential predictors of the types of college adjustment. College adjustment is an important construct because it is a predictor of negative alcohol consequences (LaBrie et al., 2012), and each type of adjustment is indicative of a student’s well-being in a particular area. Institutional attachment is especially pertinent to examine because it was the foremost predictor of college attrition (Credé & Niehorster, 2012), yet was inadequately researched. Based on our results, we suggest identification of and intervention for maladaptive perfectionism, as well as an emphasis on resident housing as a means of increasing college adjustment and perhaps decreasing attrition, a prevalent concern of undergraduates and the institutions that serve them.

### Predictors of College Adjustment: Perfectionism and Residence Status

The following table presents the hierarchical regression analysis for perfectionism and residence status as predictors of college adjustment.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>(N = 157)</th>
<th>(\beta)</th>
<th>95% CI</th>
<th>(M)</th>
<th>(SD)</th>
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<td>[.01, .11]</td>
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<td>5.76</td>
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<td>[.00, .04]</td>
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<td>3.34</td>
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<tr>
<td>Reactivity to Mistakes</td>
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<td>[-.07, .01]</td>
<td>18.23</td>
<td>5.73</td>
<td></td>
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<tr>
<td>Residence Status</td>
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<td>[.02, .11]</td>
<td>98.18</td>
<td>18.76</td>
<td></td>
</tr>
</tbody>
</table>

Note: \(R^2 = \text{Proportion of outcome variable variance explained by predictors, } p < .05, **p < .001\). Cohen’s \(f^2\) = effect size. Step 1: \(R^2 = .23, F(4, 151) = 11.37, p < .001\); Cohen’s \(f^2\) = .34. Step 1 to Step 2: \(R^2 = .30, F(7, 144) = 11.37, p < .001\); Cohen’s \(f^2\) = .34.

**References**


Hezlett, S. A., Ones, D. S., & Hezlett (Eds.), Predicting performance: The interface of I/O psychology and educational research. Symposia conducted at the annual conference of the Society for Industrial and Organizational Psychology, San Diego, CA.


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Compensatory health beliefs (CHB) represent a strategy in which individuals believe they can compensate for, or negate, an unhealthy behavior by subsequently engaging in a healthy behavior (Knäuper, Rabiau, Cohen, & Patriciu, 2004). CHB represent the cognitive process of contemplating a healthy behavior to counteract an unhealthy behavior, but do not include the actual completion of the behavior itself. CHB can also be considered an affective state, as individuals reduce cognitive dissonance and guilt that arises from making recognizably unhealthy choices. Despite this potential benefit, the use of CHB has been linked to unhealthy outcomes (Knäuper et al., 2004). For example, the healthy behavior does not always nullify the unhealthy one such as exercise failing to counteract the unhealthy consequences of smoking. In addition, the use of CHB frequently coincides with engaging in an unhealthy behavior in order to justify its occurrence, but the compensatory behavior does not follow (e.g., planning to exercise later but not doing so). Therefore, no benefit is applied, and the negative impact of the unhealthy action is not reduced (Knäuper et al., 2004).

Rabiau, Knäuper, and Miquel (2006)
developed a theoretical framework to explain how CHB are employed. They argued that unhealthy desires pitted against healthy goals create motivational conflict. Individuals have the option of changing their goals, resisting the desire, or engaging in CHB. Given these options, CHB are a relatively passive and simple way of responding to this conflict. The existence of this theoretical concept has received experimental support, especially in the context of dieting. Kronick and Knäuper (2010) presented female dieters with a high caloric temptation. Dieters who formed the intention to behaviorally compensate for giving into the temptation were more likely to indulge. In a similar study, dieters who held compensatory beliefs and formed intentions to compensate for caloric overindulgence were likely to consume more calories (Kronick, Auerbach, Stich, & Knäuper, 2011). Miquelon, Knäuper, and Vallerand (2012) likewise documented that dieters who engaged in compensatory thinking were less likely to be successful in achieving their overall dieting goals. Collectively, these studies have indicated that the use of CHB interferes with dieters’ ability to attain their weight loss goals.

CHB have also been demonstrated in the context of clinical populations where unhealthy behaviors may have more severe consequences. Täut and Băban (2008) examined the use of CHB in patients with heart disease. Their results suggested that CHB are linked to unhealthy eating choices. CHB were used more often by patients who failed to plan for unexpected situations in which they had to make dietary choices and by patients who were not as deeply concerned about the outcomes of their nutritional choices. Individuals who had a self-determined motivation or self-efficacy to meet their specific health goals were less likely to engage in CHB or were more likely to complete the compensatory behavior following the activation of CHB (Täut & Băban, 2008). The findings suggested that individuals may have characteristics such as feelings of self-efficacy that make them more or less likely to rely on CHB.

Adolescents also exhibit CHB use. For example, adolescents with type 1 diabetes who more frequently held CHB related to keeping track of their blood sugar had more difficulty adhering to their treatment plans (Rabiau, Knäuper, Nguyen, Sufrategui, & Polychronakos, 2009). This finding held true even for adolescents who were knowledgeable about diabetes and its potential health consequences. When the CHB scale was adapted to study smoking-specific CHB in adolescent smokers, results revealed that the more that smokers engaged in CHB, the less ready and willing they were to stop smoking (Radtke, Scholz, Keller, Knäuper, & Hornung, 2010). In other words, convincing themselves that they were compensating for smoking with other behaviors was linked to a continuation of the unhealthy smoking behavior. Although Täut and Băban (2008) demonstrated that self-efficacy reduced the use of CHB, Radtke et al. (2010) found that self-efficacy did not moderate the relation between smoking cessation readiness and CHB use in adolescents.

The previous research has clearly documented a relation between CHB use and unhealthy behavioral choices. In addition, previous research has provided evidence that self-efficacy or self-determined motivation can increase or decrease the use of CHB in adults. Täut and Băban (2008) found that CHB use is decreased when individuals have the self-efficacious belief that they are capable and able to avoid the unhealthy behavior. In contrast, Rabiau et al. (2006) proposed that CHB use increases when individuals are motivated by self-efficacy to engage in an unhealthy behavior because they feel capable and able to also engage in the compensatory behavior. This mediating impact of self-efficacy was not seen in adolescents (Radtke et al., 2010). One possible explanation is that self-efficacy may require a certain level of cognitive development before being expressed in this context or that adolescents are more varied than adults in how self-efficacy influences their behavior. Another possibility is that self-efficacy simply is not a consistent predictor of CHB.

If self-efficacy does not consistently predict CHB use, the question arises as to whether there may be other mediating factors related to the application of CHB. For example, impulsivity has been linked to unhealthy behavior such as alcohol consumption and gambling (Braddock et al., 2011; Lovatto, 2013; Tang & Wu, 2012). Like CHB use, impulsivity also predicts greater difficulty in withstanding the temptation of high-caloric snacks (Churchill & Jessop, 2011). The counterpart to this impulsivity data is that individuals who consider future consequences before acting are more likely to engage in healthy behaviors such as dieting and exercise (Adams & Nettle, 2009; Piko & Brassai, 2009). Because of their strong links to behavioral choices, it is likely that impulsivity and consideration of future consequences will also
be related to CHB.

Another factor that predicts health behavior is coping style. Coping styles are global strategies that people employ to deal with stressful situations. In general, active coping strategies such as exercising are linked to healthier outcomes than passive coping strategies such as ignoring a problem (Schmidt, Blank, Bellizi, & Park, 2012). CHB have been conceptualized as a strategy to cope with motivational conflict, cognitive dissonance, and guilt (Knäuper et al., 2004; Rabiau et al., 2006). Thus, CHB and coping may be related concepts.

Previous researchers established the link between CHB use and unhealthy behavioral choices, as well as postulated self-efficacy as a mediating factor with mixed empirical results. We examined whether previously unexplored factors such as impulsivity and consideration of future consequences may be more predictive of CHB than self-efficacy, with the goal of increasing our understanding of this relatively new construct. We also examined whether the specific strategy of CHB use, which occurs when a potentially stressful health decision must be made, relates to more global coping strategies. If so, CHB use may be part of a larger pattern of employing unhealthy strategies to deal with stressful situations.

In order to make comparisons with previous research, we assessed whether smoking or drinking alcohol was related to more frequently used CHB, and we asked participants one question to assess their current health level. Whereas previous research targeted dieters, smokers, or clinical patients, our study investigated CHB across adults to add to our knowledge about the prevalence and employment of this construct. The research was conducted across two studies, allowing for testing of these initial hypotheses followed by a refined examination of the salient results in relation to other variables.

Study 1: Relations Among CHB, Impulsivity, Consideration of Future Consequences, and Coping Styles

We hypothesized that:

1. CHB use would be positively associated with impulsivity and negatively associated with consideration of future consequences.

2. CHB use would be positively associated with maladaptive coping styles and negatively associated with adaptive coping styles.

3. Participants who smoked or drank alcohol would be more likely to engage CHB.

We did not make a directional hypothesis in regard to CHB use and self-reported perception of health because CHB use could give users a perception of healthiness, or CHB use could be a strategy to cope with perceptions of poor health. This element of the research was exploratory.

Method

Participants

Participants were 60 adults, 46 women, and 14 men, with a mean age of 29.12 years ($SD = 12.54$). Seventy-five percent identified as White American, 13% as Black American, and the remainder as other ethnicities. Seventy-five percent of participants self-reported as being nonsmokers, and 32% reported never drinking alcohol.

Materials

Participants responded to a questionnaire that included the CHB Scale (Knäuper et al., 2004). The CHB Scale assesses a participant’s likelihood of engaging in CHB. The scale consists of 17 items that include four areas where CHB may be used: substance use (i.e., alcohol, nicotine, and caffeine), eating and sleeping habits, stress, and weight regulation. A sample question for weight regulation is “Eating whatever one wants in the evening is OK if one did not eat much during the day.” Sample questions for substance abuse are “Exercising can compensate for smoking” and “Not drinking alcohol during the week can make up for the effects of drinking too much alcohol during the weekend.” We asked participants “How often do you personally think the following?” and they responded on a Likert scale ranging from 1 (never) to 5 (always). A higher score indicates greater frequency of CHB related to that area of life. The published reliability for these scales is Cronbach’s alpha of .80 (Knäuper et al., 2004), and we calculated a Cronbach’s alpha of .79.

Participants responded to the Barratt Impulsiveness Scale (Patton, Stanford, & Barratt, 1995), a widely used 30-item, self-report measure of impulsiveness. Items are scored on a 4-point scale from 1 (rarely/never) to 4 (almost always/always). A sample item is “I say things without thinking.” Patton et al. (1995) reported internal consistency coefficients for the BIS-11 total score that range...
 Participants also responded to the Consideration of Future Consequences Scale (CFC; Strathman, Gleicher, Boninger, & Edwards, 1994). This 12-item scale assesses how individuals consider future consequences when choosing their behaviors. However, we used eight items that have exhibited greater reliability than the original scale (Petrocelli, 2003). Responses are made on a 5-point scale, where 1 represents extremely uncharacteristic and 5 represents extremely characteristic, with some items reverse-scored. A sample item is “I only act to satisfy immediate concerns, figuring the future will take care of itself.” A higher score indicates greater consideration of future consequences. Strathman et al. (1994) reported internal consistencies ranging from .80 to .86. However, other researchers have reported reliabilities in the .72 to .77 range (Toepoel, 2010). Our Cronbach’s alpha for this scale was .65.

To examine coping styles, participants responded to the 18-item Coping Scale (Halverson, Bliese, Moore, & Castro, 1995). Responses are made on a Likert scale from 1 (never) to 5 (always). Coping was classified as maladaptive or adaptive. Maladaptive strategies included avoidant (e.g., ignoring the problem or finding ways to avoid dealing with it) and unhealthy (e.g., drinking alcohol or complaining to others) behaviors. Adaptive coping was construed as an individual engaging in an active behavior designed to solve the problem (e.g., considering different options or looking for information about choices). Our Cronbach’s alpha was .73 for the avoidant subscale, .65 for the unhealthy subscale, and .49 for the adaptive subscale. It is worth noting that reliabilities for these scales are lower than what is typically preferred because respondents are given a wide range of options; each respondent could engage in some but not all of the behaviors included in each subscale, which results in lower, but not surprising, internal consistency. Last, we asked participants for demographic information including a question to assess their current level of health on a 5-point scale, with a higher number representing better health.

Procedure
We used convenience sampling. Participants were recruited from undergraduate classrooms, a university waiting area, and the workplace of the researcher. These venues were chosen with the goal of recruiting a diverse range of participants. Participants were asked whether they were willing to take part in a research study. Upon agreeing, each participant was provided an informed consent letter in the presence of the secondary author. The author asked the participants if they had any questions and whether they wanted to continue. Adults who chose to participate were handed a survey, and the researcher moved away, providing the participants with privacy. Participants were given as much time as they needed to complete the survey, and surveys were placed in a large manila envelope by the participants upon completion. To further ensure participants’ confidentiality, the surveys were not removed from the envelope and viewed until the entire data set was collected. The university’s institutional review board approved the study. Participants received no incentives for participation, and all participation was voluntary.

Results
Higher CHB scores were positively correlated with impulsivity, $r(58) = .43, p = .001$, and negatively correlated with CFC, $r(56) = -.44, p = .001$. Participants who scored higher on overall CHB were more likely to engage in the two maladaptive coping strategies: avoidant coping, $r(59) = .38, p = .003$, and unhealthy coping, $r(57) = .47, p < .001$. These correlations represented medium effect sizes. CHB were not associated with adaptive coping strategies.

Participants’ mean rating of their overall health was 3.51 ($SD = 0.95$) on a 5-point scale. Participants’ health ratings did not predict CHB use. We compared self-reported smokers ($n = 45$) to nonsmokers ($n = 14$) and drinkers ($n = 41$) to nondrinkers ($n = 19$) using independent $t$ tests. Compared to nonsmokers, participants who smoked had higher CHB scores, $t(57) = -2.36, p = .02$, reflecting a small effect size (.30). The two groups did not differ in terms of age, $t(57) = -1.17, p = .25, ns$, and the race and sex distribution for each group matched the sample as a whole. There was no significant difference in the CHB scores of participants who drank alcohol and those who did not, $t(57) = -1.39, p = .17, ns$. The two groups also did not differ in terms of age, $t(57) = -1.14, p = .26, ns$, and the race and sex distribution for each group matched the sample as a whole.

Discussion
We hypothesized that frequency of CHB use would be positively associated with impulsivity and negatively associated with consideration of future
Compensatory Health Beliefs

Sleigh and Campbell Westmoreland

compensatory thinking in regard to health. The more heavily participants relied on CHB, the more impulsive and less concerned about the future they were, indicating a greater focus on immediate rewards than distal consequences. This finding matched previous research demonstrating that failure to consider future consequences is associated with risky behavior such as increased smoking (Adams & Nettle, 2009). If CHB offer a short-term solution to a challenging situation with potentially long-term consequences, then CHB are ostensibly more appealing to those who give more attention to immediate outcomes than future consequences. In other words, CHB may offer people a guilt-free way to indulge in their impulses and a way to rationalize the repercussions of their behavior. The concern is that, once the negative emotional component is minimized, unhealthy behaviors and the corresponding physical consequences are likely to increase.

Rabiau et al. (2006) originally hypothesized that self-efficacy was a personality characteristic that would increase CHB use, whereas Täut and Băban (2008) experimentally demonstrated that self-efficacy decreased CHB use. Our data suggested that impulsivity and low consideration of future consequences are two additional characteristics that influence CHB use. However, this case is less ambiguous because both variables increase the likelihood of an individual using CHB. Correlational research does not specify whether CHB allow the development of these characteristics or are a product of them, however the more logical explanation of the two options is that impulsivity and a lower concern for long-term consequences are catalysts for short-term unhealthy decisions. Impulsivity and lower consideration of future consequences can be considered trait-based characteristics, whereas CHB use is conceptualized as a strategy to deal with specific situations.

We also hypothesized that CHB use would be positively associated with maladaptive coping styles and negatively associated with adaptive coping styles. This hypothesis was partially supported. The more participants relied on CHB, the more they relied on maladaptive coping strategies. This finding suggested that CHB may be considered an unhealthy coping strategy that is distinct from but highly related to other unhealthy coping strategies. In other words, individuals who frequently engage in compensatory thinking in regard to health choices are also likely to deal with life stressors by avoidance. Similar to CHB, maladaptive coping strategies are a way of dealing poorly with cognitive stress. Avoidant coping and holding CHB share the additional characteristic of being passive, rather than active, reactions to external stressors.

In our results, CHB use was not related to reliance on adaptive coping strategies. In other words, some individuals with high CHB ratings may use healthy coping strategies and some may not. Thus, the presence of CHB does not represent the absence of healthy coping styles as we predicted. The Cronbach’s alpha for the scale was relatively low, which might have prevented our ability to establish a clear link between CHB use and healthy coping and was a limitation of this subscale analysis. Another plausible explanation is that the list of healthy coping behaviors used in our measure included behaviors that participants might have considered within CHB as compensation for unhealthy actions. For example, an individual who decided to exercise to compensate for smoking might have scored higher on the “consider different options” component of the adaptive coping behaviors measure, thus revealing a positive relation between CHB use and adaptive coping. In contrast, another individual might have planned to exercise as part of his CHB but lacked the “follow through” to ultimately take that positive action, resulting in a negative relation between CHB use and healthy coping.

The same argument may explain why our participants’ responses did not reveal a link between CHB use and perceptions of health. Some adults have CHB and follow through with the compensatory behavior, resulting in improved perceptions of self-health. Other adults may fail to engage in the compensatory behavior, resulting in decreased perceptions of self-health. We assessed health perceptions with one question, which was a limitation of this study that also might have contributed to our lack of significant findings.

