SEQUENTIAL LINEUPS REDUCE UNCONSCIOUS TRANSFERENCE AND MISTAKEN LINEUP IDENTIFICATION: BUT AT WHAT COST?

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ABSTRACT

Adult participants were shown one of two versions of a video portraying a theft. In the transference condition the video contained a scene with the bystander. The control condition did not have the bystander, but another person in his place. In Experiment 1 participants in both conditions were shown a sequential bystander present culprit absent lineup. Transference participants were significantly more likely to misidentify the bystander as the thief than control participants, an effect that was small in magnitude when compared to previous studies. Experiment 2 used the same materials and procedures, except the bystander was replaced in the lineup with the thief. Sequential lineups decreased the rate of correct identifications when compared to previous studies that used simultaneous lineups. The results from Experiments 1 and 2 demonstrated that sequential lineups reduced the size of the unconscious transference effect, but also reduced the rate of positive identification of the thief.
DEDICATION

To my wife, friends, family, advisor, and fellow lab mates for their support and encouragement throughout the thesis process. You have been an unending source of encouragement, joy, love, and friendship. I dedicate this thesis to all the times we have had, and the times that we will have.
ACKNOWLEDGEMENTS

This thesis would not have been possible without the support of my advisor Dr. David Ross, who encouraged me to achieve my goals, and always go for nothing short of my best. I will try to repay you for your kindness and dedication by furthering my work in the field of Forensic Psychology. You have helped me not only become a better academic and researcher, but a better person as well. I would also like to thank Dr. Ayme Warren for her belief in my abilities, and for her advice. I appreciate all you have done, and will do my best to pay the favors forward. I am very thankful for Christopher Silver who encouraged and pushed me to meet my goals head on. I am also very thankful for Dominic Atkinson, whose aid made the goal of having 400 data points collected a reality. I would like to thank the rest of my friends and family for being a sympathetic ear, and a kind heart. Lastly, but first in my heart, I acknowledge, and am very thankful for my wife Ashford whose support in times of feast and famine kept me on my true path.
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4. Thief Present Bystander Absent Lineup Selection by Simultaneous versus Sequential Lineup Studies ...............................................................................................................18
Mistaken identification is the single greatest cause of wrongful convictions in the American legal system (Borchard, 1932). To date the Innocence Project has identified 302 individuals who were wrongfully convicted of crimes, and 75% of these cases involved mistaken lineup identification (Innocence Project, 2012). To address this problem the Department of Justice, the International Association of Chiefs of Police, and the American Bar Association have each published guidelines for law enforcement on how to properly collect identification evidence with the goal of increasing witness accuracy and decreasing wrongful convictions.

Background

Unconscious Transference

The present study is designed to improve lineup identification accuracy by reducing if not eliminating unconscious transference, a memory error that occurs when a witness misidentifies a familiar but innocent person from a police lineup. Unconscious Transference was defined by Read, Tollestrup, Hattersley, McFadzen, and Christensen (1990) as “the transfer of one person’s identity to that of another person from a different setting, time, or context” (pg.3). Ross Ceci, Dunning, and Toglia (1994) argued that the mechanism underlying unconscious transference is a process called “conscious inference,” when a witness incorrectly infers that a perpetrator and a familiar but innocent individual are the same person seen in two different
places. This process involves a failure in perceptual discrimination, erroneous inferential processing, and applying inaccurate contextual tags on previously encountered individuals. Several authors have recently argued that these types of memory errors are indicative of “change blindness.” Witnesses fail to notice changes and events in the environment that lead to erroneous information processing, the formation of inaccurate composite memories, and lineup identification errors (Davis, Loftus, Vanous & Cucciare, 2008; Davies & Hine, 2007; Nelson, Laney, Fowler, Knowles, Davis & Loftus, 2011).

Real world cases can further help illuminate how unconscious transference occurs. For example, Loftus (1976) describes a case where a ticket agent at a railroad station was robbed and later misidentified a sailor from a police lineup. Fortunately for the sailor, he had an ironclad alibi. It was later discovered that the ticket agent had sold the sailor tickets on several occasions prior to the robbery. Therefore the sailor was familiar to the ticket agent, and was seen in the same context where the crime occurred, creating the ideal conditions for unconscious transference to occur.

