Ecphoric similarity and confidence judgments of eyewitnesses: effects of extra-memorial information

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Ecphoric similarity and confidence judgments
of eyewitnesses:

Effects of extra-memorial information

by

Eric Paul Seelau

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Department:  Psychology
Major:  Psychology

Approved:
Signature was redacted for privacy.

In Charge of Major Work
Signature was redacted for privacy.

For the Major Department
Signature was redacted for privacy.

For the Graduate College

Iowa State University
Ames, Iowa

1995
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ABSTRACT

Thefts were staged for pairs of witnesses who were subsequently given a photo-lineup from which to identify the thief. Individual witnesses \((N = 159)\) were asked by a uniformed security officer to make an identification from either a perpetrator-present or perpetrator-absent lineup. Witnesses who made an identification \((n = 122)\) were randomly assigned to receive either no information, or one of two types of extra-memorial information: (a) the co-witness had identified the same person from the photospread, or (b) the identified suspect had prior criminal involvement. The officer then asked witnesses to make confidence judgments and ecphoric similarity judgments (i.e., perceived resemblance of the witness’s memory of the perpetrator to the identified suspect). Analyses were conducted on a subsample of witnesses \((n = 96)\) selected such that all conditions contained the same proportion of witnesses who had viewed each of the three confederate thieves. Extra-memorial information was expected to inflate witnesses’ confidence judgments but not their ecphoric judgments. Results indicated that prior-involvement information inflated the confidence of inaccurate witnesses, but not that of accurate witnesses relative to witnesses in the control condition. Co-witness information did not significantly inflate confidence for either accurate or inaccurate witnesses relative to control witnesses. Contrary to predictions, extra-memorial information had the same effect on witnesses’ ecphoric similarity judgments as it did on their confidence judgments. Two-thirds of the witnesses who received extra-memorial information indicated that they relied on that information when making their confidence judgments, but there was no
evidence that witnesses were able to accurately estimate the degree to which their confidence judgments were actually affected. Eyewitness confidence judgments can be problematic because they are susceptible to inflation effects due to witnesses' exposure to extra-memorial information. Unfortunately, ecphoric judgments are also susceptible to the same inflation effects. These findings highlight the critical importance of two characteristics of a properly conducted lineup. First, the person who conducts the lineup should not know which person in the lineup is the suspect. Second, confidence and similarity judgments should be secured from the witness at the time of the identification, prior to the introduction of any extra-memorial information.
INTRODUCTION

Eyewitness testimony is crucial in a large number of trials conducted in the United States. One estimate suggests that eyewitness identification evidence is the only critical evidence in 77,000 cases in the United States each year (Goldstein, Chance, & Schneller, 1989). Although eyewitness testimony is invaluable and irreplaceable in the criminal justice system, it can have dire consequences when an eyewitness makes an error. In fact, eyewitness error is the single largest factor leading to false convictions in the United States (Borchard, 1932; Brandon & Davies, 1973; Frank & Frank, 1957; Huff, Rattner, & Sagarin, 1986; Rattner, 1988).

It is not the occurrence of a false identification per se that poses a problem for the courts. Rather, it is the occurrence of a false identification by a highly confident witness that creates a special problem (Wells, Lindsay, & Ferguson, 1979). An eyewitness who testifies in court that he or she is "uncertain" about his or her identification is unlikely to be given much evidentiary weight (Wells & Murray, 1983). On the other hand, the sincerely confident yet inaccurate witness who says "I am completely confident that I have identified the right person" is likely to be believed by the trier-of-fact (judge or jury). The testimony of a highly confident witness who has made a false identification may ultimately result in the conviction of an innocent person.

The term confidence in the eyewitness identification literature generally refers to the degree to which the eyewitness believes that he or she made an accurate identification (i.e.,
identified the guilty person). The crucial role that eyewitness confidence plays in people's determinations of eyewitness accuracy has been examined in surveys of potential jurors, and demonstrated in several experimental studies. Surveys of college students and of potential jurors indicate that people believe that confidence is an important indicator of eyewitness accuracy (Brigham & Bothwell, 1983; Kassin & Barndollar, 1992; Lindsay, 1994). As a result of this belief, witnesses who make false identifications with a high degree of confidence are likely to be more persuasive and have more impact in the courtroom than are less confident witnesses.

The prominent role that eyewitness confidence can play in the courtroom has been demonstrated in experimental studies using a mock trial setting. In one study, participants viewed a version of a videotaped armed robbery trial in which ten factors that had previously been shown to affect identification accuracy (e.g., retention interval, lineup instructions) were manipulated (Cutler, Penrod, & Stuve, 1988). Eyewitness confidence was the only factor manipulated in the study that affected mock jurors' estimate of the likelihood that an identification was accurate. The more confident that the witness was, the greater the perceived likelihood that the witness was accurate.

Eyewitness confidence does more than just affect the degree to which a person believes that the eyewitness is accurate. Interestingly, a witness's confidence in his or her identification affects how people evaluate other aspects of the witness's testimony. When people evaluated the testimony of witnesses who were not very confident, they used situational information (e.g., opportunity of the witness to view the culprit, amount of time the
culprit was in view of the witness) more appropriately than people who evaluated the testimony of highly confident witnesses (Lindsay, Wells, & Rumpel, 1981). It would seem that people become more sensitive to factors that can be relevant to the determination of eyewitness accuracy (e.g., the eyewitness's opportunity to view the culprit) when they have reason to question the accuracy of the eyewitness.

The lay person's belief in the reliability of eyewitness confidence as an indicator of eyewitness accuracy is reflected in the guidelines for judging eyewitness identification evidence that have been proposed by the United States Supreme Court. The Supreme Court suggests that the confidence of the witness should be considered when determining the likelihood that an identification is accurate (Neil v. Biggers, 1972). However, eyewitness research does not support the idea that confidence is a strong indicator of eyewitness accuracy. The most recent meta-analysis examining the confidence-accuracy relation indicates that eyewitness confidence accounts for about 6% of the variance in identification accuracy ($r = .25$; Bothwell, Deffenbacher, & Brigham, 1987). Although the magnitude of the correlation is between a small and medium effect according to Cohen's conventional values for the social sciences (1988), it has very limited practical value. Previous examinations of the relation were no more encouraging (Deffenbacher, 1980; Leippe, 1980; Wells & Murray, 1984).

The trier-of-fact who holds a belief that confident witnesses tend to be correct will have difficulty distinguishing a false identification from an accurate one. In fact, research has shown that people are generally unable to distinguish accurate from inaccurate eyewitnesses. Wells, Lindsay, and Ferguson (1979) videotaped the testimony of eyewitnesses to a staged
theft, and then presented the testimony to mock jurors. Jurors believed a majority of both accurate and inaccurate witnesses, and the jurors were unable to determine which of the witnesses were accurate. Throughout a series of similar studies, the expressed confidence of an eyewitness has consistently been a significant predictor of observers' beliefs in eyewitness accuracy (Lindsay, Wells, & O'Connor, 1989; Lindsay et al., 1981; Wells, Ferguson, & Lindsay, 1981; Wells et al., 1979; Wells, Lindsay, & Tousignant, 1980).

The expectation that eyewitness confidence and accuracy are related is derived from the belief that a witness who says that he or she is confident is making a statement comparable to "my memory of the culprit is so close to the appearance of the suspect that I believe they are the same person". If confidence is affected by factors that are not related to how good the witness's memory is, then the expectation is no longer warranted. Leippe (1980) discussed in detail how witness accuracy and witness confidence can be affected independently. Leippe argued that reconstructive memory processes can affect memory but not confidence, whereas suggestive social influences can affect confidence but not accuracy. If eyewitness confidence is not solely a function of accuracy or factors that influence accuracy, one should not always expect there to be a significant confidence-accuracy relation.

In the years since Leippe (1980) outlined this provocative framework, only two experimental studies have demonstrated the malleability of confidence independently of accuracy. In the first of these, witnesses to a staged crime were cross-examined about their memories for the event (Wells et al., 1981). Half of the witnesses were briefed prior to the cross-examination about the types of questions that would be asked, and witnesses were
encouraged to think about their answers. Overall, witnesses who had been briefed rated themselves as significantly more confident than did witnesses who had not been briefed. Mock jurors who watched videotaped cross-examinations also rated the briefed witnesses as more confident than the witnesses who had not been briefed. The briefing procedure increased only the reported confidence of the inaccurate witnesses and thereby increased the likelihood that jurors would accept inaccurate testimony as fact. Briefing the eyewitnesses effectively eliminated the usefulness of eyewitness confidence as an indicator of eyewitness accuracy.

In the only other study of confidence malleability, Luus and Wells (1994) investigated the effect of social influence on eyewitness confidence through the manipulation of co-witness information. Following a staged crime, witnesses who made an identification were given information about a co-witness's identification decision. Eyewitness accuracy was held constant by having all the witnesses in the study make an identification from a lineup that did not contain the actual culprit, rendering any identification inaccurate. After eyewitnesses made an identification (97% of eyewitnesses identified someone from a set of photographs) and received information about a co-witness's identification decision, they were asked to indicate how confident they were in their identification. Information about a co-witness's identification had a strong effect on eyewitness confidence. Compared to a control group of witnesses who were given no information about the co-witness's behavior, witnesses who were told that the co-witness identified the same person as they did were more confident in their identifications. This increase in confidence persevered even when witnesses were later told that the co-witness had actually identified someone else, or when the co-witness information was
withdrawn altogether. A decrease in confidence occurred for witnesses who were told that the co-witness did not identify anyone from the photospread, or who were told that the co-witness had identified a different person. The confidence deflation effect persevered even when those witnesses were later told that the co-witness had actually identified the same person that they had identified. Witnesses who were told that the co-witness identified an implausible person from the lineup showed an increase in confidence compared to witnesses in the control group. The only witnesses whose confidence did not differ from the no-information control group were those who had been told that the co-witness had identified a different person and then later told that the information was inaccurate. In general, co-witness agreement led to an increase in eyewitness confidence, and any discrepancy between the co-witness's identification decision and the eyewitness's own decision led to a decrease in confidence (Luus & Wells, 1994). Levels of eyewitness confidence were both raised and lowered by the manipulation of co-witness information after the witness made an identification.