Our analyses revealed that smokers were more likely to use CHB than nonsmokers, but this pattern was not true in relation to alcohol consumption. Smoking might have elicited a greater need for CHB use because any amount of smoking is known to be detrimental, whereas alcohol consumption is not always problematic. Radtke et al. (2010) found that adolescents who used CHB were more likely to continue smoking. Unlike other studies, Radtke et al. (2010) also found that self-efficacy did not moderate the relation between smoking cessation readiness and CHB use in adolescents. One possibility for these findings is that self-efficacy...
is a developmental issue. In the context of our findings, an alternative is that the guilt from engaging in the completely unhealthy behavior of smoking elicits such a great need for CHB that self-efficacy becomes less relevant.

Individuals must have some basic knowledge of what is considered unhealthy (e.g., smoking is unhealthy), or they would not need CHB to reduce cognitive dissonance while contemplating an unhealthy choice. The question arises as to how greater health knowledge relates to CHB use, which was not clearly answered based on the single item in Study 1. Perhaps people with extensive health knowledge are more willing to engage in CHB because they experience more distress when they contemplate an unhealthy behavior, but knowing the full risks associated with an unhealthy behavior also means that more cognitive energy is required to rationalize CHB use. For example, individuals who know the full risks of smoking will have a more difficult time convincing themselves that an exercise class is an adequate compensation for smoking. CHB are a passive fix to an immediate problem, favored by people with impulsive tendencies who do not spend a great deal of time considering the future, so the more effort CHB require, the less they may be employed. Thus, it may be more likely that individuals with limited health knowledge find it easier to engage in CHB because they are only minimally aware of the consequences of their unhealthy choices.

In sum, the results from Study 1 demonstrated that individual characteristics such as impulsivity and reliance on maladaptive coping strategies are associated with increased employment of CHB. Participants who smoked also used CHB, but an increased use of CHB did not relate to participants perceiving themselves as less healthy. The purpose of the second study was to examine the connection between CHB and an individual’s knowledge about healthy behaviors, as well as how age and education relate to health knowledge and CHB use. In this study, the CHB scale was modified such that participants responded in terms of actual behavior rather than based on their general beliefs about how they and other people might behave. In Study 1, participants’ perceptions of their health was assessed with one item. In Study 2, health was assessed with a longer, more comprehensive measure. With a larger sample size, we also examined whether the relation between CHB and maladaptive coping seen in Study 1 would be maintained when participants were focused on their own behavior.

**Study 2: Relations Between CHB, Coping Styles, and Health Perceptions**

We hypothesized that:

1. CHB use would be positively associated with maladaptive coping styles and not significantly associated with adaptive coping styles.

2. CHB use would be negatively correlated with knowledge about healthy behaviors and with engagement in healthy behavior.

3. CHB use would be negatively correlated with age and education level.

**Method**

**Participants**

Participants were 140 adults, 116 women, and 24 men, with a mean age of 31.44 years (SD = 13.86). Of those, 84% identified as White American, 13% as Black American, and the remainder as other ethnicities. Ninety percent of participants had participated in education beyond high school, and the other 10% had earned either a GED or a high school diploma.

**Materials**

Participants responded to an online questionnaire. The survey included the same demographic questions from Study 1, with the addition of a question assessing participants’ formal educational level. We modified the original CHB Scale (Knäuper et al., 2004) to reflect personal ownership of the use of CHB. The modified instructions asked participants to “Answer the following based on your own beliefs and behaviors.” We reworded the questions from an impersonal statement to one in which the word you was inserted. For example, the item “Skipping the main dish can make up for eating dessert” was changed to “Is eating dessert OK if you skip the main dish?” A modified sample question related to sleeping habits was, “Do you ever sleep in on the weekends to make up for lost sleep during the week?” Participants responded on the same Likert scale from 1 (never) to 5 (always) as was used in Study 1. A higher score indicated greater frequency of CHB use related to that area of life. This modified scale had a Cronbach’s alpha of .72, similar to that of the original scale.

In addition, we created a 14-item scale comprised of elements similar to those used in the Coping Scale (Halverson et al., 1995) and the...
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Brief COPE (Carver, Scheier, & Weintraub, 1989). We used items from the Coping Scale that were more frequently selected by participants as coping behaviors and selected items from the Brief COPE that were relevant to our study’s focus. The questions were designed to measure the tendency toward an adaptive or maladaptive coping style, and participants were asked, “How often do you do the following when you are stressed?” Seven adaptive behaviors included changing the stressor, exercising, and viewing the situation in a different light ($\alpha = .71$). Maladaptive strategies included ignoring the problem, drinking alcohol, and blaming self ($\alpha = .64$). Again, this relatively low reliability score might have resulted from participants who engaged in some behaviors such as ignoring the problem but not every behavior such as drinking alcohol.

We created 20 original items inquiring about participants’ health beliefs, health knowledge, and health behaviors. Six questions asked participants to rate their knowledge on health topics such as sleep, exercise, and dietary guidelines. A sample question is, “I know the risks of smoking.” Six questions asked participants how often they engaged in specific healthy behaviors each week, for example, “How often do you engage in at least 30 min of heart rate elevating physical activity/exercise per week?” Five questions asked participants how often they felt they should engage in specific health behaviors, for example, “How often should you try to get at least eight hr of sleep per night per week?” Three additional questions asked participants to rate their current health, the healthiness of their daily habits, and how certain they were that they needed to change their behaviors in order to become healthier. All responses were made on a 5-point Likert-type scale with a higher number indicating greater knowledge or healthiness. These questions were created to obtain a personal assessment of the participants’ health knowledge and habits in the areas generally highlighted by the CHB Scale: stress, sleep, diet and substance use (Knäuper et al., 2004).

Procedure

Participants were recruited via social media such as Facebook using a snowball sampling technique. Potential participants were provided with a link to the online survey and asked to post the link on their social media sites. The survey was posted for a period of three weeks. All participation was voluntary and anonymous, and the study was approved by the university’s institutional review board.

Results

Participants with higher CHB scores were more likely to use maladaptive coping strategies, $r(122) = .47, p < .001$, representing a medium effect size. CHB use was not associated with adaptive coping strategies. See Table 1 for all correlations.

Participants with lower CHB scores rated themselves as more knowledgeable about general health issues, $r(124) = -.21, p = .02$. When asked about specific health issues, participants with lower CHB scores reported that they had a greater knowledge of the minimum recommended amounts of physical activity needed to maintain health, $r(122) = -.35, p < .001$, and were more knowledgeable about the health risks of stress, $r(123) = -.19, p = .04$. On the other hand, the higher the CHB score, the more frequently participants believed a person could smoke without incurring any health risks, $r(124) = .18, p = .04$.

Participants with higher CHB scores rated their daily habits as less healthy, $r(124) = -.23, p = .009$. When we examined specific health behaviors, participants higher in CHB use reported eating fast food more often, $r(124) = .22, p = .02$. Despite these significant associations, higher CHB use did not predict participants’ feelings that their behaviors should change in order to become healthier. The CHB correlations reflected small effect sizes but painted a consistent picture of CHB being associated with lower health knowledge and unhealthy behaviors.

The higher the CHB score, the younger the participant, $r(124) = -.41, p < .001$, and the less formal education the participant had completed, $r(124) = -.32, p < .001$. Age and education were also positively correlated, $r(140) = .47, p < .001$. These correlations reflected medium effect sizes.

To further investigate these age-related findings, we divided participants into three age groups: 18 to 25 ($n = 72$), 26 to 40 ($n = 35$), and 41 to 68 ($n = 33$), and compared them with a Multivariate Analysis of Variance and Tukey’s posthoc analyses. Compared to the youngest group, the oldest respondents scored lower on CHB use, $F(2, 121) = 6.29, p = .003$, and higher on their self-reported knowledge of health issues, $F(2, 137) = 3.47, p = .03$. The three groups did not differ on how healthy they perceived their daily behaviors to be.

In order to test whether the variables that were related to CHB also created a predictive model of CHB use, we ran a multiple regression analysis. The predictors were maladaptive coping strategies, knowledge about general health issues,
healthiness of daily habits, age, and education, and the criterion variable was CHB score. The linear combination of variables was significantly related to CHB use, \( F(5, 116) = 12.20, p < .001 \). The sample multiple correlation coefficient was .59, indicating that approximately 35% of the variance of CHB use in the sample was accounted for with this model. Only two of the five indices were statistically significant \((p < .01)\). The most meaningful predictors of CHB use were age \((\beta = .159, p = .002)\) and maladaptive coping \((\beta = .744, p < .001)\). These variables alone accounted for 31% \((R = .558; R^2 = .31)\) of the variance of CHB use, and the other variables contributed only an additional 4%.

The increased use of maladaptive coping styles was associated with participants reporting themselves to be less informed about general health issues, \( r(136) = -.22, p = .009 \), and to have daily habits that were less healthy, \( r(136) = -.26, p = .002 \). For specific behaviors, participants who were more likely to use maladaptive coping reported knowing less about physical activity guidelines, \( r(135) = -.26, p = .003 \), the risks of alcohol consumption, \( r(135) = -.20, p = .02 \), and the risks of stress, \( r(136) = -.20, p = .02 \). Participants higher in maladaptive coping also exercised less frequently, \( r(137) = -.26, p = .002 \), ate fast food more often, \( r(137) = .39, p < .001 \), and got fewer nights of 8 hr or more of sleep, \( r(135) = -.18, p = .03 \). These correlations reflected small to medium effect sizes.

In contrast, participants with high adaptive coping strategies reported having daily habits that were healthy, \( r(136) = .33, p < .001 \). Specifically, these participants reported exercising for at least 30 min more times during a week, \( r(136) = .37, p < .001 \), eating more fresh fruits and vegetables, \( r(135) = .30, p < .001 \), and sleeping for 8 hr per night more times during a week, \( r(136) = .17, p = .04 \). Participants higher in adaptive coping strategies also reported being more knowledgeable about dietary guidelines, \( r(135) = .25, p = .004 \), physical activity guidelines, \( r(134) = .28, p < .001 \), the risks of stress, \( r(135) = .26, p = .003 \), and the importance of sleep, \( r(135) = .22, p = .01 \). These correlations reflected small to medium effect sizes.

The health related behaviors and knowledge that did not relate to CHB, adaptive coping, maladaptive coping, or age were “I need to change certain behaviors in order to be healthier,” “I know the importance of sleep,” “How often do you smoke per week,” “How often do you drink alcohol per week,” “How often do you eat fresh foods per week,” “How often should you get at least eight hr of sleep/night per week,” and “How often should you get at least eight hr of sleep/night per week.”

**Discussion**

The results of this study, using a larger sample, supported the findings of Study 1 in relation to CHB and coping strategies. Using the modified scales that prompted participants to reflect on their own behaviors, CHB were once again concomitant with maladaptive coping styles and were unrelated to adaptive coping behaviors. Our findings also supported previous research demonstrating that adaptive coping is associated with better health, although maladaptive coping is associated with compromised health (Schmidt et al., 2012).

Study 2 results suggested that CHB are also linked to lower levels of health knowledge. Participants higher in CHB reported that they were less knowledgeable about health in general as well as less knowledgeable about the health aspects of physical activity, stress, and smoking. One possible explanation is that higher levels of health knowledge block the use of CHB because knowledge interferes with the reduction of cognitive

<table>
<thead>
<tr>
<th>Significant Relations Among Compensatory Health Beliefs (CHB), Coping Styles, Age, and Health Behaviors</th>
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<tbody>
<tr>
<td>CHB</td>
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<tr>
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<tr>
<td>I am well-informed about my general health.</td>
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<tr>
<td>My daily habits overall are healthy.</td>
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<tr>
<td>I know and understand dietary guidelines.</td>
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<tr>
<td>I know and understand the minimum physical activity recommended for adults.</td>
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<tr>
<td>I know the risks of alcohol consumption.</td>
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<td>I know the risks of stress.</td>
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<td>I know the importance of sleep.</td>
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<tr>
<td>How often do you engage in 30 min of heart-rate-elevating physical activity per week?</td>
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<tr>
<td>How often do you eat fast food per week?</td>
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<tr>
<td>How often do you eat fresh fruits and vegetables per week?</td>
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<tr>
<td>How often is it safe to smoke per week?</td>
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<td>How often do you drink alcohol per week?</td>
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<td>How often is it safe to drink alcohol per week?</td>
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Note: \( p < .05; ** p < .01 \). CHB represent a strategy in which individuals believe they can compensate for, or negate, an unhealthy behavior by engaging in a healthy behavior (Knauper, Rabiau, Cohen, & Patriciu, 2004).
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dissonance. For example, if a person knows that one exercise class will not counteract smoking, then planning to exercise will not reduce the cognitive dissonance associated with smoking. CHB would therefore be ineffective and are unlikely to be used.

Iso-Ahola (2013) recently argued that exercise and other health behaviors are commonly conceptualized as a means to an end, rather than being viewed as having inherent value. In this case, individuals may be more prone to view a healthy behavior as something that must be done to compensate for a desirable unhealthy behavior. However, because exercise is the punishment for the desired behavior, it may not occur. Iso-Ahola’s (2013) rationale overlaps and supports the CHB construct.

Our findings also revealed that individuals higher in CHB reported that their daily habits were less healthy; and they were more likely to eat fast food. In other words, CHB use was linked to poorer health choices. These results may overlap our finding that CHB use was also linked to lower health knowledge. Adults whose understanding of health guidelines is incomplete have more difficulty adhering to those guidelines and are more likely to use CHB when confronted with making health choices. Täut and Băban (2008) reported similar findings; heart disease patients who were more concerned about their nutrition choices were less likely to employ CHB.

It is noteworthy that the relation between CHB and health knowledge, and CHB and health behaviors revealed small effect sizes, and these two variables were not highly predictive of CHB use. One possibility is that, because health is a societal concern, health education is widely available, resulting in commonalities of health knowledge. Another interpretation is that CHB use, leading to decreased distress, may be tempting for all individuals, regardless of their health. Rabiau et al. (2009) found that even adolescents who were knowledgeable about diabetes were vulnerable to compensatory thinking that interfered with their medical treatment. Finally, the weak relationship may reveal that the way people make health choices is a complex cognitive process impacted simultaneously by numerous variables. Our study alone added multiple predictive variables to the originally proposed model (see Figure 1).

In contrast, age emerged as a significant predictor in the likelihood of CHB use. Younger adults reported using CHB more frequently than older adults. Age was also positively associated with self-perceptions of greater health knowledge and higher education. Education combined with life experience may play a pivotal role in developing healthy cognitive strategies, thereby reducing the likelihood of CHB occurrence. This explanation may offer insight as to why self-efficacy influenced CHB use in adults but not in adolescents in previous research (Radtke et al., 2010; Täut & Băban, 2008). Adolescents may not have the education and experience to develop self-efficacy in relation to their own health in the same manner as older adults. This age-related finding may also be a result of unhealthy choices having more obvious consequences for older adults. For example, a young adult who does not get enough sleep may be able to function better than an older adult who has lost the same amount of sleep. In this case, it is easier for the young adult to engage the compensatory health belief that sleeping more on the weekend makes up for a lack of sleep during the week than it would be for an older adult.

**General Discussion**

Although CHB were consistently related to a maladaptive coping style, CHB and general coping style can still be considered distinct constructs. CHB are a situation-specific coping mechanism. They are activated in response to the particular discomfort that arises from cognitive dissonance related to choices that affect one’s health (Knäuper et al., 2004). Coping styles, as measured in these two studies, are more globally defined as strategies that people employ across myriad stressful situations. Our results revealed that people who use unhealthy global coping strategies are also likely to engage in condition-specific CHB in situations where health behavior decisions need to be made. If this is true, then these individuals are likely to experience negative outcomes related to unhealthy cognitive patterns in multiple realms of their lives.

A pattern emerges from this data pointing toward training as a valuable tool in overcoming CHB use and the associated negative outcomes. Age, tied to experience and education, was related to a decrease in the use of CHB. Individuals who are educated about health and encouraged to make thoughtful decisions may be more likely to reject compensatory beliefs. Previous research has demonstrated that better health decisions result when individuals utilize mindfulness, or increased attention, to their decisions (Black, Sussman, Johnson, & Milam, 2012). In other words, when people are trained to focus their attention and
knowledge on a specific behavior, they are less likely to behave impulsively and employ CHB. CHB use is a strategy used to reduce cognitive dissonance, and this reduction is highly motivating (Aronson & Mills, 1959). Thus, training efforts may need to include specific elements of dissonance-based interventions to be effective (Stice, Shaw, Becker, & Rohde, 2008; Stone & Fernandez, 2008). Stone and Focella (2011) argued that confronting individuals with their own hypocrisy in this manner is critical in improving decision-making.

Both of the current studies faced limitations. The unequal sample size in the two studies influenced the statistical power of the presented statistics. In Study 2, the use of multiple correlations raised the possibility of a family wise alpha error, which we attempted to address with multivariate analysis. As discussed, the adaptive coping scale had lower reliability than is preferred and may have masked a relation between reliance on CHB and adaptive coping. In addition, although similar to other research in this domain, self-report data has inherent limitations such as social desirability, self-serving bias, and inaccurate recall. We attempted to minimize social desirability as much as possible by allowing participants privacy and taking visible measures to ensure confidentiality.

The studies faced additional challenges in terms of generalizability. The participant pool included a disproportionate number of young adults who were recruited via convenience, rather than random, sampling. A larger percentage of male participants and more racial diversity among the participants would also have provided for improved generalizability. Despite these weaknesses, we demonstrated the existence of CHB in a broader sample than did previous studies (Rabiau et al., 2009; Radtke et al., 2010).

Future researchers may want to determine if CHB are specifically associated with maladaptive behaviors such as eating disorders, substance abuse, or overexercising. Such an investigation could lend more insight into the dynamics of those behaviors and allow clinicians and other therapeutic practitioners to more thoroughly understand the obstacles faced by clients attempting to correct those behaviors. CHB may also be more frequently used in certain populations such as individuals who follow strict dietary guidelines due to religious, ethical, or medical reasons. These situations are distinct from the aforementioned behaviors in that religious, ethical, or medical considerations do not stem from maladaptive strategies but instead may be viewed as imposed restrictions outside of individual control.