Studies on unconscious transference have mostly used the same experimental design. Participants are exposed to a staged crime either live or on videotape. Participants assigned to the transference condition are exposed to a familiar bystander seen before or after the crime. Participants assigned to the control condition see the same crime as the transference participants, but are not exposed to the familiar bystander. The research question is whether participants in the transference condition are more likely to misidentify the bystander when compared with participants in the control condition. Using this design, studies of unconscious transference have produced every possible pattern of results. Some studies have found support for the effect (Buckhout, 1974; Davis et al., 2008; Loftus, 1976; Read et al., 1990 Experiment 5; Ross et al.,
1994; Ross et al., 2006; Ross, Benton, & McDonnell, 2009), while other studies have found no
support for it (Dysart, Lindsay, Hammond, and Dupuis, 2001; Read et al., 1990—Experiments 1-
4; Geiselman, Haghghi, and Stown, 1996; Geiselman, MacArthur, and Meervitch, 1993), and
yet another study (Read et al., 1990; Experiment 2) has found a reverse unconscious transference
effect. For example, Read et al. (1990), in their second experiment, found that participants in the
transference condition were less likely than control participants to misidentify a familiar but
innocent lineup foil. Participants in the transference condition recognized the familiar foil but
identified him as an innocent bystander and quickly eliminated him as lineup choice.

In a series of large scale studies Ross et al. (1994; 2006; 2009) have identified boundary
conditions that impact the presence or absence of the unconscious transference effect. For
example, Ross et al. (1994) had adult participants watch a videotape about preschool teaching.
The videotape showed children interacting with teachers, and at the end of the videotape a
female teacher was shown going into a cafeteria where she places her purse on a table and turns
her back to get a drink from a vending machine. While getting her drink a man is shown taking
money from her wallet and placing it back on the table. All of the participants saw the same film,
except participants in the transference condition also saw a male preschool teacher reading a
story to a group of children. Participants in the control condition saw the same film but did not
see the male preschool teacher. When shown a lineup that contained the innocent bystander that
was shown reading in the preschool, 60.9% of the transference participants misidentified the
familiar but innocent bystander compared to 20.4% of the control participants. Moreover, the
majority of the transference participants who misidentified the familiar bystander thought he and
the thief were the same person seen in two different places, a process Ross et al. (1994) called
conscious inferencing.
Additionally, Ross et al. (1994, Experiments 2-4; 2006; 2009) demonstrated that the unconscious transference effect can be eliminated if: 1) transference participants are told just prior to seeing a lineup that the male preschool teacher and the thief are two different individuals, 2) if transference participants are shown a lineup that contains the thief and the bystander – thus transference participants can distinguish the two individuals if they are seen together; 3) if the participants in study are young (5-10 years of age) or elderly (70 years of age or older). The first two conditions described above fall under the category of what is referred to in the literature as “system” variables. These are under direct control of the legal system and impact the accuracy of lineup identification, such as the instructions that are provided to the witness. The last variable, witness age, is an “estimator” variable, which is not under control of the legal system but can have a direct impact on unconscious transference. These include witness experience factors such as stress and weapon focus, and also witness characteristics such as witness age.

In two large scale studies, Ross et al. (2006; 2009) studied the impact of witness age on unconscious transference. Ross et al. (2006) studied children from 5-12 years of age, and used the same procedures described above and found an inverse developmental susceptibility to unconscious transference. Specifically, unconscious transference was not present in children from 5-10 years of age, meaning that among children in this age range, participants in the transference condition were no more likely to misidentify the familiar but innocent bystander as compared with children in the control condition. However, there was an unconscious transference effect found in children aged 11-12 years old. It was found that 11-12 year-olds in the transference condition reasoned much like adults in the Ross et al. (1994) study, and when they misidentified the familiar bystander they incorrectly inferred that the bystander and the thief
were the same person seen in two different places. This error did not occur with younger children in the transference condition. Therefore, it appears that the unconscious transference effect emerges in children at approximately 11-12 years of age along with the ability engage in conscious inferencing.

At the other end of the age spectrum, Ross et al. (2009) used the same procedure as described in Ross et al. (1994; 2006), and found that participants from 40-70 years of age exhibited unconscious transference in a manner similar to that seen above in young adults (Ross et al., 1994), and 11-12 year old children (Ross et al., 2006). Specifically, transference participants were more likely to misidentify the bystander as compared to control participants, and to engage in conscious inferencing. Unconscious transference was not found in the 71-90 year old participants, nor did the transference participants in this age group engage in conscious inferencing.

In this series of studies (Ross et al., 1994; 2006; 2009) conscious inferencing was found to be critical in making the unconscious transference error. Young children aged 5-10 did not make the unconscious transference error, because it appears that they were unable to engage in conscious inferencing. The elderly participants had apparently lost the ability to engage in conscious inferencing, thus an unconscious transference effect was not seen in that age group. Therefore young children and the elderly are not susceptible to unconscious transference, because they lack or have lost the cognitive perquisites needed to make the error.

Sequential Lineups Eliminate Unconscious Transference: Fact or Fiction?