It is clear that eyewitness confidence is not merely a function of the accuracy of an eyewitness's memory. As Leippe (1980) suggested, confidence can be influenced by social (and non-memorial) variables, such as another witness's beliefs about the identity of the suspect. If the witnesses in Luus and Wells' (1994) study based their confidence judgments on their memories for the event alone, the behavior of the co-witness would not have affected their levels of confidence. Hence, the confidence of the eyewitness can be considered a function of both memorial and non-memorial influences.
Non-memorial factors can influence the eyewitness’s confidence when the witness considers factors other than absolute similarity (between the identified suspect and the witness’s memory of the culprit) when making a confidence judgment. There are innumerable factors other than similarity that might affect the degree to which a witness is confident in his or her identification. For example, eyewitness confidence might be based upon a relative similarity judgment. That is, the witness might be confident not because the identified suspect greatly resembled the witness's memory of the culprit, but rather because the identified suspect looked more like the culprit than did the other lineup members (Wells, Rydell, & Seelau, 1993). Eyewitness confidence might also be based upon the ease or speed with which the witness was able to make the identification (Sporer, 1992). The witness who experienced the suspect "standing out" from the lineup during the identification might feel more confident than the witness who had to examine each lineup member carefully before being able to make a decision. As a final example, confidence could be based upon the degree to which the witness believed that the identified suspect was guilty.

A belief in the guilt of the suspect might be affected by a number of factors, including information about another eyewitness's behavior or a statement from a police officer regarding other evidence for or against the accused. Even the simple fact that the witness was called into court to testify might suggest to the witness that he or she had identified at least a plausible suspect from the lineup. The conclusion that the witness had identified "the right one" could increase the witness's level of confidence. Confidence, in such an example, is not exclusively a statement about how much an identified suspect resembles the culprit, but is also a statement
about how much the witness believes that the person identified is guilty.

From the perspective of a juror, however, the certainty with which an eyewitness testifies may seem only to be a statement about the reliability of the eyewitness's memory. The witness does not testify as to why he or she is certain, except for perhaps describing the conditions under which the culprit was initially seen. Other information that a witness might have been exposed to that could have affected the witness's confidence (and belief in guilt) is not a part of that testimony. For example, a witness who overheard a police officer say that the identified suspect's fingerprints were found at the scene of the crime will not be asked to testify that he or she was made aware of the information, much less whether or not it affected his or her confidence.

It is the role of the juror to determine the verity of the evidence, and therefore it might be considered an invasion of the jury's domain for the witness to consider incriminating or exonerating evidence related to the defendant. The witness's testimony should be limited to what he or she saw at the time of the crime. The testimony of a highly confident witness whose confidence is based on evidence not directly related to the identification can lead the jury to double count that evidence if that evidence is also exhibited in court. Imagine that after making an identification a witness is told that the person he or she identified was previously convicted of a similar crime. Perhaps in this case the witness was initially uncertain about the identification, but upon hearing about the suspect's prior record the witness became convinced that he or she had identified the guilty person. Such information may be communicated at a very early stage of the investigation of the crime, and may turn out to be untrue. When the
witness appears in court, he or she testifies about his or her certainty but not about the fact that it was based on information that was unrelated to his or her ability to make an identification. If information about the suspect's prior record also is admitted during the trial, that single piece of information will carry evidentiary weight with the jury in two forms: explicitly in the form of testimony about the suspect's prior record, and implicitly in the form of the unexpressed basis for the witness's confidence. Thus the information can be double-counted by jurors in their determination of the verdict. If information about the suspect's prior record is not allowed into court as evidence, it may still affect the jury's decision.

Witnesses may not necessarily be aware of the factors on which they base their confidence judgments. People are not always able to identify the factors that influence their responses, or to accurately estimate the degree to which their responses are affected by a particular factor (Nisbett & Wilson, 1977). Nisbett and Wilson assert that people are most likely to be accurate in their reports of what is affecting their judgments when the influential factors are available, plausible causes, and when there are few (if any) plausible but noninfluential factors. In the cases of eyewitness confidence, the effect that extra-memorial information has may not be evident to the witness, because there is an alternative plausible factor that certainly is affecting their confidence, namely similarity. The low confidence-accuracy relation, therefore, might be an indication that people are not particularly sensitive to what influences their confidence. Of course, asking a witness to make a judgment of certainty in no way prohibits the witness from considering all available information. In fact, the ambiguity in the confidence question might lead to an equal degree of ambiguity in the answer.
A confidence estimate as an indicator of accuracy becomes unreliable to the degree that the witness's memory is in error as well as to the degree that any other information on which it is based is inaccurate.

The malleability of confidence probably contributes to its poor performance as an indicator of eyewitness accuracy. One potential method of decreasing the effects of non-memorial influences on eyewitness confidence judgments is to obtain a statement of confidence from the witness immediately after the identification has been made (Wells & Luus, 1990). Immediate questioning should lead witnesses to base their confidence judgments primarily on their memory and insulate the witness's judgment from non-memorial influences that might follow (Wells, 1988). Securing a confidence estimate from the witness immediately after the identification, however, will not necessarily negate the influence of all non-memorial factors. A witness who identifies someone from a lineup because that person looked "the most like the culprit" might be very confident if he or she also believes that police would not ask a witness to attempt an identification without already having other evidence against the suspect.

If the confidence question is meant to be a statement about how much the identified suspect resembles the witness's memory for the culprit, a direct question about similarity may be a better indicator of the accuracy of the eyewitness's memory. Ecphoric similarity is the subjective resemblance between a stimulus and one's memory trace (Tulving, 1981). In the case of eyewitness identification, ecphoric similarity is the perceived or judged resemblance between the person identified and a witness's memory of the culprit. A witness's judgment of how similar the identified suspect is to the witness's memory for the culprit should be based on
the witness's memory only, as there is no other relevant information available to the witness on
which to base that judgment. Although it is assumed that some judgment of similarity
contributes to the witness's judgment of confidence, there are non-memorial factors that also
can contribute to that confidence judgment. Ecphoric similarity, therefore, might serve as an
indicator of eyewitness accuracy based on the witness's memory, unaffected by the influence
of non-memorial information.
A preliminary study was conducted to determine if there was an ecphoric similarity question that was significantly correlated with accuracy. Two features of the ecphoric similarity question were manipulated orthogonally, resulting in the four different questions that were tested. The first feature concerned whether the identified suspect or the witness's memory of the culprit served as the comparison object for the similarity judgment. Comparison judgments are often asymmetric (Kahneman, Slovic, & Tversky, 1982). For example, people judge that Poland resembles the Soviet Union more than the Soviet Union resembles Poland, suggesting that the choice of which object is being compared to will affect the degree of perceived resemblance. Therefore, witnesses who are asked to compare their memory for the culprit to the identified suspect might make different judgments than those who are asked to compare the identified suspect to their memory.

The second manipulated feature was whether witnesses were asked to rate the degree of resemblance between the identified suspect and their memory for the culprit on a dimension of similarity or on a dimension of difference. Questions about similarities lead people to focus on shared features of the comparison objects, whereas questions about differences lead people to think about non-shared or distinctive features (Tversky, 1977). Witnesses who rate resemblance in terms of the degree of difference should indicate less resemblance than should those who rate resemblance in terms of the degree of similarity because a question of differences should focus the witness on how the identified person and the culprit do not
resemble one another (Koriat, Lichtenstein, & Fischhoff, 1980). The four versions of the similarity question tested were:

1) Look-Similar: Look carefully at the photo in front of you. How similar is your memory of the gunman's appearance to the appearance of the person in the photo you selected?

2) Look-Different: Look carefully at the photo in front of you. How different is your memory of the gunman's appearance to the appearance of the person in the photo you selected?

3) Imagine-Similar: Try to generate an image of the gunman from the videotape in your mind. How similar is the appearance of the person in the photo you selected to your memory of the gunman's appearance?

4) Imagine-Different: Try to generate an image of the gunman from the videotape in your mind. How different is the appearance of the person in the photo you selected to your memory of the gunman's appearance?

Method

Undergraduate psychology students (N=250) viewed a videotaped re-enactment of a drive-by-shooting, either singly or in pairs. Witnesses were asked to provide a physical description of the gunman from the videotape, and then to try to identify the culprit from 6 photographs arranged in a 2 X 3 array. Half of the participants viewed a lineup containing the culprit (culprit-present lineup) whereas the remaining participants viewed a lineup that contained a substitute photo that was similar in appearance to the culprit (culprit-absent lineup). Participants who made positive identifications from the photospread (n=183) were randomly assigned to one of five experimental conditions. Participants assigned to the
confidence-only control condition \((n = 36)\) answered a confidence question and no ecphoric similarity questions. In the four ecphoric similarity conditions, participants responded to two of the four versions of the ecphoric similarity question followed by a confidence question \((n = 33\) for the look-similar condition, \(n = 38\) for remaining conditions). For example, participants who responded to a question on a similarity (e.g., look-similar) answered the corresponding question on a difference scale (e.g., look-different), and vice-versa.

Responses to the ecphoric similarity questions were on made on an 11-point scale, with endpoints labeled 0 (not at all similar) to 10 (completely similar) for the similarity questions, and 0 (not at all different) to 10 (completely different) for the difference questions. The confidence question asked witnesses to indicate "How confident are you that the person you identified is the gunman from the videotape?" on an 11-point scale with endpoints labeled 0 (not at all confident) to 10 (completely confident). All participants indicated how confident they were, allowing a confidence-accuracy correlation to be calculated for each of the four ecphoric similarity groups as well as the confidence-only control group. In addition, similarity-confidence correlations were calculated for the first ecphoric similarity question responded to by participants in the ecphoric similarity conditions.

**Results**

An alpha level of .05 was used for all reported statistical tests. Mean confidence was higher for witnesses who identified the culprit (accurate identifications) than for witnesses who either identified the culprit-replacement or another lineup member (inaccurate identifications), \(M_s = 6.46\) and 5.66, \(SD_s = 2.14\) and 1.85, respectively, \(F(1, 173) = 7.28,\)
Mean witness confidence did not differ as a function of being asked any other question, $F(4,173) = 1.09, p = .36$. In other words, asking witnesses to make an ecphoric similarity judgment in any form did not affect their mean confidence (see Table 1).

Although the form of the ecphoric similarity question did not affect mean confidence, it did affect the confidence-accuracy correlation. The confidence-accuracy correlation of participants who responded to the look-different question first was significantly greater than zero, $r(36) = .38, p = .02$, but the correlation was not significant for the other three versions.

### Table 1

**Mean Confidence and Ecphoric Similarity by Question Condition**

<table>
<thead>
<tr>
<th>Question condition</th>
<th>Confidence</th>
<th>Similarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>6.03 (2.06)$_a$</td>
<td></td>
</tr>
<tr>
<td>Look-Similar</td>
<td>6.18 (2.00)$_a$</td>
<td>6.42 (1.79)$_a$</td>
</tr>
<tr>
<td>Look-Different</td>
<td>6.26 (2.19)$_a$</td>
<td>4.87 (2.00)$_b$</td>
</tr>
<tr>
<td>Imagine-Similar</td>
<td>5.53 (2.08)$_a$</td>
<td>6.08 (1.28)$_a$</td>
</tr>
<tr>
<td>Imagine-Different</td>
<td>6.00 (1.74)$_a$</td>
<td>5.53 (2.02)$_{ab}$</td>
</tr>
</tbody>
</table>

*Note.* Standard deviations appear in parentheses. Means within a column that have different subscripts are significantly different at $p < .05$ by the Student-Newman-Kuels test.
of the ecphoric similarity question (see Table 2). The confidence-accuracy correlation for the confidence-only participants was not significantly different from zero, $r(34) = .29, p = .08$, and also not significantly different from the confidence-accuracy correlation of the look-different condition, $z = .416, p = .68$.