In addition, drawing parallels between CHB and excessive stress, methods of stress management, and the connection between stress and cognition could identify a new element in the exploration of how stress affects health. Because it appears that CHB and coping style are closely related, and stress management evolves from one’s coping mechanisms, the incorporation of the CHB model into the current inquiries on stress and health could yield new strategies to help individuals decrease distress and make healthier decisions.

Future researchers may also want to consider a more multidimensional assessment regarding how an individual’s temporal orientation influences CHB. The way in which an individual emotionally focuses on one aspect of time (e.g., past, present, or future) relative to other aspects of time, impacts that individual’s daily decisions, behaviors, and plans (Zimbardo & Boyd, 1999). For example, individuals who tend to focus on the present are more likely to self-report substance use (Keough, Zimbardo, & Boyd, 1999; Wills, Sandy, & Yaeger, 2001), but those who focus on the future are more likely to engage in proactive coping (Anagnostopoulos & Griva, 2012). The relation between temporal orientation and health-related outcomes may be moderated by an individual’s desire for control over the situation (Fieulaine & Martinez, 2010). CHB provide users with a perception that they are controlling the consequences of their unhealthy behaviors, but their assumptions are not always accurate. Thus, future researchers also may want to investigate how a desire for control relates to CHB and temporal orientation.

In sum, our studies revealed that impulsivity and less emphasis on future consequences are related to increased reliance on CHB. These variables appear to be stronger predictors for CHB use than self-efficacy, the previously postulated mediator. In addition, we found that an individual’s CHB tended to co-occur with an overall maladaptive coping style, suggesting that CHB use may be part of a larger strategy for dealing with stressful situations. Reduced reliance on CHB was related to age, education, health knowledge, and healthy behaviors in a nonclinical population. These findings added to our evolving understanding of this relatively new construct and suggested that improving individuals’ awareness of their own health-related cognitions may enable them to optimize their health choices.
References


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Eating disorders are a growing problem among women in western cultures. In a prevalence study on eating disorders in women, researchers found lifetime prevalence rates of 0.9% for anorexia nervosa, 1.5% for bulimia nervosa, and 3.5% for binge-eating disorder (Hudson, Hiripi, Pope, & Kessler, 2007). Gutzwiller, Oliver, and Katz (2003) found that 12% of women met the DSM-IV criteria for an eating disorder. However, these numbers did not include the number of women suffering from eating dysfunctions. Women with eating dysfunctions do not meet the diagnostic criteria for an eating disorder, yet still exhibit maladaptive symptoms commonly seen in those diagnosed with an eating disorder. For example, a woman who severely restricts her food intake and has an intense fear of becoming fat would not meet the strict diagnostic criteria for anorexia nervosa, but would still exhibit obvious maladaptive eating attitudes and behaviors.

Twenty-two percent of women surveyed in the United States displayed some symptoms of an eating disorder often without meeting the stringent criteria for an eating disorder diagnosis (Gutswiller et al., 2003). Of important note, women displaying symptoms of an eating dysfunction have been found to display similar difficulties compared to a clinical population of women diagnosed with eating disorders (Klemchuk, Hutchinson, & Frank, 1990). Garner, Olmsted, Polivy, and Garfinkel (1984) compared women classified as weight preoccupied, meaning that they were highly concerned about their weight, to women diagnosed with anorexia nervosa. No statistically significant differences existed between those classified as weight preoccupied and those diagnosed with anorexia nervosa on measures assessing bulimic symptoms, body dissatisfaction, and perfectionist tendencies.

**Levels of Disordered Eating: Depression, Perfectionism, and Body Dissatisfaction**

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Central Connecticut State University

**ABSTRACT.** The present study investigated levels of depressive symptoms, perfectionist tendencies, and body dissatisfaction in women with different levels of eating dysfunction. Eighty-nine women from a Northeastern university participated in exchange for course credit. Participants were categorized as having an eating disorder, eating dysfunction, or exhibiting normal eating attitudes and behaviors. Results revealed that those with maladaptive eating attitudes and behaviors displayed more body dissatisfaction ($\eta^2 = .23$) and depressive symptoms ($\eta^2 = .08$) than those with normal eating attitudes and behaviors. Women with a high fear of becoming fat displayed higher levels of body dissatisfaction ($\eta^2_p = .36$) and depressive symptoms ($\eta^2_p = .08$) than women less concerned about body fat. In short, women with eating disorders and dysfunctions exhibited similar levels of depressive symptoms, perfectionist tendencies, and levels of body dissatisfaction. The present study and many others have implied that the current classification system used to diagnose eating disorders does not encompass the range of severity that women with eating problems might experience and that a dimensional approach to diagnostic assessment is advised.
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(Garner et al., 1984). These results indicated that women with eating dysfunctions likely engage in harmful dieting behaviors and report similar negative attitudes about their bodies compared to women diagnosed with an eating disorder. The differences among those diagnosed with an eating disorder, those who display symptoms of an eating dysfunction, and those with normal eating attitudes and behaviors need to be further explored. Comparisons could inform future changes to the classification system used to diagnose eating disorders.

Women who have an eating disorder or dysfunction often exhibit similar internalizing symptoms. Body dissatisfaction, perfectionism, and depression are common symptoms in women displaying maladaptive eating attitudes and behaviors. Due to this commonality, the role of body dissatisfaction, perfectionism, and depression in the development and/or maintenance of eating disorders and dysfunction warrant investigation.

Body Dissatisfaction
Past research has demonstrated a positive correlation between body dissatisfaction and maladaptive eating attitudes and behaviors (Cooley & Toray, 2001). More specifically, past research has found that college women who demonstrated high levels of body dissatisfaction tended to exhibit higher levels of concern about gaining weight and dieting, and reported more maladaptive eating attitudes and behaviors compared to those exhibiting lower levels of body dissatisfaction (Cooley & Toray, 2001). Interestingly, some research has reported that some groups of college women display particularly high rates of body dissatisfaction (Klemchuk et al., 1990), and others have reported overweight women displaying the most body weight dissatisfaction (Neighbors & Sobal, 2007). However, eating disorders such as anorexia nervosa or maladaptive eating behaviors such as restricting the amount of food consumed are often seen in women who are underweight or who have a normal weight. This has implied that other factors, in addition to body dissatisfaction, could lead a person to develop an eating disorder or eating dysfunction with symptoms such as restricting and/or purging. One factor is perfectionism.

Perfectionism
Research has found both direct and indirect relationships between perfectionism and eating disturbances. One study found that perfectionism positively correlated with eating disturbances (Chang, Ivezaj, Downey, Kashima, & Morady, 2007). Another study found a relationship between perfectionist tendencies and eating disorder symptoms only when the women in the study were overweight and endorsed low self-esteem (Vohs, Bardone, Joiner, Abramson, & Heatherton, 1999). Researchers have even found specific types of perfectionism to be predictive of specific problematic eating behaviors. Self-oriented perfectionism, a type of perfectionism in which an individual feels uneasy about making a mistake or doing something incorrect, was more predictive of anorexic symptoms (Vohs et al., 1999). Socially prescribed perfectionism, a type of perfectionism in which an individual feels they are expected by other people to meet certain standards, was predictive of bulimic symptoms (Welch, Miller, Ghaderi, & Vaillancourt, 2009). In short, past research has demonstrated that perfectionism represents a personality characteristic that is predictive of eating disturbances. Another factor related to eating disturbance is depressive symptoms.

Depression
Depressive symptoms are often comorbid with eating disorders. One study found that participants diagnosed with an eating disorder displayed clinical levels of depression, whereas participants with an eating dysfunction displayed mild levels of depressive symptoms, and those with no eating disorder or dysfunction displayed the lowest levels of depression (Gutzwiller et al., 2003). In addition, another study found that depression was a predictor of restricting attitudes regarding food, which is a predictor of restricting behaviors regarding food (Morris, Parra, & Stender, 2011).

An interesting relationship between depression and body dissatisfaction also exists. A study found that women who believed their body was bigger than it actually was were more likely to be depressed than women who accurately perceived their body weight (Harring, Montgomery, & Hardin, 2010). Further, overweight women with an accurate perception of their bodies were more likely to be depressed than overweight men with an accurate perception of their bodies (Harring et al., 2010). The fact that these women felt negatively about their bodies and displayed depressive symptoms put them at additional risk for engaging in maladaptive eating behaviors (Morris et al., 2011).

Past research has suggested that eating disorders and dysfunctions do not have a single causative explanation, but are rather the result of a multitude
of interacting factors. In short, when discussing eating disorders and dysfunctions, it is important to consider depressive symptoms, perfectionist tendencies, and body dissatisfaction because these factors seem to play a role in the development and maintenance of eating disorders and dysfunctions.

The purpose of the present study was to determine the levels of depressive symptoms, perfectionist tendencies, and body dissatisfaction in women with different levels of disordered eating. Participants were grouped based on their Body Mass Index (BMI) scores and scores on the Goldfarb Fear of Fat Scale (GFFS; Goldfarb, Dykens, & Gerrard, 1985). Participants were also grouped according to their score on the Eating Attitudes Test (EAT; Garner & Garfinkel, 1979), specifically into three categories (a) met criteria for an eating disorder, (b) met criteria for an eating dysfunction, or (c) exhibited normal eating behavior.

Method

Participants
Participants consisted of 89 women who were enrolled in a psychology class at a Northeastern university. Participants received course credit in exchange for their participation. The mean age of the participants was 20.37 years ($SD = 5.76$). Many participants identified as European American (89.90%; $n = 72$). African Americans comprised 7.9% of the sample ($n = 7$); 5.6% were Latina American ($n = 5$) and 5.6% described their ethnicity as either biracial or of another unlisted ethnicity ($n = 5$). Over half of the sample had a first-year class standing ($n = 49$), and 24.7% were sophomores ($n = 22$), 13.5% were juniors ($n = 12$), and 6.7% were seniors ($n = 6$). Table 1 lists the number and percentage of participants in each level of the three grouping variables.

Measures

GFFS. The GFFS is a scale that measures the fear of becoming fat (Goldfarb et al., 1985). The 10-item measure is answered using a scale of 1 (very untrue) to 4 (very true). Total scores range from 10 to 40, with higher scores indicating a greater fear of becoming fat (Goldfarb et al., 1985). Example items include “My biggest fear is of becoming fat,” “Becoming fat would be the worst thing that could happen to me,” and “I feel like all my energy goes into controlling my weight.” Goldfarb et al. (1985) found that women with a diagnosis of anorexia nervosa obtained an average score of 35.00 and a group of college women obtained an average score of 18.33 on the GFFS. Researchers found the measure to show high test-retest reliability and high internal consistency, with a Chronbach’s alpha of .85 (Goldfarb et al., 1985). The scale was able to successfully differentiate between women with anorexia nervosa and women with no eating disorder diagnosis (Goldfarb et al., 1985). For the current sample, the Chronbach’s alpha value was .81, reflecting adequate internal consistency.

EAT. The EAT is a test designed to measure behaviors and attitudes associated with anorexia nervosa (Garner & Garfinkel, 1979). The 40-item measure utilizes a Likert-type scale with possible responses ranging from 1 (always) to 6 (never). A total score can range from 40 to 240, and is derived from the sum of all items. Higher scores indicate more eating disordered symptoms. Example items include “find myself preoccupied with food,” “exercise strenuously to burn off calories,” and “have the impulse to vomit after meals.” Individuals who received a clinical diagnosis of anorexia nervosa scored higher than normal controls on the EAT, with anorexic patients obtaining a mean score of 58.90 and normal controls averaging 15.60 (Garner & Garfinkel, 1979). The EAT has shown excellent internal consistency, with an alpha of .94, and was found to display good predictive validity (Garner & Garfinkel, 1979). Chronbach’s alpha for the current sample was .84, reflecting good internal consistency.

| TABLE 1 |
| Group Membership for Each Level of Grouping Variables |
| Grouping Variable | % of Sample | n |
| Eating Dysfunction Level |
| Eating Disorder | 12 | 11 |
| Eating Dysfunction | 8 | 7 |
| Normal Eating Attitudes and Behavior | 80 | 71 |
| BMI |
| Underweight | 3 | 3 |
| Normal Weight | 61 | 54 |
| Overweight | 36 | 32 |
| GFFS Score |
| Low ($\leq 18$) | 27 | 24 |
| Medium (19–26) | 40 | 35 |
| High ($\geq 27$) | 31 | 28 |
| Missing Data | 2 | 2 |

Note: GFFS = Goldfarb Fear of Fat Scale; BMI = Body Mass Index.
Body Shape Questionnaire (BSQ). The BSQ is a scale used to assess concerns about body shape in women (Cooper, Taylor, Cooper, & Fairburn, 1987). The 34-item measure utilizes a Likert-type scale with possible responses ranging from 1 (never) to 6 (always). Total scores range from 34 to 204, with higher scores indicating more body dissatisfaction. Example items include “Have you been afraid that you might become fat (or fatter),” “Have you felt happiest about your shape when your stomach has been empty (e.g., in the morning),” and “Have you taken laxatives in order to feel thinner.” The measure was tested on women with and without an eating disorder. Women with an eating disorder scored higher than those without an eating disorder diagnosis (Cooper et al., 1987). Past research has found the BSQ to demonstrate high concurrent validity and moderate discriminant validity (Cooper et al., 1987). BSQ scores showed significant correlations between the total score of the Eating Attitudes Test and between the Body Dissatisfaction subtest of the Eating Disorder Inventory (Cooper et al., 1987). Chronbach’s alpha for the present study sample was .81, reflecting adequate internal consistency.

Frost Multidimensional Perfectionism Scale (FMPS). The FMPS is a self-report measure designed to measure several components of perfectionism (Frost, Marten, Lahart, & Rosenblate, 1990). The 35-item measure utilizes a Likert-type scale that ranges from 1 (strongly disagree) to 5 (strongly agree). Total scores range from 35 to 175, with higher scores indicating more perfectionistic tendencies. Example items include “If I fail at work/school, I am a failure as a person,” “I hate being less than best at things,” and “Neatness is very important to me.” Past research found the FMPS to demonstrate good reliability, with an alpha of .90 for the whole perfectionism scale (Frost et al., 1990). The FMPS also shows good concurrent validity, correlating significantly with other perfectionism measures (Frost et al., 1990). Chronbach’s alpha was .90 for the present sample, reflecting excellent internal consistency.

Center for Epidemiologic Studies-Depressed Mood Scale (CES-D). The CES-D is designed to measure depressive symptoms with a focus on depressed mood in the general population (Radloff, 1977). The 20-item measure is answered using a scale of 0 (rarely or none of the time) to 3 (most or all of the time). Total scores range from 0 to 60, with higher scores indicating more depressive symptoms. Example items include “I was bothered by things that usually don’t bother me,” “I had crying spells,” and “I felt sad.” The CES-D was found to have a high level of internal consistency in clinical samples, with alphas of .85 and .90 (Radloff, 1977). The measure also has good concurrent validity as it has correlated well with other scales that are used to measure depressive symptoms (Radloff, 1977). For this nonclinical sample, Chronbach’s alpha was .84, reflecting good internal consistency.

Procedure
The investigation was approved by the university’s institutional review board. Participants were tested in a college classroom. Participants were read a set of instructions and completed an informed consent form. A copy of the informed consent form was provided to participants. Participants then completed a demographics questionnaire and the measures in paper and pencil format. The order in which the measures were given was counterbalanced to manage demand characteristics.

Once all the data was collected, participants were grouped in two ways. First, scores on the GFFS were used to group participants as being low, medium, or high in their fear of becoming overweight. A subject was grouped as low if their score was at or below a score of 18, which placed them at or below the 25th percentile for the sample. A subject was grouped as high if their score was at or above a score of 27, which placed them at or above the 75th percentile for the sample. Subjects whose scores were in between the 25th and 75th percentile were grouped as medium. In addition, BMIs were calculated in order to place participants in one of three groups: underweight, normal weight, or overweight.

Participants were also grouped based on their score on the EAT. Any subject who obtained a total score of 31 or higher was classified as meeting criteria for an eating disorder. This cutoff score was recommended by the authors of the EAT to correctly identify women with severe eating problems (Garner & Garfinkel, 1979). The present study also aimed to examine those with eating dysfunctions. The average score for the control group used in creating the EAT was 15.6 with a standard deviation of approximately nine (Garner & Garfinkel, 1979). In the present study, participants with a total score of 24 through 30 were classified as exhibiting eating dysfunctions. These numbers were chosen because a score of 24 through 30 is above the average score by approximately one standard deviation, but below the cut-off score of
31 used in prior research to classify individuals as eating disordered. Once subjects were grouped appropriately, participants were then compared on the CES-D, the BSQ, and the FMPS.

**Results**

**Data Analysis Plan**

Participants were first grouped based on their scores on the EAT, and compared on their levels of depressive symptoms, body dissatisfaction, and perfectionistic tendencies utilizing one-way Analyses of Variance (ANOVA). These analyses were pursued in order to determine whether statistically significant differences emerged across factors predictive of clinical outcomes in eating disorder patients. Accordingly, we compared participants displaying normal eating attitudes and behaviors, those displaying signs of eating dysfunction but not to the degree consistent with a diagnosis of an eating disorder, and those exhibiting symptoms consistent with an eating disorder diagnosis.

Next, participants were grouped on their BMI and fear of dramatic weight gain, and a series of two-way ANOVAs were analyzed in order to determine whether specific levels of these hallmark symptoms of eating disorders, both individually and in tandem, predicted higher levels of depressive symptoms, body dissatisfaction, and perfectionistic tendencies. Of note, results presented below were grouped based on whether the analyses were run to predict depressive symptoms, body dissatisfaction levels, or perfectionistic tendencies.

**Depressive Symptoms**

Participants were grouped based on scores obtained on the EAT. Based on their score, participants were placed into one of three categories: meeting criteria for an eating disorder, meeting criteria for an eating dysfunction, or displaying normal eating attitudes and behaviors. Participants were then compared based on their scores from the CES-D. The means (and standard deviation) for each group were as follows: those meeting criteria for an eating disorder, $\overline{X} = 39.00$ ($SD = 10.15$); those meeting criteria for an eating dysfunction, $\overline{X} = 42.86$ ($SD = 13.91$); and those displaying normal eating attitudes and behaviors, $\overline{X} = 33.18$ ($SD = 9.84$). The average scores obtained for the groups meeting criteria for an eating disorder and those meeting criteria for an eating dysfunction were considerably higher than the average scores obtained across community samples (Radloff, 1977).