In all of the unconscious transference studies reviewed above, participants were presented with a simultaneous lineup. This involves showing participants a lineup that contains all the
photographs displayed in a single array. Simultaneous lineup encourages witnesses to use a process of elimination strategy where the witness compares all combinations of photographs and selects the best fit from the array. A process of elimination strategy promotes unconscious transference error, because the bystander is the only person in the array that is familiar. This person often appears more similar to the perpetrator than any other lineup member. Therefore the bystander can easily emerge as the best choice in the lineup based on his familiarity and similarity to the perpetrator. One possible remedy to this problem is to use a sequential lineup where the participant is shown one photograph at a time. The witness can accept or reject each photograph, but once a photograph is identified as “not the perpetrator” the witness is not allowed to return to a previously seen photograph. As will be seen below, the sequential lineup prevents witnesses from using a process of elimination strategy, because each photograph is viewed individually. It encourages the witness to use an absolute memory process whereby he/she compares each photograph with his or her memory of the perpetrator.

Compared with simultaneous lineups, sequential lineups have been found to dramatically decrease rates of false identification in perpetrator absent lineups. However, in some studies the superiority of the sequential lineup has come at the cost of reducing the rate of positive or correct identifications of the perpetrator (Lindsay & Wells, 1985; Lindsay, et al., 1991a; Lindsay, Lea, & Fulford 1991b; Sporer, 1993; Cutler & Penrod, 1988; Steblay, Dysart, Fulero, & Lindsay, 2001; MacLin, Zimmerman & Malpass, 2005; Steblay, Dysart, & Wells, 2011). The primary purpose of the present study is to determine if using a sequential lineup reduces or eliminates unconscious transference. This should occur because: 1) A sequential lineup should reduce the use of a process of elimination strategy, and increase absolute judgments; 2) Participants should become more selective in making an identification because they are more willing to “wait” for a
best match, and subsequently run out of lineup foils because he/she is not told how many photographs will be shown, and he/she is not allowed to go back and select a photograph that was previously seen (Steblay et al., 2011).

Hypothesis 1

If sequential lineups reduce or eliminate unconscious transference, then participants in the transference and control condition should misidentify the familiar bystander at or near the same rate. Conversely, with a simultaneous lineup, transference participants should be significantly more likely than control participants to misidentify the familiar bystander. To test this hypothesis, we will compare the size of the unconscious transference effect found in the present study using a sequential lineup, with that found in previous research by Ross et al. (1994; 2006; 2009) who used the same procedure but with a simultaneous lineup.
CHAPTER II

STUDY ONE

Methods

Participants

A sample of 200 undergraduate students participated in the study. The participants ranged in age from 18 to 38 years ($M = 19.47$), and the sample was 21% male and 79% female. The ethnic composition of the sample was 84% Caucasian/White participants, 9.5% African American/Black participants, 2% Hispanic/Latino participants, and 4.5% Asian-Pacific Islander. Each participant received extra credit for his/her participation in the study.

Materials

Each participant was seated at a desk with a flat panel computer monitor placed within with a transparent viewport. The viewport was covered in tinted glass that allowed the participant to view the monitor without glare. Visors covered the glass to prevent the participants from being able to see other screens. The film was projected on a screen that was $5\frac{3}{4}$ ft. wide by 6 ft. tall. E-Prime 1.2 was used to present the lineup photographs and to measure the reaction times of participants and to collect context and demographic data (Psychology Software Tools, Inc., 2002a; 2002b).
E-Prime

E-Studio (the programming aspect of E-Prime), was used to write the program that displayed the lineup and questions. It was also used to record the participant responses (Schneider, Eschman, & Zuccolotto, 2002a; 2002b). Participants used the program to perform the sequential lineup identification task, respond to context questions, demographic questions, a word association task, and perform a series of Equation Analysis Tasks. The entire session took an estimated average of 35 minutes to complete.

Stimulus Film

The stimulus film, procedure, and lineups in the present study were the same as used by Ross, et al. (1994; 2006; 2007; 2009). The film portrayed the “Day in the Life of a Preschool Teacher” and displayed teachers interacting with children in a preschool setting. The film consisted of ten different segments that ranged from 30 to 90 seconds long each. In each of these segments preschool teachers were shown interacting with children. The films shown to the subjects in the transference and control conditions were the same except for one segment where a teacher is shown reading a story to the children. In the transference condition a male is shown reading the story to the children, and that person serves as the familiar but innocent bystander that is later presented in the lineup. In the control condition, a female teacher reads a story to the children. All other aspects of the films shown to the transference and control participants were identical. The theft and bystander segments were each 34 seconds long, with the same amount of exposure of both the thief and the bystander.