Ecphoric judgments made on the difference dimension (the look-different and imagine-different questions) were reverse-scored for comparison to responses on the similarity

Table 2

*Correlations Between Confidence, Ecphoric Similarity and Accuracy*

<table>
<thead>
<tr>
<th>Question condition</th>
<th>Confidence-accuracy</th>
<th>Similarity-accuracy</th>
<th>Similarity-confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Look-Similar</td>
<td>.16</td>
<td>.02</td>
<td>.71***</td>
</tr>
<tr>
<td>Look-Different</td>
<td>.38*</td>
<td>.44**</td>
<td>.45**</td>
</tr>
<tr>
<td>Imagine-Similar</td>
<td>-.04</td>
<td>.16</td>
<td>.64***</td>
</tr>
<tr>
<td>Imagine-Different</td>
<td>.19</td>
<td>.22</td>
<td>.38*</td>
</tr>
</tbody>
</table>

$a n = 36. \ b n = 33. \ c n = 38.$

* $p < .05$, two-tailed. ** $p < .01$, two-tailed. *** $p < .001$, two-tailed.
dimension questions. Witnesses who made an accurate identification judged resemblance between the identified person and the culprit to be higher than did witnesses who made an inaccurate identification, $M_s = 6.20$ and 5.35, $SD_s = 1.87$ and 1.81, respectively, $F(1, 139) = 7.12, p = .002, d = .45$. Witnesses who judged resemblance on a dimension of difference indicated a lower degree of correspondence between the identified person and the culprit than did witnesses who judged resemblance on a dimension of similarity, $M_s = 5.20$ and 6.24, $SD_s = 2.03$ and 1.54, respectively, $F(1, 139) = 10.08, p = .002, d = .54$. Only one of the ecphoric similarity questions (look-different) was significantly correlated with accuracy, $r(36) = .44, p = .006$ (see Table 2).

Discussion

The pilot study revealed that an ecphoric similarity question of the look-different form was significantly correlated with eyewitness accuracy, and that asking people to estimate confidence after such a similarity question resulted in a significant correlation between eyewitness confidence and eyewitness accuracy. It is possible that asking an appropriate question about ecphoric similarity provides witnesses with a salient basis for their confidence judgments. Witnesses who are not explicitly asked about similarity may be more inclined to consider other factors that may be unrelated to accuracy, resulting in a lower confidence-accuracy correlation.

There is research related to the idea that certain types of questions can serve as mental databases for subsequent questions. In one study (Strack, Martin, & Schwarz, 1988) for example, people were asked to indicate their "happiness with life in general" and their
"happiness with dating". When people were asked to rate their general happiness first, the correlation between the two measures of happiness was significantly smaller than when people were asked to indicate their "happiness with dating" prior to being asked about their "happiness in general", $r_s = .16$ and $.55$, respectively. The researchers concluded that asking a more specific question (e.g., happiness with dating) primed participants' answers to a subsequent general question (e.g., happiness with life in general). When "happiness with dating" is the first judgment made it can serve as a source of information for the second judgment of "happiness in general". In the case of an identifying witness, there are numerous potential sources of information on which to base a confidence judgment. However, the witness who is asked to make an ecphoric similarity judgment may use that information as a mental database in making a subsequent confidence judgment. Priming people about similarity may lead them to base their judgments of confidence on that factor rather than on competing non-memorial factors.
MAIN EXPERIMENT

The pilot study indicated that responses to one form of an ecphoric similarity question were significantly correlated with eyewitness accuracy. However, the confidence accuracy correlation also was high, and with a larger sample would probably have been significant as well. It would be premature to conclude that the ecphoric similarity judgment is superior to the eyewitness confidence judgment as an indicator of eyewitness accuracy. Recall that one factor that contributes to the unreliability of the confidence measure as an indicator of accuracy is its susceptibility to non-memorial influences. It has yet to be determined whether or not the ecphoric similarity measure also is strongly influenced by non-memorial factors. If similarity judgments are affected by non-memorial factors, similarity judgments may prove to be as equally unreliable indicators of eyewitness accuracy as confidence judgments.

From a practical standpoint, it would be unfortunate if the ecphoric similarity judgment is affected by extra-memorial factors because it would lose its value as a relatively pure measure of accuracy, just as confidence has been shown to be an impure measure based on factors other than accuracy. From a theoretical perspective, however, the influence of non-memorial manipulations on an ecphoric judgment would be provocative. Such a finding would raise interesting questions about a person's ability to make a judgment based only on his or her memory, and a person's ability to assess the accuracy of his or her memory as an eyewitness.

There are two general ways in which non-memorial factors could influence ecphoric
judgments. First, extra-memorial factors might actually change the original memory trace, rendering it more similar to the identified suspect or less similar to the identified suspect depending upon the type of additional information that the witness considered. One process that could inflate ecphoric similarity would be for an image of the identified suspect to be substituted for the witness's memory for the actual culprit. Indeed, this memory substitution process would lead to an erasure of any discrepancies between the memory for the culprit and the physical characteristics of the identified suspect, resulting in a correspondingly high (but meaningless) ecphoric similarity judgment. There is little evidence from the relevant memory literature to suggest that an original memory trace is ever actually changed (Chandler, 1991; McCloskey & Zaragoza, 1985; Windschitl, 1993). Therefore it is unlikely that an ecphoric similarity judgment would be affected by non-memorial factors via the witness altering his or her original memory of the culprit.

A second and more likely way that extra-memorial factors might influence ecphoric judgments is via the operation of a confirmation bias (Fischhoff, Slovic & Lichtenstein, 1977). The original memory might remain intact and unaffected by extra-memorial factors, but these extra-memorial factors might create a bias to search for ecphoric similarities (in the case of incriminating factors) or ecphoric differences (in the case of exonerating factors).

The present study examined the effects of two types of non-memorial information on confidence and ecphoric similarity judgments: co-witness agreement, and the suspect's prior criminal involvement. Co-witness agreement evidence has been shown to affect confidence (Luus & Wells, 1994), presumably because it increases the witness's belief that the person is
guilty. Should co-witness agreement affect ecphoric similarity? To the extent that such information only increases an eyewitness’s subjective likelihood of guilt, the expectation would be that similarity would not be affected. The fact that another witness identified the same individual could be interpreted, however, as a statement about the degree of resemblance between the identified person and the culprit. And if, for example, resemblance is so great that another person believes that the culprit and the identified person are the same, the witness's estimation of similarity might be increased.

Should the fact that a suspect has had prior involvement in similar crimes affect eyewitness confidence? Although not directly relevant to the determination of whether or not the suspect is guilty of committing the most recent crime, it is likely that such information will affect the witness's estimation of guilt, and therefore increase the witness's confidence judgment. A suspect's prior record, however, should not affect judgments of ecphoric similarity because that fact in no way addresses the correspondence between the eyewitness's memory of the culprit and the suspect's appearance.

There are five main questions that the present study addresses:

To what degree does co-witness agreement information affect the confidence of accurate witnesses?

Does incriminating information about an identified suspect's previous criminal involvement affect eyewitness confidence?

Do co-witness agreement and prior record information affect ecphoric similarity judgments made by eyewitnesses?
Do ecphoric similarity judgments affect confidence by focusing witnesses on ecphoric similarity as a basis for their confidence judgments?

Are people aware that non-memorial information influences their confidence?

Overview

The general procedure was modeled after the procedure used by Luus and Wells (1994). Undergraduate participants witnessed a staged theft that they were led to believe was real, and then each witness was interrogated individually by a person who pretended to be a campus security officer. The interrogation included the solicitation of details of the crime from the witness, the opportunity for the witness to attempt an identification of the culprit from a set of photographs, and measures of eyewitness confidence and ecphoric similarity.

Participants were randomly assigned to view either a culprit-absent or a culprit-present photospread. Participants who correctly identified the culprit from a culprit-present photospread were placed in the accurate identification condition. All participants who made an identification from a culprit-absent photospread were placed in the inaccurate identification condition, as were participants who identified anyone other than the culprit from a culprit-present photospread.

After a witness made an identification, the security officer either immediately asked the witness to make ecphoric similarity and confidence judgments (no-information condition), or first told the witness that his or her co-witness had identified the same person from the photospread (co-witness condition), or that the person he or she had identified had been involved in a previous theft (prior-involvement condition) before asking the witness to make
the similarity and confidence judgments.

The order of the dependent measures was also manipulated such that half of the witnesses answered the ecphoric similarity question before the confidence question (similarity-first condition), and the other half of the witnesses answered the questions in the reverse order (confidence-first condition).

Predictions

Ecphoric Similarity

1) Ecphoric similarity will be judged higher by participants who make accurate identifications than by participants who make inaccurate identifications. A photograph of the actual culprit should more closely resemble a person's memory of the culprit than should a photograph of another person.

2) There will be no increase in ecphoric similarity as a function of receiving information about a co-witness's identification decision or about the identified person's prior criminal involvement.

3) People's perceptions of similarity will not be affected by whether their confidence has been assessed prior to making the similarity judgment.

Confidence

1) Witnesses who make accurate identifications will indicate greater confidence than will witnesses who make inaccurate identifications. The most recent meta-analysis on the confidence-accuracy relation estimated $r = .25$ (Bothwell et al., 1987), and therefore accurate witnesses should be more confident than inaccurate witnesses.
2) Witnesses who receive either co-witness agreement or prior involvement information will be more confident than will witnesses who do not receive non-memorial information.

3) The confidence of accurate eyewitnesses will be less affected by non-memorial information than will the confidence of inaccurate eyewitnesses. Although the most recent confidence malleability study (Luus & Wells, 1994) found that co-witness agreement information did inflate eyewitness confidence, all of the witnesses in that study were inaccurate. Wells et al. (1981) found that only inaccurate eyewitnesses raised their confidence level after being briefed about the types of questions they would receive in an upcoming cross-examination. Therefore, inaccurate witnesses receiving non-memorial information should inflate their confidence estimates to a greater degree than should accurate witnesses.