A one-way ANOVA was run to determine if a significant difference existed among groups. Mean scores on the CES-D did differ significantly across the three conditions, $F(2, 88) = 3.99, p = .022, \eta^2_p = .08$. Tukey post-hoc testing revealed that participants meeting criteria for an eating dysfunction scored significantly higher than participants displaying normal eating attitudes and behaviors on the CES-D (see Table 2).

Groups were then formed based on participants’ GFFS score and participants’ BMI. Participants were placed into a category of low, medium, or high depending on their score on the GFFS, with high scores indicating a greater fear of fat. Participants were also classified as either underweight, normal weight, or overweight based on their BMI. Participants were then compared on scores on the CES-D.

In examining the main effect for GFFS scores, the mean CES-D score for participants scoring in the low category of the GFFS was $30.75$ ($SD = 8.76$). The mean score for participants scoring in the medium category of the GFFS was $33.57$ ($SD = 10.51$). The mean score for participants scoring in the high category of the GFFS was $39.25$ ($SD = 10.57$). A two-way ANOVA was run to determine if significant differences existed among the groups. With alpha set at .05, a statistically significant main effect for GFFS scores emerged, $F(2, 87) = 3.64, p = .031, \eta^2_p = .084$. Participants in the high category based on the GFFS scored significantly higher on the CES-D than participants in the low category.

In examining the main effect for BMI, no significant differences were found among overweight, normal weight, and underweight women on the CES-D, $F(2, 87) = 0.05, p = .95, \eta^2_p = .001$. Further, no significant interaction effect was observed, $F(3, 87) = 2.35, p = .08, \eta^2_p = .082$.

**Body Dissatisfaction**

Participants were grouped based on scores obtained on the BSQ. Based on their score, participants were placed into one of three categories: meeting criteria for an eating disorder, meeting criteria for an eating dysfunction, or displaying normal eating attitudes and behaviors. Participants were then compared based on their scores from the BSQ. The means (and standard deviation) for each group were as follows: those meeting criteria for an eating disorder, $\overline{X} = 117.86$ ($SD = 25.05$); those meeting criteria for an eating dysfunction, $\overline{X} = 123.86$ ($SD = 26.34$); and those displaying normal eating attitudes and behaviors, $\overline{X} = 92.32$ ($SD = 33.60$). The average scores obtained for the groups meeting criteria for an eating disorder and those meeting criteria for an eating dysfunction were considerably higher than the average scores obtained across community samples (Radloff, 1977).

A one-way ANOVA was run to determine if a significant difference existed among groups. Mean scores on the BSQ did differ significantly across the three conditions, $F(2, 88) = 3.99, p = .001 . Further, \eta^2_p = .001$. Significant differences existed between groups, but not to the degree consistent with a diagnosis of an eating disorder, and those exhibiting symptoms consistent with an eating disorder diagnosis.

Next, participants were grouped on their BMI and fear of dramatic weight gain, and a series of two-way ANOVAs were analyzed in order to determine whether specific levels of these hallmark symptoms of eating disorders, both individually and in tandem, predicted higher levels of depressive symptoms, body dissatisfaction, and perfectionistic tendencies. Of note, results presented below were grouped based on whether the analyses were run to predict depressive symptoms, body dissatisfaction levels, or perfectionistic tendencies.

**TABLE 2**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Eating Disorder</th>
<th>Eating Dysfunction</th>
<th>None</th>
<th>p</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>CES-D</td>
<td>$39.00$ ($SD = 10.15$)</td>
<td>$42.86$ ($SD = 13.91$)</td>
<td>$33.18$ ($SD = 9.84$)</td>
<td>.022</td>
<td>.08</td>
</tr>
<tr>
<td>BSQ</td>
<td>$144.27$ ($SD = 38.46$)</td>
<td>$120.71$ ($SD = 26.34$)</td>
<td>$92.32$ ($SD = 33.60$)</td>
<td>.000</td>
<td>.23</td>
</tr>
<tr>
<td>FMPS</td>
<td>$108.55$ ($SD = 14.38$)</td>
<td>$117.86$ ($SD = 25.05$)</td>
<td>$107.08$ ($SD = 24.05$)</td>
<td>ns</td>
<td>–</td>
</tr>
</tbody>
</table>

Note. CES-D = Center for Epidemiologic Studies-Depressed Mood Scale; BSQ = Body Shape Questionnaire; FMPS = Frost Multidimensional Perfectionism Scale. *Significant differences existed between groups. **Significant differences existed between groups.
Levels of Disordered Eating | Graziano and Sikorski

on the EAT. Based on their score, participants were placed into one of three categories: meeting criteria for an eating disorder, meeting criteria for an eating dysfunction, or displaying normal eating attitudes and behaviors. Participants were then compared based on their scores from the BSQ. The means (and SDs) for each group were as follows: those classified as eating disordered, 144.27 (SD = 38.46); those classified as having an eating dysfunction, 120.71 (SD = 26.34); and those with normal eating attitudes and behaviors, 92.32 (SD = 33.60). A one-way ANOVA was run to determine if significant differences existed among groups. Mean scores on the BSQ did differ significantly across the three conditions, \( F(2, 88) = 12.58, p < .001, \eta^2_p = .23 \). Tukey post-hoc testing was used to determine where significant differences among the three groups in the population were present. These results revealed that participants classified as eating disordered scored significantly higher than participants with normal eating attitudes and behaviors on the BSQ (see Table 2).

Groups were formed based on participants’ GFFS score and participants’ BMI. Participants were placed into a category of low, medium, or high depending on their score on the GFFS, with high scores indicating a greater fear of fat. Participants were also classified as either underweight, normal weight, or overweight based on their BMI. Participants were then compared on scores on the BSQ.

In examining the main effect for GFFS scores, the mean BSQ score for participants scoring in the low category was 67.46 (SD = 21.92). The mean score for participants scoring in the medium category was 99.49 (SD = 26.75). The mean score for participants scoring in the high category was 131.36 (SD = 35.74). Compared to normative data from past studies, the mean scores for those displaying medium or high levels of fear of fat on the GFFS obtained scores that approximated the average obtained in clinical samples. A two-way ANOVA was run to determine if significant differences existed among the groups. With alpha set at .05, this difference was statistically significant, \( F(2, 87) = 22.57, p < .001, \eta^2_p = .36 \). Participants in the high category based on the GFFS obtained significantly higher scores on the BSQ compared to participants who were in the low or medium categories. Participants in the medium category scored significantly higher than participants in the low category.

In examining the main effect for BMI, no significant differences were found among overweight, normal weight, and underweight women on the BSQ, \( F(2, 87) = 2.44, p = .10, \eta^2_p = .058 \). Further, no significant interaction effect was observed, \( F(3, 87) = 1.62, p = .20, \eta^2_p = .058 \).

Perfectionistic Tendencies

Participants were grouped based on scores obtained on the EAT. Based on their score, participants were placed into one of three categories: meeting criteria for an eating disorder, meeting criteria for an eating dysfunction or displaying normal eating attitudes and behaviors. Participants were then compared based on their scores from the FMPS. A one-way ANOVA was run to determine if a significant difference existed among the groups. Mean scores on the FMPS did not differ significantly across the three conditions, \( F(2, 88) = 0.71, p = .495, \eta^2_p = .016 \) (see Table 2).

Groups were formed based on participants’ GFFS score and participants’ Body Mass Index (BMI). Participants were placed into a category of low, medium, or high depending on their score on the GFFS, with high scores indicating a greater fear of fat. Participants were also classified as either underweight, normal weight, or overweight based on their BMI. Participants were then compared on scores on the FMPS. A two-way ANOVA was run to determine if significant differences existed among groups. In examining the main effect for GFFS scores, no significant differences were found among women grouped as low, medium, or high on the GFFS when compared on the FMPS, \( F(2, 87) = 1.73, p = .184, \eta^2_p = .042 \). In examining the main effect for BMI, no significant differences were found among overweight, normal weight, and underweight women on the FMPS, \( F(2, 87) = 0.72, p = .491, \eta^2_p = .018 \). Further, no significant interaction effect was observed, \( F(3, 87) = 1.54, p = .211, \eta^2_p = .055 \).

Summary

The results of the present study suggested differences between college women with some degree of eating dysfunction and women with normal eating attitudes and behavior. Women classified as eating disordered reported significantly more body dissatisfaction than women with normal eating attitudes and behaviors. Further, women with higher levels of fear of becoming fat reported higher levels of body dissatisfaction than women with lesser fears of becoming fat. These results indicated a relationship between maladaptive eating attitudes and behavior and body dissatisfaction. Depressive symptoms were also related to eating attitudes and behavior.
Women who displayed symptoms of an eating dysfunction showed significantly more depressive symptoms than women with normal eating attitudes and behavior. Further, women with a high fear of becoming fat displayed more depressive symptoms than women with a low concern of becoming fat. This study also aimed to examine differences between women classified as eating disordered and as having an eating dysfunction. The lack of significant differences between women classified as having an eating disorder or eating dysfunction on any outcome measure used in this study indicated that women with an eating disorder or eating dysfunction show similar levels of body dissatisfaction, depressive symptoms, and perfectionistic tendencies. In short, the results suggested that women with an eating disorder and dysfunction share similar pathologies that might contribute to the development and/or maintenance of negative eating attitudes and behavior.

**Discussion**

Past research has found that women diagnosed with an eating disorder and women displaying symptoms of an eating dysfunction show high levels of body dissatisfaction, weight preoccupation, perfectionist tendencies, and maladaptive eating attitudes and behaviors (Garner et al., 1984; Klemchuk et al., 1990). The present study compared women with an eating disorder to women with an eating dysfunction on these factors, taking them into account simultaneously.

The present study revealed that women with some degree of maladaptive eating attitudes and behaviors reported higher levels of depressive symptoms and body dissatisfaction. Due to this finding, it is thought that depressive symptoms and body dissatisfaction play a role in the development and/or maintenance of maladaptive eating attitudes and behaviors. Eating disorders and dysfunctions can have a severe and damaging impact on a person’s life. Therefore, identifying factors that contribute to the development and/or maintenance of negative eating attitudes and behaviors is essential.

Although it is clear depressive symptoms do play a role in the development and/or maintenance of maladaptive eating attitudes and behaviors, it is unclear as to whether depression precedes or follows women engaging in negative eating behaviors. It might be that women who have high levels of concern about their body have a fear of gaining weight and tend to frequently think of ways to prevent weight gain. This frequent worry might inhibit women from engaging in positive social experiences. The social isolation and loneliness that follow might cause subsequent depressive symptoms. Another possibility is that women who have a persistent fear of gaining weight might put much of their efforts into worrying about and preventing weight gain, therefore neglecting potentially fulfilling activities. Women exhibiting depressive symptoms might even apply their negative thoughts to their body (Sides-Moore & Tochov, 2011). Because feelings of hopelessness and worthlessness often accompany depression (American Psychiatric Association, 2000), if a woman also feels dissatisfied with her body, she might feel hopeless about trying to improve her body to meet her subjective standards. Therefore, she might take extreme measures such as engaging in maladaptive eating behaviors in the hopes of improving her body satisfaction and lessening her feelings of hopelessness and worthlessness. In short, it is clear that depressive symptoms do play a role in women displaying maladaptive eating attitudes and behaviors, and represents a crucial symptom to assess in the treatment of eating disorders and dysfunctions in women.

The present study also found a significant difference in mean scores between fear of becoming fat and body dissatisfaction. This finding suggests that body dissatisfaction also plays a role in the development and/or maintenance of maladaptive eating attitudes and behaviors in women with an eating disorder or dysfunction. It is thought that body dissatisfaction acts as a precursor to women engaging in both eating disordered and dysfunctional behaviors such as purging, restricting food, or chronic dieting in the attempt to reduce feelings of dissatisfaction with one’s body (Cooley & Toray, 2001).

Results from the present study indicated that women with eating disorders and eating dysfunctions suffer from similar internalizing symptoms that can be contributing to their maladaptive eating behaviors. From this, it is thought that the diagnosis of eating disorders might need to change from a categorical disorder to one diagnosed on a dimension. After all, women who were classified as eating disordered did not differ significantly from women classified as exhibiting an eating dysfunction on a single outcome measure in the present study. This was an important finding because it supports the idea that women with eating dysfunctions show similar levels of maladaptive thoughts.
and behaviors as women classified as eating disordered. The artificial distinction between disorder and dysfunction requires further analysis.

Limitations
Sample characteristics might have limited the applicability of study results to the population of college women due to the sample consisting of mostly Whites and women of a first-year class standing. Further, the sample consisted of a small number of underweight women. It is thought that due to such a low number of underweight women characteristics and behaviors of underweight women might not have been adequately represented. However, the sample constituted actual college-aged women, meaning results could be indicative of actual eating attitudes and behaviors of college women.

Another possible limitation might have been the BMI classification system. Although BMI is easy to calculate and is widely used, BMI calculation does not take into account all factors necessary to place a person into the correct weight category such as muscle and bone mass (Department of Health and Human Services Center for Disease Control and Prevention, 2011).

Potential group placement problems also existed through the use of the EAT. Although the EAT was designed to measure behaviors and attitudes associated with anorexia nervosa, 45.5% of the women classified as eating disordered were overweight (n = 5). This was a serious limitation because it calls into question whether the EAT actually is able to differentiate among women with an eating disorder, dysfunction, or those who display normal eating attitudes and behaviors. It is thought that, in the present study, the EAT might have been assessing dieting behaviors or picking up on higher levels of body dissatisfaction. It is also possible that women in the overweight group were trying to lose weight and were engaging in weight loss behaviors that the EAT labeled as eating disordered.

In regard to BMI classification, women in the present study might not have reported their actual weight due to social desirability. It is also possible that women did not know their exact weight or height, which is necessary for calculating BMI. Due to body weight estimates being affected by social desirability factors, it is also possible women answered questions in a way to make themselves appear more health conscious or concerned about their weight than they actually were.

Future Directions
Due to the severity and negative effects of eating disorders and dysfunctions on women, further research in this area is necessary. Future research should look at personality characteristics that leave women at risk for developing an eating disorder or dysfunction. Doing so could add to knowledge on the types of personality characteristics and behavioral tendencies that are predictive of negative eating behaviors, and which need to be addressed in order to maximize treatment effects. For instance, although the present study did not find significant differences related to perfectionism, past research has found perfectionism to positively correlate with eating disturbance (Chang et al., 2007). Future research should examine the role of personality characteristics in the development and maintenance of eating disorders and dysfunctions. Past research has suggested that personality characteristics might have an indirect relationship with eating disturbance and might be moderated by factors such as stress (Cooley & Toray, 2001). A better understanding of the relationship between personality characteristics and maladaptive eating attitudes and behaviors might aid in the treatment of eating disorders and dysfunctions.

Researchers should also more closely examine the role of depression in eating disorders and dysfunctions. Research has been unclear as to whether depressive symptoms are a cause of maladaptive eating attitudes and behaviors or whether depressive symptoms are a result of eating disorders and dysfunctions. It is possible that the order may vary for each person, yet investigators should aim to uncover potential moderators of the relationship between depressive symptom onset and symptoms of eating disorders and dysfunctions.

Future research should also examine eating disorders and dysfunctions among individuals from different cultures and people of different sexes and ages. It might be that different cultures hold different body ideals. A culture that does not place a strong value on a thin body might have lower rates of eating disorders and dysfunctions, or cultures with different body ideals might differ on the types of eating disturbances exhibited. Research might also benefit from exploring age as a factor in eating disturbances. Much of the eating disorder research to date was conducted with high-school-aged and college-aged women. Examining how age influences eating disorder and dysfunction symptoms warrants investigation. Future research should also examine the role of biological sex
on eating disorders and dysfunctions. Although eating disorders are more common in women, men also experience eating disorders and dysfunctions (Hudson et al., 2007) and might present different symptomology.

Finally, future studies should continue to compare women with eating disorders to women with eating dysfunctions, with the hope of finding support to make eating disorder diagnoses dimensional rather than categorical. Rather than using a categorical system of classification such as women being classified as either having an eating disorder or not women could be assessed and treated on a continuum of severity. With a dimensional approach to eating disorders, varying degrees of severity could be better assessed, and women with varying degrees of symptomology could be treated. In short, by using a dimensional approach in classifying eating disorders, targeted treatments could be developed for individuals displaying differing levels of eating disorder severity.

Conclusion
The present study supported the idea that women with an eating dysfunction suffer from similar problems as women with an eating disorder. Women with an eating dysfunction show maladaptive eating attitudes and behaviors, but fail to meet the strict diagnostic criteria for an eating disorder. This might hinder their ability to receive the appropriate diagnosis and treatment for their problems. The DSM-5 (American Psychiatric Association, 2013) has addressed this issue by changing some of the diagnostic criteria for eating disorders. For example, a woman who showed all the symptoms of anorexia nervosa except amenorrhea was previously unable to receive an anorexia nervosa diagnosis. With the changes made in the DSM-5, women no longer have to experience amenorrhea to receive a diagnosis of anorexia nervosa. This change has allowed more people to receive an eating disorder diagnosis and therefore the appropriate treatment.

Past research has suggested that depression and body dissatisfaction play a role in eating disturbance. Results from the present study indicated that women with an eating disorder and dysfunction show similar levels of depression and body dissatisfaction. Whether body dissatisfaction and depressive symptoms are causative factors or the result of maladaptive eating attitudes and behaviors is unclear, and is an issue worthy of future investigation. Regardless, it is clear that women with some level of eating disturbance show higher levels of depression and body dissatisfaction than women with normal eating attitudes and behaviors. This finding implies that body dissatisfaction and depression play a role in the development and/or maintenance of eating disorders and dysfunctions. These two groups of women might need similar treatment interventions to address their maladaptive eating attitudes and behaviors. Further, women with an eating dysfunction should receive treatment to prevent their symptoms from developing into an eating disorder. Due to the similarities between women with an eating disorder and dysfunction, it is thought that a categorical approach for diagnosing eating disorders might not be the most effective in addressing and treating women with maladaptive eating attitudes and behaviors. It is thought that eating disorders would be better diagnosed on a continuum so that all severity levels of eating dysfunction can receive the appropriate level of treatment.