Near the end of the film, the victim told another teacher that she was going to take a break in the cafeteria. The teacher then walked into the cafeteria and sat down at a table with the
thief (male). She then removed her wallet from her purse and took out a one-dollar bill. After that she placed her wallet on the table, got up, and walked to a vending machine with her back to the assailant. While the victim’s back was turned, the thief picked up the victim’s wallet, and removed the remaining money. He then placed the wallet back on the table, placed the money in his pocket, and left while the teacher was still at the vending machine with her back to him. The film ends when the thief left the room. The screen then faded to black ending the film. The participants were informed that deception was used, and that the study was actually about eyewitness memory and not preschool education.

*Lineup Construction*

Six lineup photos of equal shape and style, or “mugshots” as known in the vernacular, of persons were scanned and placed within the E-Prime program, and used in the study. The lineup was the same used by Ross et al. (1994; 2006; 2007; 2009) and were constructed so that the bystander is more similar to the thief than any other foil in the lineup which Ross et al. (1994; 2006; 2007; 2009) posits is a necessary condition for unconscious transference to occur. The photographs were color head and shoulder shots taken by a professional photographer, and were identical in lighting source, brightness, background, clothing, and distance from the camera.

Ross et al. (1994) constructed their lineup by recruiting participants (76 college students) to compare 47 pairs of color photographs of men with similar physical characteristics (20 to 25 years old; black or dark brown hair). Subjects were shown 47 pairs of photographs in which the photograph on the subject’s left was that of the person who played the thief in the film, and the photograph on the right was that of a potential lineup foil. Subjects were then asked to rate the similarity of each foil, and the bystander, to the thief. These foils were rated on a 7 point likert
scale format (1 = not at all similar, 4 = moderately similar, and 7 = very similar), and the mean level of similarity between each foil and the thief was calculated. The lineup consists of 4 foils, 1 bystander, and the thief. The four foils that are in the lineup fell around the median for the whole 47 foils shown, their means range from 2.48 to 2.65 meaning that they range from no, to moderate similarity to the thief (the point of comparison). The bystander had a mean rating of 3.97 indicating that he was seen as being more similar to the thief than the other foils selected. This procedure satisfied the requirement to create a lineup where the innocent bystander is more similar to the thief than any other foil in the lineup.

Procedure

Students were recruited to participate in a study on “Preschool Education,” and were offered extra credit for their participation, or consideration of participation. Participants were run in groups no larger than 10, and were seated at preselected numbered spaces in a computer lab. Subjects were randomized in a block randomized design such that all the participants in a given session saw the same video condition. At the beginning of the sessions the participants were told that they were about to participate in a study about psychology and education. The participants were asked to take a seat at one of the ten computer desks and were informed by the experimenter that the study was focused on ways to attract people to a career in preschool teaching. They were then told that they will see a video as a part of this study, and will be asked to give their opinions and reactions to the film. Before the film was started the participants were asked to fill out the informed consent (Appendix A). Both versions of the film (transference and control) lasted 4 minutes 5 seconds, and depending on the lineup condition to which they had
been assigned (bystander only or thief only) participants would either see the transference video (bystander and thief are present in the video), or the control video (only the thief is present).

After seeing the video (either transference or control) participants were informed of the true nature of the study and asked to participate in the lineup portion of the study. The subjects were informed that they would be seeing a series of faces one at a time on their computer. They were instructed that they were to try to identify the thief who stole the money from the wallet or indicate that the thief was not in the series of faces. Subjects were also told that they could not go back and look at previously seen faces once they had answered yes, or no to a face.

Additionally, participants were informed that the person who stole the money may or may not be in the series of faces that they would see. Each face appeared on the screen in sequence, and the program would only move on to the next face when the participant answered with one of the only two buttons the program allowed (1 = no and 2 = yes). After they answered yes or no for each face they were also asked to rate their confidence in their decision on a 7 point likert scale (1 = Not at all Confident; 4 = Moderately Confident; 7 = Extremely Confident). After the participants were done with the lineup portion of the study, they were asked to answer a series of context and demographic questions. The context questions asked about specifics in the film and the lineup task (Appendix D). The first four questions represented automatic recognition choices, and the remaining items questioned the participants about several details in the video. These context questions helped determine the reasoning behind the bystander misidentifications. The demographic questions asked the participant to supply information regarding their age, sex/gender, handedness, race/ethnicity, their education level, their parents’ education level (one at a time), current occupation, first language, eyesight, caffeine intake, and amount of sleep prior to participating in this study (Appendix C). After the participants completed the context and
demographic questions they completed, or attempted to complete a series of word association tasks modified from Bennett-Day (2007) (Appendix E), and a series of Equation Analysis Tests (Shortz, 1981) to keep them busy (Appendix F), so they would not engage in behavior that would distract others. After the participants completed the tasks they were debriefed, and thanked for their participation. The procedure as carried out by the researchers is in Appendix B.