4) Confidence will be lower for witnesses who answer the similarity question before the confidence question than for witnesses who answer the confidence question before the similarity question. Answering the similarity question should focus witnesses on similarity as a basis for confidence and thereby reduce the potentially biasing effects of non-memorial information.

5) When witnesses receive non-memorial information, confidence will be higher when the confidence question is asked before the similarity question than when the similarity question is asked before the confidence question. The ecphoric similarity question will provide the witness with a specific basis for making the confidence judgment, reducing the inflation effect that the non-memorial information has on eyewitness confidence.
Method

Participants

One hundred fifty-nine undergraduate psychology students (77 women and 82 men) volunteered to participate in the experiment in exchange for course credit. All attempts were made to have two participants as witnesses during each experimental session in order that each participant could serve as the other participant's co-witness. When this type of pairing was not possible, a confederate acted as another participant during the session. Confederates were instructed to let the participant provide information prompted by the experimenter during the session. If it became necessary for confederates to provide information, they were instructed to repeat what the other participant revealed, or to provide only minimal information.

Photospreads

Three white undergraduate students (one man and two women) assumed the role of thief in this study. A culprit-present photospread and a culprit-absent photospread were constructed for each confederate-thief, resulting in a total of six unique photospreads. Each photospread consisted of a suspect photo (either the culprit or a high-resemblance culprit replacement) and five distractor photos. Any single confederate's culprit-present and culprit-absent photospreads contained the same five distractor photographs, and differed only on whether the photospread contained a photograph of the culprit or of a high-resemblance replacement. Consistent with the type of photospreads used by Luus and Wells (1994), one of the five distractors for each confederate's photospread was selected to have some
resemblance to the confederate (i.e., might be considered a plausible match to the confederate) while the remaining distractors were selected to not resemble the confederate.

**Procedure**

Participants were met by the experimenter at a remote location and brought to the experimental room. Participants each signed a consent form (see Appendix A) indicating their willingness to participate in an experiment concerned with how evaluations of a person were influenced by knowledge of that person's opinions and appearance. Participants were told in the consent form and by the experimenter that they would be asked to examine questionnaire responses and photographs of people in order to evaluate them. As part of the cover story, the experimenter stated that following the completion of the experimental session, he or she would ask participants if they would be willing to have their photograph taken to be used for the study in the future.

After the general outline of the study was described the experimenter attempted to enter an adjoining room where the experimental materials were kept, only to discover that the door was locked. The experimenter asked participants to remain in the room while he or she went to get a key to unlock the door. Almost immediately after the experimenter left, a confederate-thief opened the door of the locked room, looked around, and quickly left the experimental area carrying a camera. The experimenter returned to find the previously locked door to be open. When necessary, the experimenter prompted the participants to explain why the door was opened, as well as the whereabouts of the camera. The experimenter, pretending to be very worried, then called who he or she identified as his or her supervisor on a
disconnected telephone to recount the story of the theft and to find out what should be done about it. During the phone conversation, the experimenter communicated the idea that the thief must have been a previous participant in the study because nobody else would have known about the location of the camera. The experimenter also mentioned over the phone that there is a list of names and photographs of all the previous participants in the study. After the call, the experimenter reported to the participants that the supervisor was calling the campus police, and that they would continue the study as planned until the campus security officer arrived. Participants were placed in separate rooms and were asked to fill out several questionnaires as the first step in the experiment as described to them in the cover story.

When the campus security officer (also a confederate) arrived, the experimenter recounted the story of the crime, mentioning the existence of the two witnesses as well as the set of photographs of possible suspects. The security officer asked that the doors to the rooms that contained the participants be closed in order that the officer could talk to each of the witnesses individually. This allowed each witness to believe that the other witness had already been interviewed and had attempted an identification. During the interview procedure the security officer first asked witnesses to describe what they could remember, and pretended to take notes of their recollections. The officer then asked the experimenter to bring in the photographs for the identification procedure. The officer removed a subset of photographs from the full set, indicating to the witness that all the photographs that could possibly correspond to the witness's description of the culprit were being removed for the identification procedure. The photographs used for a particular photospread were frequently
shuffled and were presented to participants in no systematic order or layout. The officer placed 6 photographs in front of the witness and asked the witness to identify the culprit. To help secure a high identification rate, the officer asked each witness to "identify the person that you saw" without explicit reference to the possibility that the culprit may not be present (Malpass & Devine, 1984).

For each witness who made a positive identification, the officer provided one of three types of information: (a) no information, (b) the other witness had identified the same person, or (c) the person identified had been involved in a previous theft. Each witness was then asked in a randomly determined order to make a confidence judgment and an ecphoric similarity judgment.

Confidence was assessed by the officer asking "How confident are you that this is the person that you saw with the camera, say, on a scale from one to ten, with ten being completely confident?". To measure ecphoric similarity, the officer said to the witness "I'd like for you to look carefully at this photo, and tell me how different is your memory of the person you saw from the person in this picture? Let's say, on a scale from one to ten, with one being not at all different and ten being completely different?".

After both witnesses had been interviewed, the experimenter brought them together for debriefing (see Appendix B). During the debriefing procedure, the experimenter revealed that the true purpose of the study had to do with eyewitness identification, that the theft had been staged for the experiment, and that the thief and the campus security officer were actually confederates. After this basic information was revealed but before any specifics about
the variables of interest or hypotheses were revealed, participants filled out a brief final questionnaire that included manipulation checks and some questions about their confidence judgments (see Appendix C). After participants had completed the questionnaires they were completely debriefed, thanked, and dismissed. (For a full version of the script used in the study see Appendix D.) This research was approved by the Iowa State University Human Subjects Review Committee.

**Subsample used for analysis**

Positive identifications were made by 122 (58 women and 64 men) of the 159 participants who witnessed the staged crime (a 77% positive identification rate). The identification rate was 83% (72 out of 87) for witnesses who viewed a culprit-present photospread, and 69% (50 out of 72) for witnesses who viewed a culprit-absent photospread. Twenty-six of the 122 witnesses who made an identification were removed from the sample used for analyses in order that the number of witnesses who had been exposed to each of the three confederate thieves would be represented equally in each of the experimental cells.

Witnesses to two of the thieves (one male and one female) appear three times in each between-subjects experimental cell and witnesses to the third thief (female) appear twice in each cell. Participants were removed from cells that contained an imbalance under the following rules: (a) participants who had identified distractors from culprit-present photospreads were removed first \( n = 13 \), followed by (b) participants who miscategorized their experimental condition as indicated by their responses to manipulation checks \( n = 7 \), followed by (c) participants who did neither (a) nor (b) \( n = 6 \). Participants were randomly
chosen for removal based on a particular criterion provided that there were no participants remaining in the preceding category. The final sample of 96 witnesses consisted of 45 women and 51 men.

Four of the 48 witnesses (8.3%) included in the inaccurate identification condition were witnesses who made an inaccurate identification from a culprit-present photospread, and therefore the inaccurate identification condition is not completely composed of identifications from culprit-absent photospreads. There were no significant differences in mean confidence between witnesses who made inaccurate identifications from culprit-present photospreads and those who made inaccurate identifications from culprit-absent photospreads, $M_s = 5.18$ and $5.46$, $SD_s = 1.78$ and 1.91, respectively, $t(65) = .54$, $p = .53$. The inclusion of distractor identifications from culprit-present lineups did not differ significantly between information condition, $\chi^2(2, N = 48) = .55$, $p = .76$. Fifteen of the 96 witnesses (15.6%) were paired with a confederate rather than with another participant. The frequency of these confederate-paired witnesses did not differ between the accuracy or information conditions, $\chi^2(5, N = 96) = 5.45$, $p = .36$. Means for the primary dependent measures of confidence and ephoric similarity did not differ significantly between the participant-paired and confederate-paired groups, $t(94) = -1.23$, $p = .22$, $d = 0.25$ for confidence and $t(94) = -1.44$, $p = .15$, $d = 0.30$ for ephoric similarity. Confidence judgments were not significantly higher for confederate-paired witnesses than for participant-paired witnesses, $M_s = 6.3$ and 5.6, $SD_s = 2.0$ and 1.9, respectively. Ephoric judgments were also not significantly higher for confederate-paired than for participant-paired witnesses, $M_s = 6.3$ and 5.7, $SD_s = 1.2$ and 1.5, respectively.
Results

Manipulation checks

Participants were asked after they participated in the experiment whether they knew before the experiment began that they would witness a theft as part of the experiment. One participant did not answer the question, and the remaining 95 indicated that they were not aware that they would witness a staged crime.

To determine if the information manipulation was successful, witnesses were asked two questions on the final questionnaire regarding the type of information that they received during the experiment: (a) Did the campus police officer mention that another witness had identified the same person as you?, and (b) Did the campus police officer mention that the person you identified may have been involved in a prior theft?

Participants were considered accurate only if their responses to both questions were correct. Participants in the co-witness condition who responded affirmatively to the first question only, participants in the prior-involvement condition who responded affirmatively to the second question only, and participants in the no-information condition who responded in the negative to both questions were scored as correct. Eighty-five of the 96 witnesses (88.5%) responded correctly to both questions, and the number of witnesses in error did not differ significantly by information condition, $\chi^2(2, N = 96) = 2.67, p = .26$. The percentage of participants who correctly categorized themselves in the co-witness information, prior involvement, and no information conditions were 91%, 81%, and 94%, respectively. The manipulation of information was relatively successful as indicated by the high percentages of witnesses who were able to recognize the type of information communicated to them.
Eyewitness confidence and ecphoric similarity

For all analyses ecphoric similarity was reverse-scored so that a higher number corresponds to greater perceived similarity. A 3 (Information Condition) x 2 (Identification Accuracy) x 2 (Question Order) x 2 (Question Type) repeated-measures analysis of variance (ANOVA) was conducted to test for mean differences on the within-subject measures of eyewitness confidence and ecphoric similarity.

There was no significant main effect for the within-subjects variable of question type, and no interactions of question type with any between-subject variables, indicating that the confidence and the ecphoric similarity questions were not differentially affected by any manipulations (see Appendix E). Ecphoric similarity judgments were expected to be affected only by identification accuracy, whereas confidence judgments were expected to be affected by the identification accuracy, information, and order variables. The remaining between-subjects effects must be examined to determine how both confidence and ecphoric similarity responded to the accuracy, information, and order variables.

Confidence was expected to be lower for witnesses who first answered the similarity question than for witnesses who answered the confidence question before making the similarity judgment. Ecphoric similarity judgments were not expected to differ as a function of question order. There were, however, no significant main effects or interactions for the order in which the questions were asked (see Appendix E). Confidence was not affected by whether or not witnesses first answered the similarity question, nor did similarity differ as a function of which question was first asked.
Confidence and ecphoric similarity were both expected to be higher for accurate witnesses than for inaccurate witnesses, and ecphoric similarity was expected to be higher in the co-witness and prior-involvement information conditions than in the no-information control condition. No significant main effects for information type or for identification accuracy were found (see Appendix E). There was, however, a significant between-subjects Information x Identification Accuracy interaction, $F(2, 84) = 4.11, p = .02$. The form of this interaction is described in the next section.