Eating disorders and dysfunctions are an important topic of study because of the severe impact an eating disturbance has on an individual’s life. Due to the negative effects of eating disorders and dysfunctions, women with all levels of eating dysfunction should receive a form of treatment to address their negative attitudes and behaviors regarding eating and their bodies. Understanding what factors contribute to the development and maintenance of maladaptive eating attitudes and behaviors is essential to treating eating disorders and dysfunctions.

References
of the symptoms of anorexia nervosa. Psychological Medicine, 9, 273–279. doi:10.1017/S0033291700030762

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Explanatory style is a personality variable referring to the habitual way in which individuals explain to themselves the cause of the negative events that befall them (Maier & Seligman, 1976). It spans three dimensions: internality, stability, and globality (Maier & Seligman, 1976). Individuals who typically make internal attributions ascribe the cause of the negative event to an internal factor. In contrast, individuals offering external attributions ascribe the cause to an external factor. A student failing an exam may make an internal attribution such as “I am stupid” or an external attribution such as “The exam was too hard.” Individuals who consistently make stable attributions believe that the cause of the negative event will last forever, whereas individuals offering unstable attributions expect this cause to be transient. A student who is on academic probation may make a stable attribution and believe that the factor responsible for this event will last forever or make an unstable attribution and regard this cause as temporary. Finally, individuals consistently offering global attributions believe that the negative event will impact other life areas, whereas individuals making specific attributions think that this event will be circumscribed. A student who drops out of college may make a global attribution and believe that the negative event will negatively impact his or her relationships, or make a specific attribution and think that the failure will not influence other life areas negatively (Maier & Seligman, 1976).

The choice of dimensions of explanatory style was theoretically driven and reflected the researchers’ questions of interest (Peterson, 1991). Explanatory style originated from the reformulated learned helplessness model and sought to explain why individuals responded in different ways to major, negative life events. Individuals who typically offered internal, stable, and global attributions for negative events were more likely to behave passively in the face of challenge, were poor at problem-solving, and eventually gave up. In contrast, individuals who offered external, unstable, and specific causal

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attributions to negative events were more likely to persist after failure and keep trying to excel (Maier & Seligman, 1976).

Rather than a typology, explanatory style can be represented on a continuum between pessimistic and optimistic explanatory style. Individuals should not be categorized as pessimistic or optimistic. Instead, one should regard them as more likely to have an optimistic or pessimistic explanatory style. Individuals with pessimistic explanatory style habitually make internal, stable, and global attributions for bad events. These individuals expect negative events to happen consistently and believe that they cannot exert control over these events. Individuals with pessimistic explanatory style are more likely to become helpless and passive in the face of obstacles and exhibit the “whatever will be will be” mentality. On the other hand, individuals with optimistic explanatory style consistently offer external, unstable, and specific causal attributions for bad events. Unlike individuals with pessimistic explanatory style, individuals with optimistic explanatory style typically possess a wider repertoire of responses to challenge. Instead of giving up in the face of challenge, optimists typically renew their efforts (Maier & Seligman, 1976).

Many studies have documented the relation between pessimistic explanatory style and depression, and have consistently found that individuals offering internal, stable, and global causal attributions for negative events were at a greater risk for depression (Metalsky, Abramson, Seligman, Semmel, & Peterson, 1982; Miller & Seligman, 1975). Fazio and Palm (1998) found a significant correlation between depression and explanatory style, and between depression and GPA. Besides depression, a large body of research has supported the relation between explanatory style and achievement in an academic context (Metalsky et al., 1982; Peterson & Barrett, 1987; Nolen-Hoeksema, Girgus, & Seligman, 1986). Specifically, Nolen-Hoeksema et al. (1986) demonstrated that, compared to schoolchildren with optimistic explanatory style, schoolchildren with pessimistic explanatory style showed higher depression levels and were more likely to experience achievement problems. Similarly, Metalsky et al. (1982) found that the more internal and global attributions university first-year students offered for negative events, the more severely depressed they became after the receipt of a low midterm-exam grade. Fazio and Palm (1998) found a significant correlation between depression and explanatory style, and between depression and GPA.

Although pessimistic explanatory style has been linked to low achievement performance in an academic context, there may be multiple definitions of academic performance. Thus, it seems reasonable to focus on a single aspect of academic performance such as GPA. Examining the relationship between explanatory style and GPA is important because the former may emerge as an unexpected predictor of and have important implications for the latter (Peterson & Barrett, 1987). Explanatory style may have a direct bearing on students’ approach toward studying. Students in any course typically encounter a number of difficulties throughout the semester, such as failing a quiz, coming unprepared to class, or not being able to solve a set of homework problems. It is important how students explain to themselves the causes of these events because this may affect their academic performance.

Individuals believe that internal factors are less likely to change than external factors (Metalsky et al., 1982). Thus, if a student thinks “I’m stupid,” the student is likely to give up and believe intelligence is not likely to change. External circumstances, on the other hand, are perceived as more mutable. If a student assigns the blame to an external factor, he or she is likely to keep trying to excel. Thus, students with optimistic explanatory style are expected to persist in the face of challenge and renew their efforts after a negative academic outcome (Peterson & Barrett, 1987). Students who eventually achieve a higher GPA are perhaps less likely to behave passively because they offer external attributions (“The professor gave a very hard exam”), unstable attributions (“It will be short-lived”), and specific attributions (“It will not affect the other areas of my life”). On the contrary, students who end up with a low GPA may be more likely to behave passively because they use internal (“I’m stupid”), stable (“It’s going to last forever”), and global (“It will undermine everything I do”) causal attributions for their academic failures. These students tend to be passive when they encounter obstacles and eventually give up (Peterson & Barrett, 1987). Yet, it must be noted that the relationship between attributional style and GPA seems to be moderated by different variables such as students’ ability level (Gibb, Zhu, Alloy, & Abramson, 2002; Houston, 1994), major (Satterfield, Monahan, & Seligman, 1997), and time of the semester (Yee, Pierce, Ptacek, & Modzelesky, 2003).
Peterson & Barrett (1987) examined the relation between explanatory style and academic performance in 87 university first-year students and found that first-year students with pessimistic explanatory style received lower grades during their first year and were more likely to show passivity in the face of challenge. These findings held true after the researchers controlled for confounding variables including initial depression, measured by the Beck Depression Inventory (Beck & Steer, 1984), and aptitude test scores, measured by the Scholastic Aptitude Test (Peterson & Barrett, 1987). Building on Peterson & Barrett’s (1987) study, we hypothesized that students with optimistic explanatory style who offered external, unstable, and specific attributions to negative academic outcomes would have a higher GPA than students with pessimistic explanatory style who offered internal, stable, and global attributions to negative academic situations.

Methods

Participants
Participants were 235 college students from a small liberal arts college and were at least 18 years old. Missing values necessitated the exclusion of 64 participants, leaving 171 participants for the final analyses. The major reason for this large exclusion was that participants received class credit for providing informed consent in the survey. As they could not be required to complete the whole survey because of ethical considerations, many of them answered only several questions and left the rest blank. The mean GPA was 3.16 (SD = 0.51) with a range of 1.72 to 4.00. There were 123 women (72%) and 48 men (28%). The majority of participants were 88 first-year students (51%), followed by 30 sophomores (18%), 21 juniors (12%), and 32 seniors (19%). Participants included both domestic (n = 158) and international students (n = 13).

Measures

Demographic questionnaire. Participants reported demographic information including sex, age, year in college, overall GPA, major, and whether they were a transfer or an international student. We did not collect ethnicity information because we believed that it was irrelevant to our major hypotheses.

Explanatory style. Participants completed the Academic Attributional Style Questionnaire (AASQ; Peterson & Barrett, 1987), which is patterned after the Attributional Style Questionnaire (ASQ; Cooligan, Offord, Malinchoc, Schulman & Seligman, 1994). The ASQ asked participants about various life events, mainly interpersonal situations (Cooligan et al., 1994), whereas the AASQ presented participants only with academic situations (Peterson & Barrett, 1987). Because the nonacademic items were irrelevant to academic outcomes, the AASQ included 12 hypothetical negative academic situations such as “You fail a final examination” (Peterson & Barrett, 1987).

In the original study, participants wrote short answers to the academic situations, after which trained evaluators rated participants’ answers on internality, stability, and globality (Peterson & Barrett, 1987). We altered the way the scale was administered because (a) our method was much less time-consuming, (b) participants provided their answers in a quantitative rather than a qualitative way, and (c) evaluator bias perhaps decreased. Participants rated the cause for each of the 12 academic events on the three dimensions of explanatory style: internality (“It’s me”) versus externality (“It’s somebody else”), stability (“It will last forever”) versus instability (“It will be short-lived”), and globality (“It will affect everything I do”) versus specificity (“It won’t affect anything I do”). The rating used a 7-point Likert scale, with low scores indicating optimistic explanatory style and high scores indicating pessimistic explanatory style. A sample survey item is the Appendix. For each participant, we obtained a composite score ranging from 1 to 7 by averaging participants’ scores across the dimensions of explanatory style and across the 12 negative academic situations (Peterson & Barrett, 1987).

Procedure

We obtained institutional review board approval prior to beginning the study. All participants signed an electronic informed consent before taking the survey. We employed several contact methods to recruit participants. First, college students received an e-mail with a link to the survey. Second, introduction to psychology students received credit for completing the survey. Third, students were availed of the survey through a link in the college announcement e-mail. All participants completed the survey electronically via LimeSurvey®.

Results

Our main hypothesis was supported. There was a significant correlation between explanatory
style and GPA (see Figure 1). However, this correlation was relatively small, \( r = -.15, p = .044 \). The correlation between internality \((M = 4.48, SD = 0.92)\) and GPA did not reach statistical significance, \( r = .008, p = .92 \). Stability \((M = 3.55, SD = 0.88)\), stability and globality \((M = 4.61, SD = 0.74)\), and globality \((M = 4.61, SD = 0.74)\), each correlated with GPA significantly. Regression analyses indicated that explanatory style and stability respectively accounted for 2.4% and 2.5% of the variance in GPA. Finally, a multiple regression was run using stability and globality as predictors and GPA as the criterion variable. We found a nonsignificant regression coefficient for stability, but a significant regression coefficient for globality, \( r = -.14, p = .027 \). Globality predicted 5.3% of the variance in GPA.

Discussion

Our main hypothesis was supported. There was a significant correlation between explanatory style and GPA. Students with optimistic explanatory style tended to have a higher GPA than students with pessimistic explanatory style. There seemed to be a significant, but small, relation between the habitual way in which students explained to themselves their negative academic outcomes and their GPA. This is perhaps because there are multiple other factors influencing one’s GPA such as parents’ level of education, socioeconomic status, IQ, personality traits, and abilities.

Two explanatory style dimensions, stability and globality, each correlated with GPA significantly. Stability, the extent to which individuals believe the factor causing the negative outcome will persist, significantly predicted GPA. This might be because students who believe that the factors causing academic negative events will persist become temporarily depressed and withdraw their efforts (Peterson & Barrett, 1987). It might also be that students’ pessimistic explanatory style negatively influences important life areas such as romantic relationships and friendships, which, in turn, negatively impacts GPA. Out of the three dimensions, globality had the largest predictive value for GPA. It seems that students believing that a failing grade would ruin other life areas become hopeless, withdraw their efforts and end up with a low GPA. Although globality seemed to be the best predictor of GPA out of the three dimensions, further research needs to replicate our findings.

However, the correlation between the third dimension of explanatory style, internality, and GPA did not reach statistical significance. This was a surprising finding because students with pessimistic explanatory style are expected to attribute the cause of the negative event to internal factors such as their character and abilities, as opposed to external factors such as other people or circumstances (Peterson & Barrett, 1987). Yet, our results did not support this assumption. Internality might have failed to reach statistical significance because students who offer internal attributions for negative academic events may take more responsibility, renew their efforts, and so achieve a higher GPA or because students may believe that internal factors and external factors are equally likely to change. Yet, these explanations violate a main assumption of learned helplessness theory (Maier & Seligman, 1976), and if they were true, we should have found a significant positive correlation between internality and GPA.

Another interesting finding was that stability was no longer significant when we simultaneously predicted GPA based on stability and globality. Stability might have been nonsignificant in the multiple regression because stability and globality were significantly correlated. Stability and globality correlate highly, perhaps because a factor has to last long enough in order to influence many life areas (Peterson, 1991).

Our results were consistent with Peterson & Barrett’s results (1987). We found a significant correlation between explanatory style and GPA. However, there were several important differences between the present study and Peterson & Barrett’s (1987) study. First, the correlation between explanatory style and GPA was smaller in the present study. Second, unlike Peterson and Barrett, we broke down explanatory style by its dimensions and examined their individual correlation with GPA. Third, our sample was larger (171 participants as opposed to 87) and slightly more diverse as it included international students and students from all four years in college. Fourth, Peterson and Barrett (1987) used measures that we did not administer: a questionnaire for the specificity of students’ goals, a self-efficacy questionnaire, a questionnaire about students’ typical coping response to academic failure, and the degree to which students made use of advising throughout the semester.

There were a number of limitations to the current study. First, we only analyzed participants’ self-ratings. Second, we altered the format of the AASQ because (a) reading such a large number of short answers was considerably time-consuming,
(b) participants provided their responses quantitatively rather than qualitatively, and (c) evaluator bias perhaps diminished. Third, the change of the scale might have compromised its internal validity because (a) it limited participants’ responses to a 7-point Likert scale instead of allowing participants to express subtler nuances of their responses, (b) social demand characteristics might have been active, and (c) participants might have been simply confused by the new wording of the situations.

Second, the external validity of our results was limited because our sample was not representative and because of a potential restriction of range issue (e.g., high average GPA). Third, social desirability characteristics might have been active. It was not possible to determine whether participants reported their GPAs accurately because we did not verify their GPAs with the college’s registrar. Participants might have also given more socially desirable responses on the AASQ. Fourth, because the present study used a correlational rather than an experimental design, the direction of causality is not clear. Explanatory style might have influenced GPA, GPA might have influenced explanatory style, or a third variable might have been responsible for both explanatory style and GPA.

Fifth, though many of our results were statistically significant, they were not necessarily practically significant. Although the typical correlation with explanatory style is in the range of .20 to .30 (Peterson, 1991), the size of our correlations was relatively small. Globality, the best predictor out of the three dimensions, explained only 5% of the variance in GPA, which means that 95% of the variance in GPA was explained by factors other than explanatory style. Alternative explanations could include participants’ cultural background, IQ, SAT scores, personal traits and abilities (e.g., persistence, motivation, time-management skills, goal-directedness), depression, major, sex, age, parental education, inaccuracy in reporting GPA, social demand characteristics, and others.

Sixth, it is not clear whether academic explanatory style is a legitimate construct by itself. Explanatory style in general may be a more strongly established psychological construct and may have a greater correlation with GPA than academic explanatory style. Academic attributional style is only an example of attributional style. It is restricted to academic situations only and may thus have a more limited general validity.

Our sample included many more women than men, and sex might have been a confounding variable. Second, explanatory style about academic events may be more strongly expressed in upper division than in first-year students. Students in their first year may not have fully formed their academic explanatory style yet, whereas upperclass students may be more familiar with the negative academic events in college. Third, individuals may offer “spontaneous” attributions to hypothetical events and do not necessarily think of the cause of the negative events that befall them unless explicitly asked (Peterson, 1991). Students might have ruminated on the cause of the negative academic events they encountered, but they might have found it difficult to determine the cause of hypothetical, imagined negative academic events. Fourth, there may be cultural differences in explanatory style (Peterson, 1991), and the international students in our sample might not have conformed to the typical pattern of explanatory style attributions. All of these variables could have acted as potential confounds and might have suppressed the correlation between explanatory style and GPA. Partialing out their variance could have revealed a greater correlation between explanatory style and GPA.

It seems that the relationship between explanatory style and GPA is more complex. Specifically, Gibb et al. (2002) found that students who had a lower ability level (indicated by lower SAT scores) and a pessimistic explanatory style (consisting of internal and stable attributions) had a lower GPA compared to students who had a high ability level (indicated by high SAT scores), suggesting that the correlation between attributional style and GPA is moderated by students’ ability level. Interestingly, globality was not at all related to academic performance (Gibb et al., 2002).

The expectation
that pessimistic attributional style is related to low academic performance and optimistic attributional style is related to high academic performance was violated by other studies as well. Houston (1994) found that students who perform well make stable and, to some extent, global attributions. Satterfield et al. (1997) demonstrated that law students with pessimistic explanatory style (consisting of stable, internal, and global attributions for negative events) had a higher GPA than law students with optimistic explanatory style. Further, Bridges (2001) indicated that SAT, but not attributional style, was significantly related to later performance on course-related objective exams in college. Finally, in a study by Yee et al. (2003), pessimistic explanatory style was not related to academic performance in the first part of the semester, but was positively correlated with it during the second half of the semester. All of these findings that differ from the general attributional style hypothesis underscore the importance of further examining the role of potential confounding variables in the relationship between explanatory style and GPA.

The numerous limitations of the present study point to a number of future research directions. Peterson and Barrett (1987) suggested that prevention programs be designed in order to target students in need of academic attribution therapy. Wilson and Linville (1982, 1985, as cited in Peterson & Barrett, 1987) found that interventions teaching students how to make more transient attributions helped students become more persistent and improved their grades in college. We suggest that colleges design prevention and intervention programs in order to target students with highly pessimistic explanatory style who are doing poorly academically. The programs’ sections on explanatory style should teach students that a low grade does not necessarily affect the other areas of their lives in a negative and long-lasting way. However, because the correlation between explanatory style and GPA is relatively small, the former should be a supplementary part of such programs rather than their primary topic.