Results

Does using a sequential lineup reduce unconscious transference? According to our study, the answer is yes. Unconscious transference was dramatically reduced, but not eliminated, when a sequential lineup was used. As seen in Table 1, 17% of the participants in the transference condition misidentified the familiar bystander as compared with 9% of the control participants. A z-test performed on the proportion revealed a marginally significant effect of the experimental condition ($z = 1.7$, $p = .09$ (two-tailed), and $p = .04$ (one tailed)). As seen in Table 2, the small unconscious transference effect found with the sequential lineup is 3-4 times smaller than that found with the simultaneous lineups used in past research by Ross et al. (1994; 2006; 2009) with college age adults (Ross et al, 1994), 11-12 year old children (Ross et al., 2006), and adults aged 40-70 (Ross et al., 2009).

Table 1  Bystander Present Thief Absent  Lineup Selection by Condition

<table>
<thead>
<tr>
<th></th>
<th>Foil (%)</th>
<th>Bystander (%)</th>
<th>Not In Lineup (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transference</td>
<td>15</td>
<td>17‡</td>
<td>68</td>
</tr>
<tr>
<td>Control</td>
<td>14</td>
<td>9</td>
<td>77</td>
</tr>
</tbody>
</table>

‡ (z test on proportion, $p = .09$ two tailed, $p = .04$, one tailed)
The majority of the participants in the Transference (68%) and Control (77%) condition who were presented with the sequential lineup, did not make an identification suggesting that they were either making a correct rejection, or they were waiting for a best “match” to the thief but ran out of lineup photographs, because they did not know how many photographs were going to be shown nor could they go back and select a previously seen photograph. This reduction in bystander identification clearly reduced the size of the unconscious transference effect.

The size of the unconscious transference effect is much smaller than in previous studies by Ross et al. (1994; 2006; 2009) that used the same procedure but with a simultaneous lineup with a combined sample of approximately 2000 participants (Table 2). In the present study, there was an 8% difference between the percentage of transference versus control participants who misidentified the bystander when shown a sequential lineup (Transference 17% - Control 9%). This is smaller than the difference found in Ross et al. (1994; 39%) for participants of the same age, but who were shown a simultaneous lineup (Transference 60.9% - Control 21.9%).

The unconscious transference effect was dramatically reduced when a sequential lineup, versus a simultaneous lineup, was used. Did this reduction come at a cost of reducing correct positive identifications of the thief when shown a bystander absent thief present lineup? This question is addressed in Experiment 2, uses the same procedure as Experiment 1 with the exception of using a sequential lineup that contains the thief without the bystander.
Table 2  Bystander Present Thief Absent Lineup Selection by Sequential versus Simultaneous Lineup Studies

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mean 18.2 yrs.</td>
<td>11-12 yrs.</td>
<td>50-60 yrs.</td>
<td>61-70 yrs.</td>
<td>Mean 19.5 yrs.</td>
</tr>
<tr>
<td>Transference</td>
<td>60.9%*</td>
<td>64% *</td>
<td>45%*</td>
<td>35%*</td>
<td>17% ‡</td>
</tr>
<tr>
<td>Control</td>
<td>21.9%</td>
<td>40%</td>
<td>24%</td>
<td>19%</td>
<td>9%</td>
</tr>
</tbody>
</table>

*p < .05 (z test on proportion)
‡ (z test on proportion, p = .09 two tailed, p = .04, one tailed)
CHAPTER III
STUDY TWO

Introduction and Hypothesis

In Experiment 1, the unconscious transference effect was reduced, but not eliminated, by the sequential lineup. To determine if there is a cost to using the sequential lineup, Experiment 2 was done using the same procedure as Experiment 1, except transference and control participants were shown a bystander absent, thief present lineup. We will compare the rate of correct positive identifications found in the present study with those obtained by Ross et al. (1994; 2006; 2009) that used the same procedure, but with a simultaneous lineup. If there is a cost to using the sequential lineup, participants in the transference and control conditions should be less likely to identify the thief when shown a sequential versus a simultaneous lineup.

Methods

Participants

A sample of 200 undergraduate students participated in the study. The participants ranged in age from 18 to 57 years ($M = 20.8$), and the gender composition of the sample was 21% male and 79% female. The ethnic composition of the sample was 75% Caucasian/White participants, 19% African American/Black participants, 2% Hispanic/Latino participants, 4% Asian-Pacific Islander participants. Participants were given extra credit for participation in the study.
Materials and Procedures

The materials and procedures from Experiment 1 were used with Experiment 2 with the exception that the bystander was removed from the lineup and replaced with the thief. Experiments 1 and 2 were identical in all other aspects except that the thief was present and the familiar bystander was absent from the lineup.