The lack of within-subject effects indicates that there were no reliable differences between the eyewitness confidence judgments and the ecphoric similarity judgments as a function of the between-subjects manipulations. Between-subjects analyses were conducted to investigate the effect that identification accuracy and information had on both dependent variables. Means and standard deviations for confidence and ecphoric similarity for accurate and inaccurate witnesses in each of the information conditions appear in Table 3.

**Between-subjects analysis of confidence**

A series of seven planned nonorthogonal contrasts were used to examine mean differences in confidence between cells in the 3 (Information Condition) × 2 (Identification Accuracy) interaction. The first three contrasts tested differences in confidence between accurate and inaccurate witnesses within each of the three information conditions. The next two contrasts tested for differences in confidence between the co-witness-information condition and the no-information control condition. The first of these contrasts compared confidence for accurate witnesses, and the second compared confidence for inaccurate
### Table 3

*Confidence and Ecphoric Similarity as a Function of Information and Accuracy*

<table>
<thead>
<tr>
<th>Question</th>
<th>Condition</th>
<th>Confidence</th>
<th>Similarity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-witness</td>
<td>accurate</td>
<td>6.69 (1.82)</td>
<td>6.50 (1.03)</td>
</tr>
<tr>
<td></td>
<td>inaccurate</td>
<td>4.88 (1.59)</td>
<td>5.50 (1.21)</td>
</tr>
<tr>
<td>Involvement</td>
<td>accurate</td>
<td>5.44 (2.45)</td>
<td>5.75 (1.69)</td>
</tr>
<tr>
<td></td>
<td>inaccurate</td>
<td>6.44 (1.09)</td>
<td>5.94 (1.39)</td>
</tr>
<tr>
<td>Control</td>
<td>accurate</td>
<td>5.69 (1.70)</td>
<td>5.81 (1.33)</td>
</tr>
<tr>
<td></td>
<td>inaccurate</td>
<td>5.13 (2.16)</td>
<td>5.19 (1.68)</td>
</tr>
</tbody>
</table>

*Note.* Standard deviations appear in parentheses.

\(n = 16\) for all means.
witnesses. The last two contrasts compared confidence levels between the prior-involvement information condition and the no-information condition, the first for accurate witnesses and the second for inaccurate witnesses (see Table 4).

Two of the seven contrasts revealed significant mean differences in confidence. First, confidence was significantly higher for inaccurate witnesses in the prior-involvement condition than for inaccurate witnesses in the no-information control condition, $F(1, 90) = 4.02, p = .048$, $M_s = 6.4$ and $5.1$, respectively. This is consistent with the confidence inflation effect expected for witnesses who received non-memorial information. Second, witnesses who received co-witness information indicated greater confidence when they were accurate than when they were inaccurate, $F(1, 90) = 7.67, p = .007$, $M_s = 6.7$ and $4.9$, respectively.

**Between-subjects analysis of ecphoric similarity**

The same seven contrasts used to examine the effects of identification accuracy and information on confidence were used to investigate differences in ecphoric similarity (see Table 5). The only contrast that was significant indicated that for witnesses who received co-witness information, accurate witnesses rated the suspect as more similar to their memory of the culprit than did inaccurate witnesses, $F(1, 90) = 4.03, p = .048$, $M_s = 6.50$ and $5.50$, respectively (see Table 5). Effect size estimates for confidence are slightly higher than the corresponding effect size estimates for similarity. According to Cohen (1988), conventional effect sizes in the social sciences are $\delta = .20$ for a small, $\delta = .50$ for a medium, and $\delta = .80$ for a large effect. It is evident that most of the corresponding effect size estimates for confidence and similarity fall within the same general range, from small to medium effect sizes.
Table 4

*Simple Effects Contrasts for Mean Confidence*

<table>
<thead>
<tr>
<th>Comparison groups</th>
<th>$F$</th>
<th>$p$</th>
<th>$d$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accurate vs. Inaccurate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-witness</td>
<td>7.67</td>
<td>.01</td>
<td>.58</td>
</tr>
<tr>
<td>Involvement</td>
<td>2.33</td>
<td>.13</td>
<td>.32</td>
</tr>
<tr>
<td>Control</td>
<td>0.74</td>
<td>.39</td>
<td>.18</td>
</tr>
<tr>
<td><strong>Co-witness vs. Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurate</td>
<td>2.33</td>
<td>.13</td>
<td>.32</td>
</tr>
<tr>
<td>Inaccurate</td>
<td>0.15</td>
<td>.70</td>
<td>.08</td>
</tr>
<tr>
<td><strong>Involvement vs. Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurate</td>
<td>0.15</td>
<td>.70</td>
<td>.08</td>
</tr>
<tr>
<td>Inaccurate</td>
<td>4.02</td>
<td>.05</td>
<td>.42</td>
</tr>
</tbody>
</table>

*Note. df = 1, 90.*
Table 5

*Simple Effects Contrasts for Mean Ecphoric Similarity*

<table>
<thead>
<tr>
<th>Comparison groups</th>
<th>$F$</th>
<th>$p$</th>
<th>$d$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accurate vs. Inaccurate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-witness</td>
<td>4.03</td>
<td>.05</td>
<td>.42</td>
</tr>
<tr>
<td>Involvement</td>
<td>0.14</td>
<td>.71</td>
<td>.08</td>
</tr>
<tr>
<td>Control</td>
<td>1.57</td>
<td>.21</td>
<td>.26</td>
</tr>
<tr>
<td><strong>Co-witness vs. Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurate</td>
<td>1.90</td>
<td>.17</td>
<td>.29</td>
</tr>
<tr>
<td>Inaccurate</td>
<td>0.39</td>
<td>.53</td>
<td>.13</td>
</tr>
<tr>
<td><strong>Involvement vs. Control</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accurate</td>
<td>0.02</td>
<td>.90</td>
<td>.03</td>
</tr>
<tr>
<td>Inaccurate</td>
<td>2.27</td>
<td>.14</td>
<td>.32</td>
</tr>
</tbody>
</table>

*Note. $df = 1, 90.$*
Self-reports of factors contributing to confidence

To determine whether or not witnesses exposed to non-memorial information would spontaneously indicate that their confidence judgments were affected by that information, they were asked to list the factors that they considered in reaching their confidence judgments. The open-ended responses were coded by independent judges for references to co-witness and prior-involvement information. The two independent judges were in complete agreement for all open-ended question coding. Only 1 out of the 32 participants in the co-witness information condition spontaneously listed co-witness information as a factor considered in reaching a judgment of confidence. No witnesses in the prior-involvement condition listed that information as a basis for their confidence judgments in their open-ended responses.

Eleven of the participants from the sample of 96 indicated that they were concerned about the possibility of accusing an innocent person when they were reaching their confidence judgments. The number of participants who indicated this concern did not differ significantly between information or identification-accuracy condition, $\chi^2 (5, N = 96) = 1.75, p = .88$. It is possible that such a concern might lead a witness to lower his or her expressed confidence, with the intent that authorities not rely on that identification as much as they would if he or she indicated greater confidence. The confidence of the witnesses concerned about making an inaccurate identification, however, was not significantly different from that of participants who did not spontaneously express any concern, $t (94) = 1.31, p = .20, d = .27$. 
Self-reported reliance on non-memorial information

Participants who were told that their co-witness had identified the same person as they had were asked to indicate on a 5-point scale the degree to which they based their confidence on that information. The endpoints of the scale were from 1 (not at all) to 5 (completely). The mean of the responses was significantly below the midpoint of the scale, $M = 2.52$ and $SD = 1.21$, $t(31) = -2.24$, $p < .04$. Almost 3/4 of the participants (72.4%) indicated some reliance on co-witness information in making their confidence judgments, and nearly 1/4 of the participants (24.1%) indicated a value greater than the midpoint of the scale. The percentage of participants who indicated values of 2, 3, 4, and 5 on the scale were 20.7%, 27.6%, 20.7%, and 3.4%, respectively. It is interesting to note that the degree to which participants said they based their confidence on the co-witness information was significantly correlated with their actual confidence judgments, $r(29) = .38$, $p = .04$.

Participants who received prior-involvement information about the suspect indicated on a five-point scale the degree to which their confidence judgments were based on that information. The mean of the responses was significantly below the midpoint with $M = 2.08$ and $SD = 1.00$, $t(31) = -5.20$, $p < .0001$. Although 60% of the participants in the prior-involvement condition indicated some reliance on that information in making their confidence judgments, only 4% indicated a value greater than the midpoint on the scale. The percentage of participants who indicated values of 2, 3, 4, and 5 on the scale were 16.0%, 40.0%, 4.0%, and 0%, respectively. The correlation between participants' estimates of the degree to which their confidence was based on the prior-involvement information and their actual confidence judgments was not significant, $r(25) = .01$, $p = .95$. 
**Experimenter effects**

The confidence inflation that occurred could be due to differential behavior of the campus police officer between information conditions. The first item on the final questionnaire asked: Did the Campus Police Officer try to influence your decision regarding which person you should identify from the photo set? Eighty-four of the 96 participants (87.5%) responded "no," and response rates did not differ significantly by information condition, $\chi^2(5, N = 96) = 3.43, p = .63$. The number of participants who indicated that the officer did try to influence their decision regarding whom they should identify in the co-witness, prior-involvement, and no-information conditions were $n = 6$, $n = 3$, and $n = 3$, respectively.

**Correlations**

The confidence-accuracy point-biserial correlation across all three information conditions was not significantly different from zero, $r (94) = .12, p = .244$. The similarity-accuracy correlation was not significantly higher, $r (94) = .17, t (93) = -.48, p > .10$. The correlation between the two dependent measures of confidence and similarity was significantly different from zero, $r (94) = .48, p < .001$. Correlations within each information condition appear in Table 7.