Future researchers could examine the causal relation between explanatory style and GPA. Does the former cause the latter or vice versa, or does a third variable cause both? In order to increase external validity, one could diversify the sample by recruiting more participants from various cultural backgrounds, by recruiting more participants with a low GPA, and by randomly selecting participants from the student body. Future researchers could investigate the role of explanatory style at different school levels (e.g., elementary school, middle school, high school, college, and graduate school). One has to examine the development of academic explanatory style over time through longitudinal studies. Future researchers could study academic explanatory style for good events as well as for negative events. It is important to understand how students explain their academic success to themselves. Last but not least, future researchers could refine the existing academic explanatory style scale or develop a new one that serves solely the purposes of academic explanatory style.

References


Author Note. Viliyana Maleva, Kathryn Westcott, Mark McKellop, Mark McLaughlin, and Widman.
APPENDIX

Sample Survey Question Measuring Explanatory Style in Negative Academic Situations

<table>
<thead>
<tr>
<th>You fail a final examination.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>It's somebody/something else</td>
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<tr>
<td>It will be short-lived</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>It won't affect what I do</td>
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<td></td>
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<tr>
<td>It will affect everything I do</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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</tbody>
</table>

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Disparities exist in how sexual assault and domestic violence victims are perceived and treated (Ben-David & Schneider, 2005; Israel et al., 2009). One factor that affects perceptions and subsequent treatment is the victim’s gender role, with gender role conforming women, or women fitting traditional gender expectations (e.g., feminine, nurturing), receiving better treatment than gender role nonconforming women, or women not fitting traditional gender expectations (e.g., masculine, assertive; Marin & Guadagno, 1999; Viki & Abrams, 2002). To advance our understanding of this disparity, a second factor related to perceptions and treatment was examined, namely perceivers’ endorsement of benevolent sexism.

Hostile and Benevolent Sexism

The literature has identified two types of sexism that affect how women are perceived and treated: hostile and benevolent sexism (Glick & Fiske, 2001). Hostile sexism is directed at nontraditional women, and women who fulfill traditional roles elicit benevolent sexism (Glick, Diebold, Bailey-Werner, & Zhu, 1997). Hostile sexism is the belief that women are incompetent and inferior to men. Hostile sexists view women to be in competition with men and believe women are out to dominate men in the workplace and relationships. Hostile sexism often results in unequal treatment of women (Swim, Aikin, Hall, & Hunter, 1995). Such blatant sexism is less socially acceptable than subtle sexism among women and men, and less common in the United States, however, it is more endorsed by men internationally than women (Glick & Fiske, 2001).

The more prevalent form of sexism is benevolent sexism (Glick & Fiske, 1996, 2001). Benevolent sexism advocates placing women on pedestals to be “protected, supported, and adored” (Glick & Fiske, 2001, p. 109). Benevolent sexism is defined as a set of beliefs that are subjectively positive to the perceiver, seen as legitimate and not really sexism, even to the perpetrators themselves (Glick & Fiske, 2001).
& Fiske, 1996). Women themselves often endorse benevolent sexism and do not view it as problematic (Glick & Fiske, 1996). However, benevolent sexism is based on stereotypic and restricted roles of women and portrays women as weak and in need of men’s protection and care (Glick & Fiske, 1996). Despite the relatively positive evaluation of women, benevolent sexism is still rooted in the belief that women are subordinates of men, which has damaging consequences such as unequal career opportunities (Glick & Fiske, 1996). Viewing women as subordinate to men and in need of men’s protection provides justification for viewing women as incompetent, which perpetuates hostile sexism (Glick & Fiske, 1997). This symbiotic relationship between hostile and benevolent sexism is characterized as ambivalent sexism (see Glick & Fiske, 1996, 1997), where hostile sexism creates negative feelings toward nontraditional women, and benevolent sexism creates positive feelings toward traditional women (Glick et al., 1997).

As a set of beliefs, benevolent sexism serves as an ideology through which people can perceive, understand, and interpret the social world, particularly as it relates to gender. Benevolent sexism as an ideology also serves to explain or justify gender inequality such as the unequal distribution of social or material goods in society (Major, Kaiser, O’Brien, & McCoy, 2007). Thus benevolent sexism serves to justify hostile sexism, which explains why an unequal distribution of power between men and women exists (Glick & Fiske, 1996). When people who highly endorse a benevolent sexist ideology are presented with a woman who does not fit the profile of someone who needs to be “protected, supported, and adored” (Glick & Fiske, 1996, p. 491), the woman poses a threat to their ideology in that evidence against one’s worldview may suggest it is not valid (Major et al., 2007).

Perceptions of Gender Role Conformity
Consistent with theorizing on benevolent sexism, we argued that people who endorsed benevolent sexism would positively evaluate a gender role conforming woman target, but negatively evaluate a gender role conforming target. Several lines of research have found support for gender role conforming women receiving more positive overall evaluations and eliciting more positive personality ratings than gender role nonconforming women (Casad, 2007; Eagly & Steffen, 1984; Marin & Guadagno, 1999; Prentice & Carranza, 2002; Rudman, 1998; Rudman & Kilianski, 2000). Women who fulfill traditional gender roles, for example, by being feminine and becoming mothers, are perceived as having more positive personality traits such as being warm and highly likeable (Diekman & Goodfriend, 2006; Fiske, Cuddy, Glick, & Xu, 2002; Glick & Fiske, 1996). Hebl, King, Glick, Singletary, and Kazama (2007) studied the reactions to a pregnant woman versus nonpregnant woman in a nontraditional job applicant role or a traditional store customer role. The researchers found that employees showed more hostile behavior toward the pregnant job applicant, and more benevolent behavior such as touching toward the pregnant customer. Glick and colleagues (1997) have also shown that benevolent sexism predicted favorable feelings toward traditional women (e.g., homemakers). Other research showed that benevolent ideologies were related to a higher preference of traditional partners in both men and women respondents (Chen, Fiske, & Lee, 2009). According to Glick and Fiske (2001), benevolent sexism serves as a means for men to maintain a positive self-image as the caretaker of the women in their lives, and as a result women who seek power were perceived as “ungrateful shrews or harpies deserving of harsh treatment” (p. 111). It makes sense then that nontraditional women such as career women and women with masculine personalities (e.g., assertive, independent) are perceived as lacking warmth and being overbearing (Eagly & Karau, 2002; Fiske et al., 2002; Rudman, 1998). Given this literature on gender role conformity affecting perceptions of likeability and warmth, these measures are included in the present study.

Perceptions of Abuse Victims
Research on the perceptions and treatment of abuse victims has suggested that the victim’s gender role matters (Marin & Guadagno, 1999; Viki & Abrams, 2002). Viki and Abrams (2002) examined whether the victims’ behavior had an influence on participants’ reactions. The researchers had participants read about a woman who was raped after inviting a man into her house, and the victim was either described as a mother of three, or no information was provided. The mother of three was assigned more blame for her rape than the control, as she was seen as violating her gender role expectation of a mother by inviting a strange man into her home. Research by Marin and Guadagno (1999) found that a woman victim’s perceived femininity depended on how she labeled an aversive incident. When the woman victim labeled the incident as
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sexual harassment, she was blamed more and was ascribed fewer feminine traits than when that same incident was not labeled as sexual harassment. Because the traditional role for women is to remain passive, labeling and reporting an incident as sexual harassment is considered assertive, or a gender role violation (Diekman & Goodfriend, 2006). The mere act of labeling an incident as sexual harassment led to the perception that the victim was less trustworthy and less likeable.

Furthermore, research has shown that the ideologies and attitudes of the perceiver also matter. Viki and Abrams (2002) showed that high benevolent sexism acted as a moderator in assigning blame to a married mother who was raped in the context of committing adultery. Those who had high benevolent sexist beliefs rated the married mother, compared to a control target, with higher blame than those with low benevolent sexist beliefs. In another study, high sexist attitudes were correlated with more blame to sexual harassment victims, as well as higher tolerance of sexual harassment and sexual harassment proclivities (De Judicibus & McCabe, 2001). Other research showed that high benevolent sexism was correlated with more blame (Abrams, Viki, Masser, & Bohner, 2003). The researchers concluded that more blame was assigned when the participant showed higher benevolent sexism because they viewed the woman’s behavior as inappropriate. Abrams and colleagues (2003) also concluded that, although benevolent sexism was correlated with victim blame, high hostile sexism was related with rape proclivity.

The Present Study

The present study extended previous work by testing whether benevolent sexism moderated perceptions of women who conformed or violated gender role stereotypes in the context of domestic violence. Unlike the studies mentioned previously, our study explicit manipulated the gender role personality and characteristics of the victim to be gender conforming or nonconforming. Benevolent sexism was selected as the target ideology because, as mentioned previously, it was correlated with blame, although hostile sexism is correlated with proclivity toward violence. Previous research in this domain found that only benevolent sexism, and not hostile sexism, was a significant moderator of perceptions of rape victims (Viki & Abrams, 2002). In addition, research has documented that hostile and benevolent sexism operate separately and are mediated by different perceptions of the victim (Abrams et al., 2003). Because domestic violence, or spousal abuse victims, are generally characterized with weakness, dependence on their partner, and the need of protection (Heater, Walsh, & Sande, 2002), we focused on benevolent sexism in this study. We hypothesized that participants who endorsed benevolent sexism would rate a gender conforming victim more positively (more likeable, more positive overall impression, and more positive personality traits) than participants who did not endorse benevolent sexism. Further, participants who endorsed benevolent sexism would rate a gender nonconforming victim more negatively (less likeable, more negative overall impression, and more negative personality traits) than participants who did not endorse benevolent sexism.

Method

Participants

Participants were 231 college students who participated for course credit. There were 161 women (69.7%) and 70 men (30.3%). The mean age was 22.39 (SD = 3.96) with a range from 18 to 48. The racial and ethnic groups represented in the sample included 31.2% (n = 72) Asian Americans, 28.6% (n = 66) Latinos, 22.9% (n = 53) European Americans, 9.1% (n = 21) multiracial or other categories, 5.6% (n = 13) Middle Easterners, and 2.8% (n = 6) African Americans. The majority of participants (67.5%, n = 156) identified themselves as liberal (somewhat, moderately liberal, or very) and the remaining 32.5% (n = 75) identified themselves as conservative (somewhat, moderately conservative, or very). All but three participants answered all the manipulation check questions correctly, resulting in the sample of 231 participants for analyses. This study was conducted with the university’s institutional review board approval, and all participants provided informed consent.

Materials

Scenarios. The target person, named Karen Johnson, was described as a 35-year-old married mother of two children in both conditions. In the gender nonconforming condition, she was employed full time as a stockbroker and had stereotypically masculine hobbies (watching football and reading Forbes Magazine). The gender nonconforming target was described as assertive, intelligent, and capable. In the gender conforming condition, Karen was a stay-at-home mom who enjoyed stereotypically feminine hobbies (knitting...
and reading Good Housekeeping Magazine). She was described as being warm, friendly, and nurturing. In both scenarios, Karen’s husband was described as commonly coming home from work angry and getting violent with Karen. His behavior included yelling insults, swearing, and throwing things at the wall. To imply that Karen was hurt in these tirades, the scenario specified that she wore makeup and baggy clothing to cover her cuts and bruises.

**Manipulation check questions.** To ensure the participants attended to the manipulation, they were asked four questions pertaining to Karen: her hobbies, personality characteristics, profession, and her husband’s characteristics. The manipulation of gender role was tested by having participants rate the target on the items “femininity” and “masculinity” on a scale from 1 (low) to 10 (high). All but three participants answered all the manipulation check questions correctly.

**Benevolent sexism.** The 11-item Benevolent Sexism Scale (Glick & Fiske, 1996) was administered with a rating scale from 1 (strongly disagree) to 6 (strongly agree). Sample items included “A good woman should be set on a pedestal by her man” and “Women should be cherished and protected by men.” The scale had acceptable internal consistency (α = .89), which is consistent with prior studies (Glick et al., 1997; Glick & Fiske, 1996, 1997).

**Likeability.** A 6-item likeability measure (Fiske et al., 2002) was rated on a scale from 1 (not at all) to 6 (extremely). The items included statements assessing the target’s tolerance, warmth, sincerity, friendliness, trustworthiness, and well-intentions. The scale had adequate internal consistency (α = .78), which is consistent with previous studies (Fiske et al., 2002).

**Overall impression.** A 3-item measure of overall impression (Casad, 2007) was used. Two items asked participants to imagine that they were Karen’s neighbor, and to rate the likelihood that they would engage with Karen such as “How likely would you to befriend Karen?” using a rating scale, ranging from 1 (definitely not) to 6 (definitely). The third item was “What is your overall impression of Karen?” rated from 1 (very unfavorable) to 6 (very favorable). The items were converted to z scores, averaged, and had acceptable internal consistency (α = .82).

**Personality trait ratings.** A 7-item personality trait scale (Casad, 2007) was measured using a rating scale ranging from 1 (low) to 10 (high). Participants rated Karen on each of the following traits: creativity, interpersonal warmth, introversion (reversed scored), extraversion, emotional stability, openness to new ideas, and interpersonal skills. The measure had acceptable internal consistency (α = .75).

**Design**

The study was a 2 (gender role: conforming or nonconforming) x 2 (benevolent sexism: high or low) between subjects design. The dependent variables included the victim’s likeability, overall impression, and personality traits ratings.

**Procedure**

The study was administered online using Sona Systems survey software. Participants were presented with one of two study titles, which were presented in random order, and constituted random assignment to one of the two conditions. Participants read the scenario about Karen, a victim of domestic violence, who was described as either gender role conforming (e.g., feminine) or gender role nonconforming (e.g., masculine). They then completed a questionnaire measuring the target’s likeability, personality traits, impressions of the target, and participants’ benevolent sexism.

**Results**

To determine whether the descriptions of the targets in the scenarios were regarded by participants as gender conforming or nonconforming, a comparison of the ratings on the masculine and feminine items was made. The independent samples t test showed that the manipulation was effective. Participants rated the gender nonconforming target as more masculine (M = 4.65, SD = 2.20) than the gender conforming target (M = 2.57, SD = 1.71), t(229) = 7.93, p < .001, r² = .22, and the gender conforming target was rated more feminine (M = 7.24, SD = 2.20) than the gender nonconforming target (M = 5.72, SD = 2.28), t(229) = 5.14, p < .001, r² = .10.

To test the hypothesis that benevolent sexism moderated evaluations of the gender role conforming and gender role nonconforming targets, multiple hierarchical regression analyses were used. Regression was chosen, as opposed to ANOVA, in order to keep benevolent sexism as a continuous measure, instead of blocking participants into high and low groups, which reduces statistical power (Tabachnick & Fidell, 2000). The continuous independent variable, benevolent sexism, was centered in accordance with standard practice to reduce multicollinearity (Aiken & West, 1991).
dichotomous independent variable, gender role, was dummy coded as zero (conforming) and one (nonconforming). In the simple slopes analysis, the dummy variable was recoded to test the effect of gender role conformity at high (+1 SD) and low (-1 SD) levels of benevolent sexism (Aiken & West, 1991). The predicted mean values were calculated from the overall unstandardized regression formula (Dawson & Richter, 2006).

Benevolent Sexism
To determine adequate variation in benevolent sexism scores, descriptive statistics were computed. The full range of possible ratings was used, 1 (low) to 6 (high), with a mean of 3.51 (SD = 1.04). The means were nearly normally distributed with a slight (but not problematic; Tabachnick & Fidell, 2000) negative skew (-.34).

Likeability
There was a two-way interaction between target gender role and benevolent sexism for likeability, F(1, 227) = 3.66, p = .05, r² = .09 (see Table 1). The simple slopes analysis indicated that the gender conforming target was rated as more likeable by participants scoring higher on benevolent sexism (M = 5.06) than lower (M = 4.62), β = .32, t(227) = 3.55, p < .001, r² = .05 (see Figure 1). The ratings of the gender nonconforming target were not significantly different for participants high (M = 4.59) or low (M = 4.49) in benevolent sexism, β = .075, t(227) = .84, p = .40. These results supported the hypothesis that participants higher in benevolent sexism have more positive ratings of the gender conforming target than participants lower in benevolent sexism.

Overall Impression
There was a two-way interaction between target gender role and benevolent sexism for overall impression, F(1, 227) = 3.93, p = .049, r² = .04 (see Table 1). The simple slopes analysis indicated that the gender conforming target was rated more positively by participants scoring higher on benevolent sexism (M = 4.63) than lower (M = 4.26), β = .207, t(227) = 2.25, p = .025, r² = .02 (see Figure 2). The ratings of the gender nonconforming target were not significantly different for participants higher (M = 4.14) or lower (M = 4.24) in benevolent sexism, β = -.051, t(227) = -.56, p = .58. This finding supported the hypothesis that participants who endorsed benevolent sexism gave positive ratings to a victim who fit the stereotype of women as weak and in need of protection.

Personality Traits
There was a two-way interaction between target gender role and benevolent sexism for personality trait ratings, F(1, 227) = 15.19, p = .001, r² = .10 (see Table 1). The simple slopes analysis indicated that the gender conforming target was rated more positively by participants scoring higher on benevolent sexism (M = 6.48) than lower (M = 5.29), β = .430, t(227) = 4.83, p < .001, r² = .09 (see Figure 3). The ratings of the gender nonconforming target were not significantly different for participants higher (M = 5.49) or lower (M = 5.66) in benevolent sexism, β = -.062, t(227) = -.69, p = .49. These results were consistent with the hypothesis that participants higher in benevolent sexism gave more positive ratings to a gender role conforming victim compared to participants lower in benevolent sexism.

Discussion
The present study first hypothesized that participants who endorsed benevolent sexism would rate a gender conforming domestic violence victim more positively than participants who did not endorse benevolent sexism and second that participants who endorsed benevolent sexism would rate a gender nonconforming victim more negatively than participants who did not endorse negative sexism. Findings supported the first hypothesis that participants who endorsed a benevolent sexist...
ideology rated the gender conforming target more positively than participants who did not endorse a benevolent sexist ideology. These findings were consistent with previous research on benevolent sexism as a prescriptive gender role ideology, with more positive evaluations associated with women who conform to gender roles. Perceiving a woman as having feminine personality traits and hobbies was related to a potential confirmation for participants with a benevolent sexist worldview, that women are supposed to be feminine (Glick & Fiske, 2001).