Results

Does using a sequential lineup to reduce unconscious transference come at the cost of reducing positive identifications of the thief? According to this study, the answer is yes. As seen in Table 3, the rate of positive thief identification was low in both conditions when a sequential lineup is used (Transference = 22%, Control = 28%). Moreover, the majority of the participants indicated “Not in lineup” by not selecting anyone in the lineup (Transference = 60%, Control = 61%), suggesting that the participants were waiting for a better match to thief before making an identification, but ran out of lineup photos.

As seen in Table 4, the rate of positive identification of the thief found in the present study using a sequential lineup is much lower (Transference = 22%, Control = 28%) than that found in previous research by Ross et al. (1994; 2006; 2009) using a simultaneous lineup (Transference = 75.0%, Control = 63.9%). These results indicate that using the sequential lineup dramatically reduced both the occurrence of unconscious transference and correct or positive identifications of the thief.
Table 3 Thief Present Bystander Absent Lineup Selection by Condition

<table>
<thead>
<tr>
<th></th>
<th>Foil (%)</th>
<th>Thief (%)</th>
<th>Not In Lineup (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transference</td>
<td>18%</td>
<td>22%</td>
<td>60%</td>
</tr>
<tr>
<td>Control</td>
<td>11%</td>
<td>28%</td>
<td>61%</td>
</tr>
</tbody>
</table>

Table 4 Thief Present Bystander Absent Lineup Selection by Simultaneous versus Sequential Lineup Studies

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Age</td>
<td>Mean 18.2 yrs.</td>
<td>11-12 yrs.</td>
<td>51-60 yrs.</td>
<td>61-70 yrs.</td>
<td>Mean 20.8 yrs.</td>
</tr>
<tr>
<td>Transference</td>
<td>75.0%*</td>
<td>N/A</td>
<td>40.7%*</td>
<td>35.3%*</td>
<td>22%</td>
</tr>
<tr>
<td>Control</td>
<td>63.9%</td>
<td>89.0%</td>
<td>46.5%</td>
<td>48.8%</td>
<td>28%</td>
</tr>
</tbody>
</table>

*p < .05 (z test on proportion)
CHAPTER IV
GENERAL DISCUSSION AND CONCLUSION

To our knowledge, this study is the first test of whether a sequential lineup can reduce or eliminate unconscious transference. In Experiment 1, the sequential lineup dramatically reduced, but did not completely eliminate, the unconscious transference effect. Compared with previous research by Ross et al. (1994; 2006; 2009) that used a simultaneous lineup, the size of the unconscious transference effect with the sequential lineup was substantially smaller. The superiority of the sequential lineup, however, came at a very high cost. As seen in Experiment 2, the sequential lineup dramatically reduced the rate of correct positive identification of the thief as compared with the findings by Ross et al. (1994; 2006; 2009). The high rate of not “in lineup selections” in Experiments 1 and 2 may be indicative of participants not being able to engage in a process of elimination strategy, which may have prevented them from making an identification. Additionally, participants in Experiments 1 and 2, may have simply waited too long to make an identification and ran out of photographs due to an increase in selection criteria or waiting for the best match, especially when the participants were unaware of the number of photographs that were available to view (Ebbesen & Flowe, 2002; Palmer & Brewer, 2012; Steblay, et al., 2011).

One direction for future research is to replicate Experiments 1 and 2 with a sequential lineup using the same restriction that participants cannot go back to previously seen photographs, but they are told how many photographs exist in the entire array. This may eliminate an increase in selection criteria or the “waiting” response. Therefore participants should be significantly
more likely to make a lineup identification as they approach photographs toward the end of the array. Given that the familiar bystander was shown fourth in a sequence of five individuals, knowing that only one more photograph will be shown when the bystander is seen, may result in a significant increase in bystander misidentifications and correct identifications when participants are shown a bystander absent-thief present lineup. This manipulation was done in a study by Lindsay, Lea, & Fulford (1991) who had participants witness a staged crime, were shown a sequential lineup, and then were either informed or not informed of the number of photographs to be viewed. Participants in the informed condition were significantly more likely to misidentify a foil as compared with participants in the uninformed condition. The foils used in the study, however, were unfamiliar to the participants. Therefore it remains unknown what would occur if the present study were replicated using the informed versus uninformed manipulation as done in the study by Lindsay et al. (1991).