**Discussion**

This experiment examined the effects of extra-memorial information on the confidence and ecphoric similarity judgments of eyewitnesses. Results provide some support for the hypothesis that factors unrelated to witness memory can affect confidence independent of witness identification accuracy. A number of questions are also raised by the unexpected
Table 7

Correlations Between Confidence, Ecphoric Similarity and Accuracy by Information Condition

<table>
<thead>
<tr>
<th>Variables</th>
<th>Co-witness</th>
<th>Involvement</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence-Accuracy</td>
<td>.48 (.005)</td>
<td>-.26 (.146)</td>
<td>.15 (.419)</td>
</tr>
<tr>
<td>Similarity-Accuracy</td>
<td>.42 (.018)</td>
<td>-.06 (.734)</td>
<td>.21 (.253)</td>
</tr>
<tr>
<td>Similarity-Confidence</td>
<td>.50 (.004)</td>
<td>.62 (.001)</td>
<td>.32 (.071)</td>
</tr>
</tbody>
</table>

Note. Two-tailed p appears in parentheses. n = 32 for all correlations.

pattern of results that could have implications for police identification procedures. Ecphoric similarity judgments, unlike eyewitness confidence, were hypothesized to be resistant to non-memorial information that becomes available to the witness. As a result, similarity was expected to have a stronger relation to accuracy than did confidence. In this study, however, witnesses’ ecphoric similarity judgments and confidence judgments were not affected by the extra-memorial information in any reliably different way.

If ecphoric similarity judgments had been resistant to non-memorial information it potentially could have provided police with a more reliable method of estimating the accuracy of eyewitnesses. There is evidence from this study and from previous work (Luus & Wells,
1994) that eyewitness confidence estimates can be inflated and deflated by exposing witnesses to information that has little or nothing to do with their memory for the culprit or their ability to recognize the culprit. It is not difficult to imagine that a witness could become aware of non-memorial information (e.g., the suspect’s prior criminal record) during the course of the identification procedures, or some time after the witness has made an identification but before testifying in court.

Unlike confidence, an ecphoric similarity judgment is memory-based and should therefore not only be a more direct measure of the goodness of the witness’s memory, but also less affected by variables that are unrelated to memory. Calling to mind an image of a person in order to make a comparison is a reconstructive process, however, during which non-memorial information could affect the image of the person that is generated. The ecphoric similarity measure used in the present study was affected by the non-memorial information, and thus it seems that ecphoric similarity judgments can be as unreliable as confidence judgments as indicators of memory-based witness accuracy.

There were two possible explanations discussed earlier for a similarity inflation effect due to non-memorial information. The first possibility was that the witness might substitute the appearance of the identified suspect for the culprit in his or her memory. The second possibility was a confirmation bias, such that the witness might search for evidence in support of the belief that the suspect and the culprit were the same and should therefore have a high degree of resemblance. Neither of these possible explanations would predict that similarity judgments would be affected differentially by the two forms of non-memorial information. If
either the substitution or confirmation bias explanations were correct, witnesses receiving either of the two types of non-memorial information should have updated their memories or conducted a biased search for similarities. Ecphoric similarity judgments were significantly affected by one type of non-memorial information, the prior record information, but not affected by the co-witness information. The fact that ecphoric similarity judgments responded differently to the two types of non-memorial information raises questions about the plausibility of either of these explanations in the present study.

A third possible explanation for the relation between confidence and similarity is that witnesses made their ecphoric judgments based on how confident they were, and therefore their ecphoric judgments were sensitive to factors that affected their confidence judgments. Witnesses' confidence and ecphoric similarity judgments were highly correlated ($r = .48$), and the significant interaction that took an unexpected form for both variables suggests a close relation between confidence and similarity. The fact that there was no effect for the order in which the confidence and similarity questions were asked also points to either the same or a similar mechanism driving both of these variables. An ancillary analysis revealed that when controlling for similarity, there was still a significant interaction between identification accuracy and information on eyewitness confidence judgments, $F(2, 89) = 3.14, p = .048$. When controlling for confidence there was no significant interaction between identification accuracy and information on ecphoric similarity judgments, $F(2, 89) = .11, p = .894$.

The idea that confidence judgments somehow influence witnesses' ecphoric similarity judgments is counter-intuitive. In fact, it was predicted that asking witnesses to make ecphoric
judgments first would focus them on similarity as a basis for their confidence judgments. In other words, ecphoric similarity judgments would have a significant effect on witness confidence. In this study, however, neither mean confidence nor the confidence-accuracy relation was affected by whether or not witnesses first made similarity judgments. There is little evidence, therefore, that witnesses were basing their confidence judgments on ecphoric similarity.

A fourth explanation that seems most consistent with the data has to do with people's interpretation of the similarity question. Witnesses who make identifications in the real world probably expect the police to ask them how certain they are that they have identified the culprit. There is no evidence that the witnesses in this experiment did not believe that they had seen an actual crime take place, so presumably they would not find a question about their certainty to seem unusual either. It might have been difficult, however, for witnesses to interpret the ecphoric similarity question as one *only* of perceived similarity.

In the context of a psychology experiment (such as the pilot study), it is not hard for people to imagine that the researcher might be interested in their perceptions of similarity. In the context of a criminal investigation, however, witnesses might not understand what purpose would be served by asking them to make such a simple perceptual judgment. For witnesses with the expectation that they would be asked a certainty question, the ecphoric similarity measure may have served that purpose in their minds. In a sense, degree of similarity became the dimension they used to indicate their certainty or confidence, with witnesses who wanted to communicate to the police that they were certain indicating high similarity. When
witnesses were asked the similarity question, they might have interpreted it not as "How similar are the suspect and your memory of the culprit?" but rather "Are you sure the suspect and the culprit are the same person?", which can be considered a question about the certainty of the witness.

**Effects of co-witness information on confidence**

There was no significant confidence inflation effect for the accurate witnesses who received co-witness information. This study failed to replicate the confidence inflation effect for inaccurate witnesses as a function of co-witness agreement information that was obtained by Luus and Wells (1994). The present study differs from Luus and Wells in several ways that might have contributed to the unexpected null effect.

First, the two studies differed in the amount of time between the introduction of extra-memorial information and the point at which witnesses were asked about their confidence. In the Luus and Wells study, there was at least a several minute delay between the time that the information manipulation was delivered and the time that witnesses were asked to make a confidence judgment. There was an even longer delay in the other previous study that examined confidence inflation effects. Witnesses who were asked to consider their responses to cross-examination questions in the "briefing" study had 18 minutes after they had been briefed by the experimenter to consider their confidence estimates (Wells, et al., 1981). The delay between the presentation of non-memorial information and the solicitation of the confidence or similarity judgment was between 5-10 seconds in the present study. Perhaps this comparatively brief interval did not allow witnesses enough time to process the information to
the degree that they could use that information in estimating their confidence. If that is the case, it may be that even when witnesses are exposed to co-witness information, securing a confidence statement from a witness immediately after that point is sufficient to prevent any confidence inflation effects that would otherwise have resulted from the co-witness information.

A second difference is that witnesses in the Luus and Wells study were asked to make an identification by the experimenter rather than by a security officer. Having to make an identification in the presence of an officer might have made more salient the consequences of making a positive identification, particularly a very confident one. In contrast, identifying the potential culprit for the experimenter might have been considered by participants as merely “helping out” the experimenter without full awareness that they may be called upon for more information. The fact that there was a confidence inflation effect for the witnesses in the prior involvement condition, however, suggests that the lack of a confidence inflation effect as a function of co-witness agreement information was not merely unwillingness on the part of witnesses. This difference between the Luus and Wells study and the present study could have contributed to the lower mean confidence as well as the lower positive identification rate found in the present study.

Witnesses in the co-witness information condition who were accurate were significantly more confident than were witnesses who were inaccurate. It was predicted that accurate witnesses would be more confident than inaccurate witnesses overall, but to a lesser degree when witnesses received non-memorial information. The only significant difference in
confidence between accurate and inaccurate witnesses, however, was in the co-witness information condition. Although accurate witnesses were more confident than inaccurate witnesses in the co-witness information condition, this was not attributable to differential effects of co-witness information.

**Effects of prior-involvement information on confidence**

Inaccurate witnesses who received prior-involvement information indicated greater levels of confidence than inaccurate witnesses who received no information. There was no confidence inflation effect for the accurate witnesses, which is consistent with the hypothesis that non-memorial information would have greater impact on the confidence judgments of inaccurate witness than on those of accurate witnesses. It is clear that the lack of confidence inflation for accurate witnesses was not due to a confidence ceiling effect. Mean confidence for the accurate witnesses was only 5.4 on the 10-point scale, and therefore there was room on the scale for witnesses to indicate higher levels of confidence. One reason for the differential effects of prior-involvement information on the confidence of accurate and inaccurate witnesses could be that the accurate witnesses already have some basis for making confidence judgments, namely the similarity between the photo of the culprit and their memory of the culprit. Inaccurate witnesses cannot rely on resemblance to the same degree as accurate witnesses, which could lead them to incorporate other information that is made available into their confidence estimations. The incorporation of non-memorial information is particularly problematic if it is confined only to inaccurate witnesses, for it is the increased confidence of the inaccurate witnesses that lead triers-of-fact to believe what is, after all, inaccurate testimony.
How are co-witness information and prior-involvement information different?

A confidence inflation effect occurred for inaccurate witnesses exposed to prior-involvement information, but the expected effect for co-witness information did not occur. An examination of how these two types of information differ might offer some insight regarding why the co-witness information failed to affect witness confidence. Both prior-involvement and co-witness information were expected to raise confidence by increasing the suspect’s likelihood of guilt in the mind of the witness, but the types of information may not be equivalent in the way that they influence the likelihood of guilt estimate.

Information that a co-witness has made the same identification is a statement about the co-witness’s belief that the suspect is the culprit. Although the information about a co-witness’s belief may affect a witness’s likelihood of guilt estimate, the witness should first have to make a judgment about the degree to which he or she is willing to trust the memory of the co-witness. There is evidence that witnesses consider closely the co-witness’s memory, at least in relation to their own memories. Witnesses in the Luus and Wells (1994) study whose co-witness identified a plausible person from the lineup lowered their confidence relative to witnesses in the control group, whereas witnesses whose co-witness identified an unlikely or implausible person showed an increase in confidence over control witnesses. It appears that witnesses were taking into account their perceived reliability of their co-witness.

Witnesses do have some other way of interpreting their co-witness’s identification evidence by virtue of having the same general experience. If a witness makes a relative judgment (selecting the lineup member who looks the most like culprit) it would be reasonable
for him or her to think that the other witness also might have chosen the "closest" person without a strong belief that that person is the culprit. The co-witness information under those conditions is not necessarily convincing evidence that the witness (or the co-witness for that matter) is correct. It is also possible that the witnesses in the control condition assumed that their co-witness made the same identification as they did even though they were not provided that information. Witnesses in the control and co-witness conditions would have made their confidence and ecphoric judgments under the same assumptions, which might account for the lack of inflation effects for the co-witness agreement witnesses.