The present study, however, failed to support the second hypothesis. Participants who endorsed benevolent sexism did not rate gender nonconforming victims more negatively than participants who did not endorse benevolent sexism. Two possible reasons for the unsupported hypothesis are discussed below: first, the hypothesis might have been incorrect; second, there might have been underlying methodological issues.

**Limitations and Future Directions**

First, it is important to consider that the hypothesis might have been unsupported simply because it was wrong. On a broader scale, the implications of an incorrect hypothesis are that benevolent sexism does not predict perceptions of gender nonconforming abuse victims. However, this is unlikely as the proposed hypothesis was supported by previous research. Specifically, previous studies have repeatedly shown a strong relationship between benevolent sexism and gender conformity (Chen et al., 2009; Glick et al., 1997). Furthermore, the means for ratings of overall impression and personality showed a nonsignificant pattern in the hypothesized direction that participants who endorsed benevolent sexism reported lower ratings of the gender nonconforming target than participants who did not endorse benevolent sexism, suggesting that the unsupported hypothesis is likely due to methodological errors, rather than incorrect hypothesizing.

One methodological issue to examine is that the target’s gender nonconformity was not strong enough to evoke a threat reaction. Although the gender nonconforming target was career oriented and independent, and therefore not stereotypically feminine, she might have confirmed the benevolent sexist ideology by being a victim and in need of help and protection. Thus, her status as a victim, albeit a masculine one, might not have been threatening.

Another methodological limitation includes the college age sample. Perhaps the sample of largely young liberal women played a role in the results. These young women might have shown a positivity bias toward a gender conforming woman, but not negativity toward a gender nonconforming woman.

A stronger manipulation of gender role nonconformity is needed to more thoroughly test the hypothesis that gender nonconforming victims elicit more negative evaluations from participants high in benevolent sexism. Further, inclusion of the hostile sexism measure would have allowed for the detection of more hostility toward the gender nonconforming victim. Perhaps participants who...
endorsed benevolent sexism also endorsed hostile sexism or were ambivalent sexists, as research has documented that hostile and benevolent sexism are correlated (Glick & Fiske, 1997; Viki & Abrams, 2002). This ambivalence may be an explanation for null results. Future research should also test whether such perceptions are prevalent among emergency responders and whether these perceptions affect treatment.

Conclusion
Taken together, the results supported the hypothesis that benevolent sexism predicts how perceivers evaluate individuals who conform to gender roles. Participants who endorsed a benevolent sexist ideology potentially perceived confirmation of their beliefs when faced with a gender role conforming domestic violence victim, which resulted in more positive ratings of the target than participants who did not endorse a benevolent sexist ideology. These findings showed that the gender role of a domestic violence victim affects college students’ perceptions of a woman victim, which may similarly affect emergency responders’ perceptions of a woman victim. A gender conforming victim may be perceived positively, particularly among benevolent sexists, because she fits the normative image of a domestic violence victim.

This study supported existing research that disparities exist in how domestic violence victims are perceived (Ben-David & Schneider, 2005; Israel et al., 2009). The victim’s gender role is one factor that affects perceptions, with gender role conforming victims receiving more positive perceptions and better treatment than gender role nonconforming women (Marin & Guadagno, 1999; Viki & Abrams, 2002). The present study extended this research to show that individuals with stronger endorsement of benevolent sexism were more likely to show this positivity bias than individuals with weaker endorsement of benevolent sexism. An abuse context is a relevant context to test the role of benevolent sexism because benevolent sexism perpetuates portrayals of women as weak and in need of men’s protection and care (Glick & Fiske, 1996).

If future research extends this study to a sample of service providers, researchers can better understand whether biased perceptions of abuse victims, coupled with perceivers’ own benevolent sexist views, affects victims’ treatment. Such research findings could inform training interventions for service providers and emergency responders, raising awareness of this bias, and correcting for it in the treatment of domestic violence victims. In sum, this study added confirmation to the literature that benevolent sexism serves as a lens through which individuals judge others, specifically that individuals who endorse a benevolent sexist ideology perceive gender conforming individuals more positively.

References
Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. Journal of Personality and...
Gender Conforming and Nonconforming Perceptions

Social Psychology, 82, 878–902. doi:10.1037/0022-3514.82.6.878
Prentice, D. A., & Carranza, E. (2002). What women and men should be, shouldn’t be, are allowed to be, and don’t have to be: The contents of prescriptive gender stereotypes. Psychology of Women Quarterly, 26, 269–281. doi:10.1111/1471-6402.101-1-00066

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Coworkers and Supervisors on Facebook? 
Effect of Workplace Friendship, Trust, and Sex
Yun Jiang, Jennifer L. Hughes, and Lexi Pulice-Farrow 
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ABSTRACT. Few studies have examined Facebook® users’ attitude toward Facebook friending with people from the workplace. The first part of the present study investigated whether Facebook users liked to become Facebook friends with coworkers and whether their decisions were affected by their perceived workplace friendship, trust toward coworkers, and sex. The second part of this study examined whether supervisors’ intention of friending subordinates on Facebook generated a feeling of inappropriateness and whether men and women differed in their perceptions. Data were collected through online surveys (N = 399, 74% women). Results showed that the majority of Facebook users liked to become Facebook friends with coworkers, \( \chi^2(3) = 106.69, p < .001 \). Those who perceived a higher level of workplace friendship reported less unwillingness to friend coworkers on Facebook, \( r(380) = -.30, p < .001, r^2 = .09 \). Even with high perceived workplace friendship, users still felt more comfortable friending highly trusted coworkers compared to moderately or lowly trusted coworkers on Facebook, \( F(2, 232) = 195.44, p < .001, \eta^2 = .63 \). Furthermore, although in general Facebook users felt it inappropriate for supervisors to send them friend requests, \( \chi^2(3) = 115.94, p < .001 \), women were more likely to view this friending intention as inappropriate than men, \( t(381) = 2.05, p = .039, d = .25 \). This study provided important implications about how understanding the factors that influence users’ attitude toward Facebook friending with coworkers and supervisors can benefit both individual career advancement and organizational outcomes.

Since its launch in 2004, Facebook has attracted hundreds of thousands of visitors worldwide. As of June 2012, Facebook had over 955 million active users, ranking first among all social networking websites (Carlson, 2012). The popularity and prevalence of this new networking platform has aroused the interest of many psychology researchers.

Previous studies have examined user characteristics, motivations for using Facebook, identity presentation, the role of Facebook in social interactions, as well as privacy and information disclosure (Wilson, Gosling, & Graham, 2012).

However, the majority of the literature has concentrated on the profile owners themselves (Back et al., 2010; Carpenter, 2012) and their Facebook connection with families, school friends, and current or past significant others (Darvell, Walsh, & White, 2011; Jacobsen & Forste, 2011), who tend to be more involved in their private sphere. Few studies have focused on users’ Facebook relationships with people from a more public sphere, the workplace, until the Yale Daily News reported that numerous employers have utilized Facebook to seek information about potential employees (Balakrishna, 2006). Moreover, although a growing
number of research articles have examined the association between individuals’ offline and online network (Park, Lee, & Kim, 2012), limited studies have explored the offline relationships with certain characteristics that tend to be maintained in virtual communities. Research has documented that networking, especially with people from the workplace, is becoming more and more important for career advancement (Forret, 1997). Maintaining connections with coworkers on Facebook can become a new strategy to facilitate relationship development and thus benefit a person’s career (Gerard, 2012). It would be helpful to know what elements increase the chance for people to become Facebook friends with their coworkers. In the first part of this study, we investigated whether Facebook users liked to become Facebook friends with their coworkers and whether their decisions were affected by three possible factors: their perceived workplace friendship, trust toward work friends, and sex.

In addition to coworkers, supervisors compose another important group in a career network. However, individuals may feel uncomfortable when supervisors want to become their Facebook friends because exposing their Facebook profiles to supervisors can bring risks to their employment. In the second part of our study, we examined whether subordinates felt it inappropriate for supervisors to want to become their Facebook friends and whether their decisions were affected by three possible factors: their perceived workplace friendship, trust toward work friends, and sex.

**Friending Coworkers on Facebook**

As part of their social network, coworkers play an important role in most employed individuals’ careers and lives. Shanock, Roch, and Mishra (2012) found that coworker support enhanced employees’ positive attitudes about their employers, increased their altruistic behavior, and improved their productivity at work. Warner (2012) showed coworkers to be an important source of support for employees’ work-family balance efforts: higher levels of perceived coworker support predicted lower levels of work-family conflicts. Coworker support was also found to alleviate turnover intentions (Karatepe, 2012), reduce stress (Sloan, 2012), and improve job satisfaction and work well-being (Riordan & Griffeth, 1995). These positive effects of coworkers encouraged us to expect that individuals would be very happy to friend coworkers on Facebook in order to maintain their friendships and benefit most from their support. Therefore, we first hypothesized that Facebook users in general would like to become Facebook friends with their coworkers. However, other factors could also influence whether a person wants to have coworkers as Facebook friends. We proposed that the perceived workplace friendship and trust toward coworkers were two factors that would affect employees’ decisions on friending coworkers on Facebook.

**Perceived workplace friendship.** Multiple studies have confirmed that the major motivation for people to use Facebook is to support existing relationships or keep in touch with friends (Joinson, 2008; Raacke & Bonds-Raacke, 2008; Tosun, 2012). People who are more relationally close are more likely to engage in Facebook communication (Ledbetter et al., 2011). In addition, a study examining relationships on the Internet, Whitty (2008) found that online connections depended on whether an individual anticipated a long- or short-term relationship with the other person. These findings suggested that, in general, friendships on Facebook come from real-life relationships, especially those that are intimate and expected to grow. The workplace, like other offline social environments, allows individuals to establish friendships with people encountered. Good friendships established at work are often expected to continue in other aspects of life including the Facebook community. However, if the friendships acquired are not satisfying, people may feel reluctant to maintain the relationships on private Facebook pages, as implied by previous studies (Ledbetter et al., 2011; Whitty, 2008).

On the other hand, people’s workplace and online friending (i.e., making friend requests and becoming friends with others in virtual communities like Facebook) behavior can be a function of both the organizational structure and their personalities. Riordan and Griffeth (1995) studied workplace friendship and found that the job structure itself including long hours and low or unfair pay could lead to low levels of perceived workplace friendship and could push close workplace friends apart. For example, if individuals received lower salaries than their good friends at work who were in comparable positions, their friendships would likely be influenced. Moreover, unpleasant work structures often result in high stress and low job satisfaction (Riordan & Griffeth, 1995), which tend to decrease communication among coworkers both offline and online.

In addition, previous research has suggested that personality plays a role in workplace and online friendships. Studies investigating the relationship
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between the Big Five personality factors and Facebook usage found that extraversion and openness increased social media use (Correa, Hinsley, & de Zúñiga, 2010) and the number of Facebook friends (Moore & McElroy, 2012). Meanwhile, Moore and McElroy (2012) found that extraverted people tended to approach and interact with others more easily and intensively. Besides the Big Five factors, Sheldon (2008) also examined people who were unwilling to communicate offline. Instead of being more active in an online community, people who are fearful of communication offline tend to be quiet and have fewer friends online as well. Furthermore, Zywica and Danowski (2008) have established that the Rich Get Richer hypothesis, which states that people who are popular offline are more active online, received more empirical support than the Poor Get Richer hypothesis, which states that individuals who are unpopular offline are more active online. Therefore, introversion and shyness could result in both lower levels of friendship in real life and fewer friends on Facebook. These findings have indicated that both organizational (e.g., unfair pay) and personality (e.g., introversion) factors may result in individuals perceiving less workplace friendship and having fewer friends from work on Facebook at the same time. Accordingly, we conjectured the second hypothesis of our study: Facebook users who perceive less workplace friendship would report not wanting to have Facebook friends from work. This hypothesis can be viewed as an extension of Zywica and Danowski’s (2008) Rich Get Richer hypothesis.

Trust toward coworkers. Although workplace relationships share similar characteristics with relationships formed under other circumstances, they are more complicated because they are directly related to work, where supervisors have the potential to terminate one’s employment. Therefore, when people decide whether to include coworkers in their more private Facebook network, they may take into account elements other than merely friendship. Research has demonstrated that social surveillance is another major motivation of Facebook usage (Joinson, 2008), which suggests that coworkers in one’s Facebook network could engage in surveillance behavior and report any negative messages posted to the supervisor. In fact, Christofides, Muise, and Desmarais (2009) studied information disclosure and control on Facebook, and found that 76% of the participants reported the ability to control who sees their information on Facebook is important. Moreover, further research found that the negative messages Facebook friends posted on a person’s wall would reduce that person’s social attractiveness and credibility (Walther, Van Der Heide, Kim, Westerman, & Tong, 2008). Some coworkers may not only conduct surveillance but also post negative messages on their colleagues’ Facebook sites. Consequently, individuals are likely to only friend-request coworkers who they trust most on Facebook, even though they have experienced a high level of workplace friendship. Taking these findings together, we developed the third hypothesis: Facebook users who perceive a high level of workplace friendship are more willing to have work friends they highly trust as compared to those they moderately or lowly trust on Facebook.

Sex differences. The effect of sex should not be overlooked. However, the results from the limited amount of existing literature on sex differences in workplace friendship and Facebook usage posed some challenges in generating hypotheses about sex differences in the relationships between the variables in our study. Winstead (1986) and Aukett, Ritchie, and Mill (1988) found that women tended to have more intimate friends and place more importance on friends than men. In this regard, women would be more likely to friend coworkers on Facebook than men when they perceive a high level of workplace friendship. Nevertheless, in a research study about sex differences in perception of benefits from workplace friendship, Morrison (2009) found that women tended to perceive the benefits as social and emotional support and men tended to perceive it as having functional and career-related benefits. Given that friending coworkers on Facebook provides a good opportunity to strengthen the connections with them and increase career-related benefits, men are also likely to become Facebook friends with coworkers when they perceive a high level of workplace friendship. In addition, women were found to have more privacy concerns and were more likely than men to set their online profiles to private (Fogel & Nehmad, 2009; Raacke & Bonds-Raacke, 2008). Because of their higher privacy consciousness, women were more inclined than men to friend coworkers they trust most on Facebook. However, as a result of men’s focus on career-related benefits, they also tend to friend coworkers who they believe will help them. Therefore, men and women are likely to place an equal amount of emphasis on trust levels toward coworkers in their Facebook friending decisions. Consequently, trust is valued in all types of relationships by individuals, regardless
of whether they are women or men. In this study, we examined sex differences within each of our first three hypotheses, but because friendship and trust tend to be important for both women and men in deciding whether to friend coworkers on Facebook, we expected no significant sex effect on these relationships.

**Facebook Friend Requests From Supervisors**

Compared to coworkers, the decision of whether to add supervisors as Facebook friends is more complicated. Having supervisors as friends on Facebook provides opportunities to build a stronger personal connection, which can be beneficial to one’s career development. Conversely, it brings about a larger risk of losing jobs because supervisors could easily notice when an employee posts inappropriate information. Employees may feel more insecure about their jobs when supervisors become their Facebook friends. This sense of job insecurity tends to increase if supervisors initiate the friend requests because employees are likely to think that supervisors want to monitor them even if supervisors just want to strengthen their relationships. Research has provided evidence that job insecurity is associated with increased turnover intentions and worse well-being (Stiglbauer, Selenko, Batinic, & Jodlbauer, 2012). To avoid these potential misunderstandings and negative effects, it is important to understand how employees perceive supervisors when supervisors initiate friend requests on Facebook. In the second part of our study, we investigated whether individuals felt it inappropriate for supervisors to want to become their Facebook friends and whether there were sex differences in this perception of inappropriateness.

When supervisors initiate Facebook friend requests, we speculated that subordinates tended to believe supervisors want to monitor their behavior rather than to maintain or improve relationships. Moreover, having supervisors as their Facebook friends may diminish employees’ freedom and force them to be more disciplined and restrained on the site. Therefore, we developed our fourth hypothesis that Facebook users in general would feel it inappropriate for supervisors to want to become their Facebook friends.

With respect to the perception of supervisors’ Facebook friend requests, we expected strong sex differences. Morrison (2009) examined the sex differences in the perceived benefits from workplace friendship and found that men focused more on the career-related benefits than women. Research examining sex differences in Facebook usage showed that women focused more on self-presentation and relationship maintenance when using social networking sites (SNS), and men concentrated more on task-focused activities and forming new friendships (Haferkamp, Eimler, Papadakis, & Kruck, 2012; Muscanell & Guadagno, 2012). In addition, significantly more women than men reported feeling closer to Facebook friends than friends they see every day and that Facebook helps them express feelings more easily (Thompson & Lougheed, 2012). Thus women may be more reluctant to have supervisors as Facebook friends because supervisors prevent them from disclosing fully on Facebook.

The general personality differences between men and women may affect their perceptions of the Facebook friend requests from supervisors. Hamburger and Ben-Artzi (2000) found that women using social functions of the Internet displayed higher levels of introversion and neuroticism. Because of this, women may feel less comfortable than men having supervisors as Facebook friends. Interestingly, in a study with college students, the researchers found sex differences in attitudes toward accepting university faculty as Facebook friends. Hewitt and Forte (2006) reported that men were twice as likely as women to feel comfortable about faculty presence on Facebook. Other reasons that could cause this higher level of discomfort among female employees are the historical underrepresentation of women at work and the frequency of sexual harassments from supervisors (Lafontaine & Tredeau, 1986; McLaughlin, Uggen, & Blackstone, 2012). The historical underrepresentation of professional women leads women to have less confidence and perceive larger power differentials at work. The frequent news on sexual harassments occurring between supervisors and female subordinates generates more tension and caution among women. Statistics from the U.S. Equal Employment Opportunity Commission (USEEOC, 2013) indicated that, in 2011, there were 11,364 sexual harassment charges in total; 83.7% of them were filed by women. According to a 2008 telephone poll by Louis Harris and Associates of 782 female and male U.S. workers, 43% of the female employees who had been harassed were harassed by a supervisor (Sexual harassment in the workplace, 2009). In line with these studies, we devised the fifth hypothesis: women, as compared to men, are more likely to feel it inappropriate for a supervisor at work to want...
to be their Facebook friend.