Future research could also examine whether the Cognitive Interview may reduce or eliminate the unconscious transference effect. The Cognitive Interview is a procedure that is designed to increase the amount of accurate information recalled by a witness using a series of memory instructions that serve as a cue to memory retrieval. Several researchers have used the mental reconstruction portion of the cognitive interview to increase lineup identification accuracy. Malpass and Devine (1981) and Culter, Penrod, and Martens (1987) found that participants that were given a context reinstatement instruction to visualize the face of the perpetrator and the crime scene were significantly more likely to correctly identify the perpetrator as compared with control participants. Future research could examine whether a context reinstatement instruction could reduce or eliminate unconscious transference effects.
Despite this study being the first to examine the effect of the sequential lineup on the unconscious transference, the study is not without limitations. First, this study was conducted in a laboratory thus the findings lack ecological validity. Participants were not exposed to high levels of stress when viewing the crime or when making the lineup identification. Second, the present study did not include a transference and control condition with both the thief and bystander present lineup. Rather the findings from the present study were compared with those found by Ross et al. (1994, 2006; 2009). While we are confident that this comparison is justified given that we used the same design as done by Ross et al. (1994, 2006; 2009) that include nearly 2000 participants ranging from 5-90 years of age, there is a consideration that the previous studies were conducted with different cohorts.

Conclusion

The unconscious transference effect is a serious problem that can lead to eyewitness misidentifications. The present study examined whether utilizing another lineup method, known for decreasing false identification, would reduce or eliminate the unconscious transference effect. The present study also examined whether or not utilizing this lineup method would have an effect on the eyewitnesses’ ability to correctly identify the culprit. We found that there was indeed a reduction in the misidentification of the familiar bystander when using the sequential lineup, and that reduction came at the cost of correct identifications of the thief. The findings in the present study have implications for future research, as well for law enforcement who work in applied settings. Many states are using the sequential lineup as a means to improve the accuracy of lineup identifications. However, the findings above provide a stark reminder that the sequential method is not perfect and could aid in misdirecting investigators’ efforts to solve a
crime. It is important to consider that people are prone to error, and that even the best eyewitnesses can make mistakes. The results of the present study show that while there are new and effective techniques to combat eyewitness misidentification, there are possible unintended negative consequences as well. It has become apparent that controlling system variables has become a balancing act, and that further study is needed before researchers can unequivocally say that one method is indeed better than the other. The present study is another illustration of the need to continue the search for innovative methods that can be used to improve the accuracy of eyewitness testimony. There is not, as of yet, a perfect method of controlling for eyewitness errors, but as research and innovation continue, there is hope.
REFERENCES


APPENDIX A

INFORMED CONSENT
PROTOCOL TITLE: “A Day in the Life of a Preschool Teacher”

UNIVERSITY OF TENNESSEE AT CHATTANOOGA

Please read this consent document carefully before you decide to participate in this study. This research has been approved by the University Institutional Review Board.

Purpose of the research study:

The purpose of this study is to show you a videotape about preschool education and to assess your thoughts and reactions to it.

What you will be asked to do in the study:

You will be asked to watch a video about preschool teaching, and give your opinions and reactions to the video.

Time required:

1 hour

Risks and Benefits:

There are no inherent risks involved with participating in this project. However, information from this study may benefit many in the future.

Confidentiality:

Your responses to any questions during the study asked are entirely confidential. Your name does not appear anywhere on the questionnaire, and you are not being evaluated in any way.

Voluntary participation:

Your participation in this study is completely voluntary.

Right to withdraw from the study:

You have the right to withdraw from the study at anytime without any penalty.

Whom to contact if you have questions about the study:

Dr. David Ross (David-Ross@utc.edu)

Paul Rosenberg (Paul-Rosenberg@utc.edu)

Agreement:
I have read this form and I agree to participate in the aforementioned procedure. I acknowledge that I have received a copy of this informed consent.

Participant: ____________________________________ Date: _________________

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact Dr. Bart Weathington, Chair of the Institutional Review Board, at 423-425-4289. Additional contact information is available at www.utc.edu/irb
APPENDIX B