Witnesses who receive prior-involvement information, on the other hand, do not have to make any judgments regarding the reliability of their co-witness’s memory. The information that they are given is unrelated to their memory or the memory of their co-witness, because it has nothing to do with the most recent theft. Although this information does not constitute direct evidence that the suspect committed the recent theft, learning that the suspect had been involved in a prior theft might increase a witness’s belief that the suspect is guilty. It is probably persuasive to the most uncertain witness to learn that out of all of the people who had previously been in the experiment, the person that he or she thought looked most similar to the culprit had a criminal background. It would be difficult for witnesses to dismiss this as mere coincidence, or to construct a reasonable explain that is based on the assumption that the identified person is actually innocent of the crime. In contrast, witnesses in the co-witness agreement condition who are relatively uncertain in their choice can assume that the other witness went through the same decision-making process that they did (whatever that might
have been). The fact that their co-witness made the same identification, therefore, may not be interpreted by witnesses as a form of independent evidence that the suspect is guilty.

Witnesses who receive either type of information may decide that the information is an inappropriate basis for confidence (although whether or not witnesses can prevent its effects on their judgments remains an open question). Witnesses who receive prior-involvement information do not have to struggle with the interpretation of the information that the other witness has provided. Due to the short time lag between the introduction of the non-memorial evidence and the request for confidence and similarity judgments by the officer in the present study, it is possible that witnesses did not have the time that was necessary for them to complete the evaluation of the co-witness and the co-witness's identification, and therefore it was not incorporated into their confidence judgments.

*Self-reported reliance on non-memorial information*

Only one witness out of the 32 exposed to co-witness information spontaneously mentioned the information as a contributing factor in their confidence judgments. When asked specifically about the degree to which the co-witness information affected their confidence, three-fourths mentioned that it had some effect. Although no witnesses who received prior-involvement information mentioned that information on the listing task, about 60% of them indicate some reliance when directly asked about its influence. This is an indication that people believe that there is nothing unacceptable with using these forms of non-memorial information as a basis for confidence. People may believe that this information has direct bearing on whether or not the suspect is guilty, and it is therefore appropriate to consider when estimating their own confidence.
The fact that witnesses indicated some reliance on extra-memorial information does not mean that they were able to accurately report the impact that it had on their confidence. The correlation between witnesses’ estimates of their reliance on prior-involvement information and their confidence judgments was not significantly different from zero. However, in the co-witness condition, self-reported reliance was positively correlated with actual confidence, such that the people who indicated that they relied more on the co-witness information in their confidence judgments had actually been more confident. One interpretation of this is that co-witness information did increase confidence and witnesses were aware of that influence. An alternative is that when asked about the effect of co-witness information on their confidence levels, witnesses who had indicated a high degree of confidence took advantage of the opportunity to point to a source other than their own memories for their confidence in their identifications, in the event that they should turn out to be incorrect. Witnesses were asked about the sources of their confidence after they had been made aware that they were in a psychology experiment related to eyewitness identification, which might have led them to consider more seriously the possibility that they had made an error, or had even been led into making an error.

It is interesting that the co-witness information did not affect witness confidence, yet witnesses’ estimates of influence were correlated with their confidence. In comparison, prior-involvement information did have some effect on witness confidence, but witnesses were not able to effectively assess that influence. It seems unlikely that estimating confidence was a process for which witnesses had introspective access. Witnesses may instead have engaged in
a retrospective search for reasons that they might be confident in order for them to evaluate
the impact that extra-memorial information had on their judgments. They may have been
indicating how much they believed that extra-memorial information should affect a judgment
of confidence (see Nisbett & Wilson, 1977). Nisbett and Wilson suggested that when asked to
indicate how a response was affected by a given stimulus people make judgments based on
how plausible it is that the stimulus would have affected the response (p. 248). There was a
tendency for witnesses who received co-witness information to be more willing to indicate
that they relied on that information than were witnesses who received prior-involvement
information (although the difference was not significant). Witnesses may have found it more
plausible that co-witness agreement information would affect their confidence judgments than
information about the prior record of the suspect. It is also possible that witnesses consider it
less legitimate to base their confidence judgments on prior involvement information than to
base them on co-witness information.

The correlation between witnesses’ confidence and their estimates of the influence that
cowitness agreement information had on confidence might be a function of whether witnesses
had any reason to indicate some reliance on a factor other than their own memories. Witnesses
who were not very confident had no need to search for reasons to defend their lack of
confidence. Confident witnesses may have felt obligated to not only come up with reasons for
why they thought they were right, but also to cite some factor or factors other than their own
memories on which to blame a false identification in the event that they were wrong about the
identity of the suspect.
Suggestions for future research

The timing of the presentation of non-memorial information and the assessment of eyewitness confidence may be critical for confidence inflation (or deflation) effects to occur. The amount of time needed to fully consider non-memorial information may be greater than that allowed in the present study. The relatively brief period between the presentation of non-memorial evidence and the estimation of confidence and similarity may have contributed to the lack of confidence inflation effects in the co-witness identification condition. Witnesses provided with an extended period of time to consider their confidence (i.e., longer than the 10 minutes allowed in the Luus and Wells study) may be able to consider more carefully how certain they are, and perhaps the reasons for their certainty. Under these conditions witnesses may be less affected by non-memorial information. Future research could investigate the degree to which the length of time between the introduction of non-memorial information and the witness's confidence judgment contributes to the malleability of eyewitness confidence.

The interval between the witness's identification and the introduction of non-memorial information might also be critical. In the present study and in Luus and Wells (1994) witnesses received non-memorial information almost immediately after making their identifications. If witnesses are given enough time to consider and solidify their certainty judgments before other information is introduced, the impact of the non-memorial information might be reduced. The timing of the introduction of non-memorial information could also be explored in future research.

The ecphoric similarity and confidence estimates that witnesses reported in the present
study were influenced by non-memorial information. A witness’s belief that he or she has identified the guilty person might not be a function of a good memory, but rather a function of having been exposed to some form of extra-memorial information. There may be other witness perceptions that can be affected by non-memorial information. The Supreme Court has suggested that in addition to witness confidence, the trier-of-fact should also consider the witness’s opportunity to view the culprit, and the degree of attention that the witness paid to the culprit at the time of the crime (Neil v. Biggers, 1972). Witnesses who believe that they are “right” may not only indicate a high level of confidence, but also indicate that they got a good look at the culprit, and that they paid a high degree of attention. Witnesses might reason that if this were not the case, they would not have been able to recognize and identify the guilty person. The negative effects of introducing non-memorial information might therefore extend beyond witnesses’ confidence judgments to other components of their testimony.

Finally, other forms of an ecphoric-similarity question might be tested in the future. Although the similarity question used in the present study seemed to be a good candidate based on the pilot study, it did not perform particularly well. It is not necessarily the case that the difference question used was a poor measure of ecphoric similarity. In the pilot study, unlike in the main experiment, witnesses knew that they were being asked questions as part of a psychology experiment. The witnesses in the pilot study may have been able to answer the similarity question in isolation, without considering their confidence. In the staged crime paradigm, witnesses might have been unable to consider the similarity judgment as only a
judgment of resemblance, and interpret the measure as a question of how certain they were about their identification. In the context of a criminal investigation it might be difficult for witnesses to believe that there could be any purpose to making a simple perceptual judgment. The question might be asked more carefully, stressing that the ecphoric measure is a question about their perceptions of similarity and not a question about confidence.

**Conclusion**

Asking witnesses about their confidence is intended to be a question about the goodness of their memories. High eyewitness confidence can be an indicator of an excellent and accurate memory, but it can also be indicative of the witness’s belief that the suspect is guilty as a function of additional “evidence” that is unrelated to the accuracy of the witness’s identification decision. It may not be possible for witnesses to determine what factors influence their confidence judgments, or to adjust their confidence for those influences.

The ecphoric similarity judgment was proposed as a possible alternative indicator of eyewitness accuracy. In the present study, it appears that witnesses were unable to make pure estimates of similarity that were free from considerations of non-memorial information and their own confidence. If ecphoric similarity had been resistant to non-memorial influences, it would have been evidence that people are able to provide a reliable estimate of the accuracy of their own memories, at least relative to the eyewitness confidence judgment. This could have lead to other ways of assessing eyewitness confidence than those currently in use.

The legal system need not wait, however, for a better indicator of accuracy to be found in order to improve the reliability of eyewitness identifications and testimony. There are
procedures that can be implemented that would reduce if not eliminate the introduction of potentially biasing extra-memorial influences in eyewitness identifications (Wells & Seelau, in press). First, the person conducting the lineup should be unaware of who the suspect is in the lineup. This makes it unlikely that the person conducting the lineup can communicate to the witness which person is the suspect, or any potentially incriminating or exonerating evidence about the suspect before or after an identification has been made. Second, eyewitness confidence measures should be taken immediately after the identification, before any other influences are able to affect that judgment. Third, the witness’s confidence judgment should be recorded at the time of the identification. Thus, any discrepancy between the degree of confidence the witness testifies to in court and his or her estimate given at the time of the identification can be detected and challenged in court. The need for obtaining a confidence measure immediately after a witness has made an identification was made very clear in this study, where confidence judgments were affected after only a few seconds had passed.

The legal system currently ignores not only the weak relation between eyewitness confidence and identification accuracy, but it also fails to take measures that might improve the utility of confidence as an indicator of accuracy. The fact that the courts accept eyewitness confidence as an indicator of accuracy without recognizing other potential sources of confidence unrelated to memory can lead to unnecessary eyewitness confidence inflation. When witnesses base their confidence on information unrelated to their memories, they are indirectly increasing the impact of the information (that may be inadmissible) in the courtroom.
REFERENCES

Borchard, E. Convicting the innocent: Errors of criminal justice. New Haven, CT: Yale University Press.


APPENDIX A: CONSENT FORM

In this study, we are interested in how people evaluate others. If you agree to participate, you will be asked to evaluate several individuals based on different types of information that will be provided about them. For each person, you will be given a file folder containing information on which to base your decision, which may include a photograph, responses to questionnaires about that person's beliefs, and demographic information. The session will last about an hour. In exchange for your participation you will receive one hour of extra credit toward your course grade.

All of your responses will be anonymous, and be kept completely confidential. The experimenter will be available to answer any questions you may have regarding the study. There are no known risks to you for participating in this study. However, if at any time you feel uncomfortable you may withdraw without loss of research credit for your participation in the study. Your participation in this study is completely voluntary.

I have read and understand the above information and agree to participate in this study. I understand that I may withdraw from the study at any time and still receive credit for participation.

________________________  ______________________
Printed Name                 Date

________________________
Signature
APPENDIX B: ORAL DEBRIEFING

I would now like to tell you a little bit more about this study. Initially you were told this study was concerned with evaluating the opinions of other students. However, you were never actually asked to evaluate anyone. In fact, this part of the study was not what we were really interested in.

There are some things that I haven't been able to tell you up to this point. In some psychological research, telling people the true purpose of the study may lead them to react differently than they would otherwise.