Method

Participants

Three hundred ninety-nine participants were in the current study, and the sample consisted of 102 (26%) men and 297 (74%) women. All participants were 18- to 30-year-old (M = 22.73, SD = 3.17) Facebook users living in the United States, who held a part-time (46%) or full-time job (54%). Of the 399 participants, 65% identified themselves as White, 8% Black, 9% Hispanic, 9% Asian, and the remaining 9% as multiracial or other. Sixty percent of the participants were currently enrolled in college, and 15% had a master’s degree or higher. The majority of the participants used Facebook multiple times a day (71%) and had been using Facebook for more than 3 years (76%). On average, each participant had 496 friends on Facebook.

Measures

Workplace friendship. Respondents’ perceptions of workplace friendship were assessed by the 12-item scale developed by Nielsen, Jex, and Adams (2000). Example items included “I have the opportunity to get to know my coworkers,” “I have developed good friendships at work,” and “One of the reasons for working is to see these coworkers.” We used a 5-point Likert-type scale from strongly disagree to strongly agree to measure the responses. The last item, which stated “I don’t believe anyone who works with me is a true friend,” was reversed. We calculated a total score for each individual. Total scores can range from 12 to 60. Higher total scores indicated greater perceived workplace friendship. The internal consistency coefficient was adequate (α = .92).

Trust. Participants were asked to indicate how likely they were to become Facebook friends with coworkers for whom they had low, moderate, or high levels of trust. Five-point Likert-type scales from not at all likely to very likely were coded as 1 to 5. The higher the score, the more likely participants would friend coworkers with whom they had the corresponding trust level on Facebook.

Attitude toward coworkers and perception of supervisors. Participants were also asked to respond to two questions. First, “Would you rather not have coworkers as friends on Facebook?” Second, “Do you feel that it is appropriate for a supervisor to want to be friends on Facebook?” A 4-point Likert-type scale was used for each of the questions ranging from not true at all/not appropriate to very true/very appropriate, thus a higher score indicated less willingness to have coworkers as Facebook friends and a greater feeling of appropriateness toward supervisors wanting to become Facebook friends. We used 4-point scales here in order to avoid the selection of neutral.

Procedure

Upon approval from the college’s institutional review board, we administered the questionnaire using an online survey program (i.e., SurveyMonkey®). We created a separate secure link asking for participants’ e-mail addresses which would be used for prize notification. Twenty-eight research assistants recruited individuals through personal connections, e-mail flyers, and social media. To be considered for the study, individuals had to be 18 to 30 years old, live in the United States, have Facebook accounts, and have access to the Internet. Power analysis demonstrated that the sample size needed for this study was 100 (Murphy & Myors, 1998). Each participant received a website link to the survey and a secure link asking for their e-mail addresses. Participants were asked to complete the survey online.

In the surveys, we asked about demographic information. Participation was voluntary, but those who participated were entered into a drawing to win a $50 Amazon® gift card. This project was part of a larger project completed by an undergraduate research class investigating Facebook.

Results

We first investigated participants’ attitudes toward friending coworkers on Facebook. A chi-squared goodness of fit test was calculated to compare the frequency of each type of response to the question “Would you rather not have coworkers as friends on Facebook?” including not true at all, mildly true, somewhat true, and very true. A null hypothesis that each of the four responses would occur an equal number of times (25%) was set (Greenwood & Nikulin, 1996). Significant deviation from the hypothesized value was found, χ²(3) = 106.69, p < .001. Among the 385 participants who responded to the question, 168 (44%) selected not true at all, 116 (30%) selected mildly true, 67 (17%) chose somewhat true, and only 34 (9%) chose very true, indicating that the majority of participants would like to become Facebook friends with coworkers. Our first hypothesis was supported. We also conducted a chi-squared test of independence to compare men’s and women’s responses. No
A significant relationship was found, $\chi^2(3) = 2.26$, $p = .52$, which suggested that participants’ sex did not influence their attitudes toward friending coworkers on Facebook.

To test the second hypothesis, that Facebook users who perceived less workplace friendship were more likely to be unwilling to have Facebook friends from work, a Pearson correlation coefficient was calculated between participants’ scores of perceived workplace friendship and their scores of not wanting to have coworkers as Facebook friends. A significant, medium-sized (Cohen, 1988), and negative correlation was found, $r(380) = -.30$, $p < .001$, $R^2 = .09$. Therefore, the second hypothesis was supported. In addition, we performed a Pearson correlation analysis for men and women respectively to examine if there were sex differences in this correlation. For both groups, we found a significant, medium-sized, and negative correlation; $r(94) = -.32$, $p = .002$, $R^2 = .10$, for men and $r(284) = -.29$, $p < .001$, $R^2 = .08$ for women. This result indicated that both male and female participants with greater perceived workplace friendships were more likely to want coworkers to become their Facebook friends. A complete result regarding this hypothesis was shown in Table 1.

For the third hypothesis, that Facebook users who perceived high workplace friendship would be more comfortable friending coworkers with whom they had high levels of trust than those with whom they had low or moderate levels of trust on Facebook, the participants were grouped into one of three categories (high, medium, or low) on the basis of their perceived workplace friendship total scores. The grouping was determined according to the 33rd and 67th percentiles so that we could have three relatively evenly distributed groups. Participants with scores below the 33rd percentile (total score of 43), between 33rd and 67th percentiles (total score between 43 and 49, inclusive), and above the 67th percentile (total score of 49) were considered to have low, medium, and high perceived workplace friendship respectively. To test this hypothesis, only the 119 participants with high perceived workplace friendship were examined. A repeated-measures Analysis of Variance (ANOVA) was conducted to compare the participants’ scores of comfortableness with friending coworkers with whom they had low, moderate, and high levels of trust on Facebook. A significant effect of participants’ trust levels toward coworkers was found, $F(2, 232) = 195.44$, $p < .001$, $\eta^2 = .63$, which represented a large effect size (Tatsuoka, 1993) for trust for coworkers. Follow-up paired-samples $t$ tests revealed that participants with high perceived workplace friendship felt significantly more comfortable with friending highly trusted coworkers than moderately trusted, $t(116) = -10.14$, $p < .001$, $d = .94$, and lowly trusted coworkers, $t(116) = -16.70$, $p < .001$, $d = 1.54$, which indicated that the third hypothesis was also supported.

To examine if sex differences existed, we conducted a 3 x 2 mixed-design ANOVA, which tested the effects of both the trust levels (high, moderate, and low) and sex (men and women). No significant trust levels x sex interaction was present, $F(2, 230) = 0.63$, $p = .53$, $\eta^2 = .01$, and the main effect for sex was not significant, $F(1, 115) = 0.69$, $p = .41$, $\eta^2 = .01$. However, the main effect for trust levels was significant, $F(2, 230) = 154.83$, $p < .001$, $\eta^2 = .57$. In order to better understand the effect of trust levels, we also examined the 126 participants who perceived a low level of workplace friendship and the 138 participants who perceived a medium level of workplace friendship.

We performed two repeated-measures ANOVAs and found a significant effect of trust levels for both groups: $F(2, 248) = 92.66$, $p < .001$, $\eta^2 = .43$ for the low-level group and $F(2, 272) = 187.08$, $p < .001$, $\eta^2 = .58$ for the medium-level group. Follow-up paired-samples $t$ tests revealed that participants in the low-level group liked to become friends with highly trusted coworkers more than moderately trusted, $t(124) = -8.34$, $p < .001$, $d = .75$, and lowly trusted coworkers, $t(124) = -10.76$, $p < .001$, $d = .96$, and participants in the medium-level group also preferred highly trusted coworkers to moderately trusted, $t(136) = -10.47$, $p < .001$, $d = .89$, and lowly trusted coworkers as Facebook friends, $t(136) = -15.82$, $p < .001$, $d = 1.55$. The means and standard deviations of participants’ scores were displayed in Table 2. A 3

![Table 1](image-url)
x 2 mixed-design ANOVA was also conducted for each group to examine the sex effect. No significant main effect for sex was found for either group: $F(1, 123) = 0.31, p = .58, \eta^2 = .00$ for the low-level group and $F(1, 135) = 2.72, p = .10, \eta^2 = .02$ for the medium-level group, and no significant interaction was found for the low-level group, $F(2, 246) = 1.61, p = .20, \eta^2 = .01$. A significant trust levels x sex interaction was found for the medium-level group, $F(2, 270) = 4.09, p = .018$, but the effect size was small, $\eta^2 = .03$. Furthermore, the effect of trust levels was significant for both groups: $F(2, 246) = 55.85, p < .001, \eta^2 = .31$ for the low-level group and $F(2, 270) = 119.89, p < .001, \eta^2 = .47$ for the medium-level group. Therefore, for all employed individuals, regardless of sex and perceived workplace friendship, highly trusted coworkers were more likely to become their Facebook friends than moderately trusted and lowly trusted coworkers.

In the second part of this study, we examined participants’ perception of supervisors’ Facebook friending. We performed a chi-squared goodness of fit test again to compare the frequency of each type of responses to the question “Do you feel that it is appropriate for a supervisor to want to be friends on Facebook?” including not appropriate, somewhat appropriate, appropriate, and very appropriate. With the null hypothesis that each of the four responses would occur an equal number of times (25%), we found a significant difference between the observed and hypothesized values, $\chi^2(3) = 115.94, p < .001$. Among the 383 participants who responded to this question, 152 (40%) selected somewhat appropriate, 133 (35%) selected not appropriate, 82 (21%) chose appropriate, and only 16 (4%) chose very appropriate. This result suggested that most people feel uncomfortable when supervisors want to be their Facebook friends. Our fourth hypothesis was supported. A chi-squared test of independence was also calculated to examine the sex differences. We found a significant result, $\chi^2(3) = 7.80, p = .05$. Major differences appeared in the responses of not appropriate and appropriate. Thirty-eight percent of women and 26% of men selected not appropriate, and 18% of women and 31% of men chose appropriate, indicating that men generally would feel more comfortable with supervisors’ friend requests.

An independent-samples $t$-test comparing the mean scores of female and male participants’ feelings toward supervisors wanting to become their Facebook friends was performed. This was used to test the fifth hypothesis that women, as compared to men, were less likely to feel it was appropriate for supervisors at work to want to become their Facebook friends. The result showed there was a significance effect for sex, $t(381) = 2.05, p = .04$, although the effect size ($d = .25$) was relatively small (Cohen, 1992). Women $(M = 1.90, SD = 0.86)$ were significantly more likely to feel it inappropriate for supervisors to want to become their Facebook friends than men $(M = 2.11, SD = 0.83)$. Therefore, the fifth hypothesis was supported.

### Discussion

All of the five hypotheses in this study were supported. In general, Facebook users liked to friend coworkers on Facebook but tended to feel it inappropriate for supervisors to want to do the same. The perceived workplace friendship and trust toward coworkers had a significant effect on people’s decision about whether to be Facebook friends with coworkers, although no sex differences were found. People who perceived a higher level of workplace friendship were more likely to have coworkers as their Facebook friends. Among those who perceived a high level of workplace friendship, highly trusted coworkers allowed them to feel more comfortable to become Facebook friends with than moderately and lowly trusted coworkers. This relationship held for people who perceived a low and medium level of workplace friendship as well. Sex differences appeared in the feeling of inappropriateness toward supervisors’ Facebook friending invitations. When supervisors wanted to become Facebook friends with subordinates, female employees were more likely to feel it was inappropriate than male employees.

The results of our study reflected and confirmed findings from previous research on Facebook. For example, our result that those who perceived higher workplace friendship offline were more likely to have coworkers as their Facebook friends provided more evidence for the Rich Get Richer hypothesis (Zywica & Danowski, 2008) and

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<td><strong>Participant Characteristics (3rd Hypothesis)</strong></td>
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<td><strong>Workplace Friendship</strong></td>
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<td>Trust Level</td>
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indicated the phenomenon that individuals who are people-oriented offline tend to be more active online may also be observed in the workplace. In addition, the significant role that trust has played in Facebook friending coworkers, as established in this study, was consistent with the finding of Christofides et al. (2009), which stated that Facebook users did not want certain people to view the information on their private profiles.

Furthermore, the sex differences found in the perception of inappropriateness on supervisors’ Facebook friending requests confirmed our theoretical conjecture that the historical under-representation of women in the workplace results in women perceiving larger power differentials at work, and the potential threat of sexual harassment renders women to have more concerns when supervisors want to become their Facebook friends. However, the lack of sex differences in the relationships between Facebook users’ perceived workplace friendship, trust toward coworkers, and their willingness to friend coworkers implies that the Rich Get Richer hypothesis (Zywica & Danowski, 2008) applies for both women and men in the workplace. Trust-worthy friendships appear to be valued by every individual in all types of contexts including virtual communities such as Facebook.

Important implications can be drawn from the current research. Currently, networking and connections are becoming ever more important for career development. Within a person’s network, current or past coworkers and supervisors play a significant role for this function. Research has showed that Facebook acts as an extension of face-to-face interaction and can facilitate the social networking process (Kujath, 2011). Therefore, becoming a member in coworkers’ or supervisors’ Facebook friend lists can potentially improve relationships with them and bring about unexpected advantages. To increase the chance of becoming coworkers’ or supervisors’ Facebook friends, an employee could help enhance the perception of workplace friendship and develop trust with people at work by engaging in more organizational citizenship behaviors like voluntarily providing coworkers with physical or emotional support, being a more genuine listener, and assisting supervisors with tasks outside job requirements (Tawiah, 2013).

However, becoming friends with coworkers on Facebook does not always bring positive results. As noted before, coworkers that are not trustworthy can post negative information on others’ Facebook profiles (Walther et al., 2008), share personal information inappropriately, and jeopardize others’ employment using Facebook. Therefore it is important for individuals to assess their coworkers’ integrity before adding them as Facebook friends.

Furthermore, because women tend to see supervisors’ friend invitations on Facebook as inappropriate, women are more likely to experience negative feelings if their supervisors request their friendships on Facebook. They may experience higher levels of stress and lower levels of job satisfaction, which as literature has documented, could worsen an employee’s job performance, lower commitment, and harm the organization’s profitability (Nielsen et al., 2000). Therefore, supervisors should be more careful in their Facebook friending behavior toward women subordinates. Specifically, supervisors can set up groups including all subordinates on Facebook instead of friending them individually. This approach allows supervisors to strengthen coworkers’ relationships and at the same time avoid causing unfavorable feelings. Alternatively, supervisors can refrain from sending friend requests to subordinates. They should instead convey to subordinates that they would be amenable to becoming Facebook friends with subordinates if they initiate friend requests and want to connect. In this way, supervisors allow proactive subordinates to build personal networks and do not place any employees in difficult situations.

Implications can be derived for organizations as well. Because connecting with each other on Facebook can strengthen relationships between coworkers, which is beneficial for both employees’ job satisfaction and organizational outcomes, companies can encourage workplace friendship and promote mutual trust (e.g., through fair pay and regular happy hours) to increase the chance for employees to become Facebook friends. In addition, organizations should establish formal regulations on Facebook friending between coworkers and between coworkers and supervisors to prevent unwelcoming behaviors such as sexual harassment.

This study had several strengths. First, we examined Facebook friending behavior regarding people from work, which has not been documented in existing literature. Second, the results of our study provided important insights about what factors influence people’s willingness to friend coworkers on Facebook and whether supervisors’ Facebook friend requests would generate a feeling of inappropriateness among female and male employees. Third, our study had a relatively

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large sample size, which allowed the results to be representative. Another strength of the study is that the questionnaire used was based on scales with established reliability and evidence for validity.

Limitations of this study can be noted as well. First, the measures included in our questionnaire were not counterbalanced. We created the questionnaire using SurveyMonkey and the format was established. Future research that counterbalances the measures would provide more accurate data and results (Christensen, Johnson, & Turner, 2010). Second, this study relied on data from self-report surveys, which might be inconsistent with participants’ actual behavior. For example, an indication of wanting to have Facebook friends from work may not mean that the participants will actually be Facebook friends on Facebook. Third, most of the participants in this study were women, White, and under 30 years old, which made it difficult to generalize the results to men and other racial and age groups. More importantly, college students composed the largest percentage of participants, which might have yielded biased results because individuals’ relationships with coworkers and supervisors are likely to be different when they are in college and after they leave college. Future research should explore the difference in friending coworkers and supervisors on Facebook between college and noncollege students.

Future studies should investigate whether sex differences in the perception of inappropriateness when supervisors want to become subordinates’ Facebook friends would change if supervisors’ sex is specified. Intuitively, we expect female employees to feel more comfortable when their supervisors are women and hence they would feel it is appropriate for a female supervisor to want to be their Facebook friends. However, further studies are required to test this hypothesis. It would also be interesting to study how often supervisors send friend requests to subordinates and whether this action has led to any unfavorable consequence.

Future research could also examine people in a wider age group (e.g., 22–60) with a more diverse composition because they can better represent people in the workforce. The attitudes toward being Facebook friends with coworkers and supervisors may vary by age, racial and ethnic group membership, sexual orientation, and national origin. These are all interesting topics that are worth studying.

Finally, future studies can expand the literature on workplace and Facebook usage by assessing whether other variables such as organizational structure and culture affect employees’ decisions on friending coworkers or supervisors on Facebook. Studies can also be conducted to investigate whether supervisors and employees like becoming Facebook friends with each other, and whether becoming Facebook friends with people from work does indeed benefit career development, increase job satisfaction, and improve organizational profitability. By understanding people’s attitudes and behaviors in Facebook usage with others from work, individuals can utilize the social networking site to more effectively benefit both themselves and their organizations.

References


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