This study is actually a study of eyewitness memory. The theft that you witnessed was not an actual theft. It was staged for this experiment, and was designed to be as realistic as possible. As you might guess, the DPS officer is not really with campus security, but is actually another experimenter playing that role. Our main objective was to present what appeared to be a real theft, and then have you try to identify the thief from a set of photos. We couldn't tell you in advance that you were going to witness a theft, as you may have tried to pay closer attention to the characteristics of the thief. We wanted your reactions to be as natural as possible -- as if you had been a witness to a real crime.

Before I tell you any more about what we're interested in learning about in this study, I'd like you to answer a few more questions. (Participants completed the Final Questionnaire.)

We are interested in finding better ways of measuring how confident people are in their identifications. People's confidence estimates can be affected by a number of things, including knowing who other witnesses identify, or information about a suspect's past criminal record. Obviously, any information you might have been given in this case was untrue. In fact, you were randomly assigned to hear the type of information that you did. Ultimately, we are trying to find a measure of confidence that is resistant to these types of information.

I hope that you can see why we couldn't tell you in advance what was going to happen in this study, and I need to ask for your help. It's important that we get people's natural reactions to the theft, and that they believe that the theft was real. So I need to ask you not to tell anyone about what really happens in this study. If people know what's going on, the responses we get from them won't help us at all -- and it will also make their experience unrewarding for them. We really appreciate your participation in this study, and if you have any questions please let me know.
APPENDIX C: FINAL QUESTIONNAIRE

1. Did the Campus Police officer try to influence your decision regarding which person you should identify from the photo set? _____ Yes _____ No

2. If you made an identification, you were asked to indicate how confident you were that you had identified the right person. Please list all of the factors that you considered in reaching your confidence judgment. Take all the time that you need.

3a. Did the Campus Police officer mention that another witness had identified the same person as you? _____ Yes _____ No

3b. If you answered YES to Question 3a, to what degree, if at all, did you base your confidence judgment on that information?

1  2  3  4  5

Not at all Completely

4a. Did the Campus Police officer mention that the person you identified may have been involved in a prior theft? _____ Yes _____ No

4b. If you answered YES to Question 4a, to what degree, if at all, did you base your confidence judgment on that information?

1  2  3  4  5

Not at all Completely

5. Before you came into the lab today to participate in this study, did you know that you would witness a staged theft? _____ Yes _____ No
APPENDIX D: PROTOCOL

Experimenter (E) should be at lab at least ten minutes before the first session. Unlock all doors and post the “Do Not Disturb” sign on the outer door. Make sure phone is “plugged in”. Get out consent forms, pencils, etc. Put a blank questionnaire in each cubicle. The campus security officer (CS) should be dressed and the thief (T) should be waiting with the camera in the inner room.

Phase I

E: Meet participants on third floor and take them upstairs to the lab. Seat them in the main room. Hand out consent forms; collects consent forms.

E: “As it said on your consent forms, we are trying to see how your evaluations of a person are influenced by your knowledge of that person’s opinions and appearance. What we are currently doing is having students like you come into the lab and fill out a series of questionnaires that measure different opinions and attitudes. While each student is here, we have been taking their picture for future use in this study.”

“The first thing we would like to have you do today is fill out a questionnaire so you can see what the task is like. Then I’ll be giving you a group of questionnaires that other people have already filled out -- sometimes you may also get a picture of that person -- and you’ll be asked to evaluate them on various dimensions. Each of you will be evaluating a different set of people.”

“After you are both finished with this part of the study, I’ll ask your permission to take your picture so that we can also use your answers in the future. It is important that we get a large sample of people, and the photos are taken right here, so this part of the study won’t require any extra time on your part. However, I’ll ask for your permission for this only at the end of the experiment, once you have seen what is involved.”

“Does anyone have any questions?” (pause)

E: Try opening the door leading to cubicles. “This door seems to be locked. It must have shut when I came to get you. I need to go get the key. I’ll be back in just a minute and then we can get started.” Exit waiting room to the left.

Thief (A few seconds later) open cubicle door, look around at participants, and exit left with the camera in hand.

E return to find that the door is now open.
Phase II

E: Look around the room with a puzzled expression.

E: “Oh. Is somebody back there? The door’s open now.”

Walk into room and “discover” that the camera is missing. Very flustered, return to the main room to find out what happened:

“Who was it?” “What did he/she look like?” “Did he/she just walk out?” “Did he/she say anything?” “Where did he/she go?”

E: Tell participants to stay put and quickly exit room as if to follow thief. Return a few seconds later and ask for more information. Apologize to the participants again; have them wait while you “call your supervisor”.

E: 1) “Eric? This is ____. Listen... I think someone just stole our camera. I mean... I’m not sure how it happened, but I got ready to start a session and the door leading into the back was locked. It must have shut when I went downstairs to get the participants. I went to the other office to get a key, and when I came back, one of the back doors was open, and the camera was gone.”

2) “No, I don’t think so... I don’t think there’s anything else missing... I guess I’m not sure about that... Yes, there were people already in here... and they said someone came out of the room with the camera... No, it was while I was down the hall...” (Pause in the phone conversation as necessary to be convincing that you are really talking to someone.)

3) “Who do you think it could have been?... I wondered about that... You think it could have been one of the people who have already been in the study? I mean... who else would know there was a camera in there??”

4) “Well, they said it was a fe/male...” (Give description as reported by participants, asking them more questions as necessary.)

5) “What do you want me to do? OK... OK... OK... Should I go ahead and finish this?... OK, thanks... I’m so sorry about this...”

E: Hang up. Tell participants:

“I guess my supervisor is going to handle this. He’s calling campus police. But we’re supposed to go ahead with the study.”

E: Apologize and answers any questions. Separate participants to “begin the study”.
Participants are given materials and instructions in their separate cubicles. Each participant is given a folder.

E: “The first thing I’m going to have you do before evaluating anyone else is to fill out one of these questionnaires so you can become familiar with the types of things we’re interested in. The directions are on the top. I’ll be back in a few minutes. Please wait here, even if you finish before I come back. Do you have any questions?”

Doors should be kept open.

E: Select appropriate photos for the thief (by condition) and have them ready for Phase III.

Phase III

CS knocks on and opens outer door, and has an introductory conversation in the waiting room with E.

CS: “Hi, I’m Officer _____ from the Department of Public Safety.”

E: “That was fast.”

CS: “Our office is right down the street.”

E: “Here, let me take your coat...” (Pause.)

CS: “We got a call about a stolen camera. Am I in the right place?”
   “Could I get your name please?”
   “Would you tell me what happened?”

E: “The camera was taken from one of the rooms back there. I left for just a minute and someone must have already been in there... and came out with the camera. The people in this study were just sitting out here and saw the whole thing. They told me about it when I came back and found the door open. I tried to go after him/her, but I didn’t see anyone.”

CS: “What do you mean? Who are these people?”

E: “Oh, I’m sorry. We’re running a psychology experiment. These people had signed up to be in it, but when I was gone for a minute, someone came in and took the camera we had. But I have them back there filling out questionnaires anyway. I didn’t think you’d come right away.”
CS: “Who has a key to this room?”

E: “Just my supervisor and myself, as far as I know. But I left it unlocked for a few minutes when I went down to get the students for the study, so I guess whoever it was didn’t really need a key.”

CS: “Okay... What kind of camera was it?”

E: “It was a Minolta 35 mm. I’m not exactly sure what model it was, but I can find out.”

CS: “Do you have any idea who might have wanted to take the camera?”

E: “Well, when I called my supervisor, we were thinking it had to be one of the previous students from this study, because no one else knew about the camera. We just use it to take a picture of each person at the end of the session. So everyone who has been through here knew about it, and actually we’ve got pictures of all of them... In fact, it must have been one of the people that have already been in this study. First of all, there’s no one else who could have known about the camera -- Nobody else has been back here except me and my supervisor. Not only that, but...” (E speaks so that only CS can hear...) “…so you see it had to be one of them.”

CS: “Isn’t it possible that someone else from the department may have come in to get the camera, or does anyone else work here?”

E: “No. There’s just two of us working on this right now, me and my supervisor, and he’s the one that called you.”

CS: “All right... Well, you get those pictures. I’m going to talk to them. Why don’t you close those doors; I should probably talk to them separately.”

_E: shut both cubicle doors. After a minute, tell each witness:_

“The campus security officer is talking to the other person first. I guess it’ll be a few minutes before he/she will want to talk to you. If you’ve got something you can do while you’re sitting here, why don’t you do that?”

_E and CS enter Room A._

_CS to witness (take notes when witness responds):_

“Could I get your name please? And your telephone number, in case we need to get back in touch with you?”

“You saw the person who took a camera out of one of these rooms?”
"Can you describe that person for me please?"
"Can you tell me anything else?... Apparently he/she thinks the only people who could have known about the camera have already been through here."

E: "Yes, and we've got pictures of all of them... I pulled out all the ones that are even close to how they described her/him..."

CS: "Let me see those." (Looks through them.)

"All right. This is a bit unusual, but I'm going to ask that you look at these pictures now." (Hands witness stack of photos.)

"Please identify the person that you saw... Which person is it?" (Write down the number chosen.)

CO-WITNESS CONDITION:

CS: "The other witness identified the same person."

EVIDENCE CONDITION:

CS to E: "What's this person's name? Do you have that information?"

E looks through list; gives name.

CS: "You know, I think he/she's been brought in for questioning before... I think it had to do with some things that were taken from one of the dorms."

ORDER OF THESE QUESTIONS VARIES:

CS: "OK. I just need to ask you a few more questions, just for my information."

1) "How confident are you that this is the person you saw with the camera, say, on a scale from one to ten, with ten being completely confident?"

2) "I'd like for you to look carefully at this photo and tell me how different is your memory of the person you saw from the person in this picture? Let's say, on a scale from one to ten, with one being not at all different, and ten being completely different."
CS: “Okay, thanks. That’s fine for now.”

E to participant: “Thanks. Why don’t you just wait here for a few more minutes. I won’t make you finish the experiment, but we better make sure the officer is finished before I let you go... And I’m still required to debrief you about the experiment anyway. It’ll just be a minute.”

After both participants have been questioned and CS has left, E escorts them back to the waiting room for the debriefing.

Finishing up:

1) Debrief.

2) Answer any questions.

3) Thank them and send them on their way.

After participants leave, CS gets materials from cubicles. On each response sheet, note:

- Date, time, condition
- T, E, CS name
- ID or photo number, confidence rating, difference (similarity) rating
- Gender of participant
### APPENDIX E: ANOVA TABLE

*Analysis of Variance for Confidence and Ecphoric Similarity*

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* $p < .05$