PROCEDURE
Sequential Lineup Procedures

Before Students Arrive
1. Make sure you have Flashdrive for your condition.
2. Obtain the Projector, Computer, Speakers, and the Direction Signs from the MPS Office.
3. Post the Signs in their designated spots.
4. Set up the portable projector, laptop, and speakers in their designated spots (as marked by the tape (ex. Left Speaker on the tape with L Sp on it, and the Right Speaker on the R Sp labeled tape) and be sure to lineup the tape on the bottom of the projector with the tape labeled projector on the front left most desk.).
5. Make sure that the projector’s legs are extended fully so that the top of the front part of the projector is roughly 5 inches from the desktop.
6. Make sure that both the computer’s volume settings, and the speakers’ volume settings are at max.
7. Pull down the projector screen in the front of the room. (Holt 349 B)
8. Have the portable projector, laptop, and speakers on, connected, and ready.
9. Place the DVD in the computer, and be sure that the program is ready.
10. Make sure that all of the numbered student station computers are turned on
11. Open up the E-Run Program by clicking on the Start Menu/Programs List
12. Then click File, and Open
13. Select the Scripts File on the M Drive.
14. Select the Condition you have been selected to Run
15. Open it, and select RUN (can press F7)
16. Do this to all the computers.
17. If there are any missing labels then please, label the Computers that Students will be assigned to.
   (Labels will be provided) This is their subject number.
18. Enter in the Required information when you open up the program (ex. Researcher Name, etc…)
19. Make sure that all of the glass shields above the computer screens are clean. If not, then clean them. (Materials will be in the MPS office, or in the desk at the front of the room in the side compartment.)
20. Turn off your cell phone.
21. Make sure the blinds are down, and no natural light can get in. If the blinds are not down pull them down.
22. Place the do not disturb sign on the Holt 349 B Door facing the 349 Hallway entrance.
23. When all 10 of the student participants are in their seats, close the door.

(Read this as they are coming in to 349 B)

– Please have a seat, and do not touch the computers until instructed otherwise.

(Wait until they are all seated to read the rest.)
Introduction
(READ THIS ALOUD)

Thank you for coming today. My name is ___________, and we appreciate your participation in our study. Today’s session will last about an hour and I would like you to please listen carefully to the instructions that I’m going to give you.

Once we start the study it is very important that you do not talk to anyone, turn off your cell phones, turn them over so the face is down and place them in the front of the screen cover at the front of the table. We cannot stop the experiment once it has started. Do not look at anyone’s computer screen because we are interested in your individual answers.

After we finish the study, we will tell you all about what we are doing and can answer all your questions.

Task at Hand

You are participating in a study on psychology and education conducted by Dr. David Ross at UTC. As part of this study, I am going to show you a short film about teaching young preschool children. As many of you may know, the number of people going into the teaching profession, especially at the preschool level, has dropped dramatically over the last several years. The film that I am going to show you is designed to be shown to college students in hopes of attracting them to a career in preschool teaching. It shows what the average day in the life of a preschool teacher looks like, and shows some of the rewards and benefits of being a teacher. So, what I would like to do is show you the film, and then get your opinion and reactions to it. The film is about 15 minutes long.

Do you have any questions so far?

Before we get started, there is a sheet of paper called an Informed Consent Form. As part of the normal process of being part of a study we need you to read over this form and sign it at the bottom. This means that you are volunteering to participate in our study. Be sure to fill out the top portion of the form. Please write the class information for the class you want to get extra credit in. Please turn it over once it has been completed.

I will be collecting them shortly.

Please DO NOT touch the computer until I give you further instructions.

Collect consent form after complete

(Get DVD ready to play—make sure to note what Condition is played. Insert disc into DVD drive. Window will pop up. When you are ready to start, click on ‘okay’. “A day in the life of a pre-school teacher” will show up. Click on word “play” beneath) Turn off lights when playing the DVD.
**Present Film**
--LET IT PLAY TO THE END!!!--

--ONCE ENDED PRESS THE POWER BUTTON ON THE PROJECTOR TWICE--

**After the Film**
(TURN ON LIGHTS)

As you can see by the crime at the end of the film, this study is not about education and preschool teaching. Instead, it is about eyewitness memory and your ability to recall the crime you have just seen. Our goal was to create as realistically as we could, a “crime” that you would observe without you knowing that it was going to happen. Now, I would like you to put yourself into the role of a real “eyewitness” and imagine that I’m a police detective who is asking you to describe your memory for the crime.

**Lineup Identification**

Now what I want to do is show you a series of photos of faces. I want you to try to identify the thief who stole the money from the wallet or indicate that the thief is NOT in the series of faces. You will view each face one at a time.

**You cannot go back and look at previously seen photographs once you have answered yes or no to a face! After you are done with the photos we ask a series of questions that cannot be returned to once completed.**

If you think the person who stole the money is NOT being shown, press the 1 key on the keyboard to indicate “NO”

If you think the person who stole the money IS being shown, press the 2 key on the keyboard to indicate “Yes”

After responding Yes or No to each face you will be asked to rate how confident you are in your response.

Finally, IF you have pressed “yes” for any face you are done with this portion of the study, and will not see anymore faces.

Please Remember, the person who stole the money may or may not be in the series of faces that you will see.

After you are done with looking at the faces the computer will ask you a series of questions, and then will be asked to complete a series of tasks after.

You can now begin. Please Press the Spacebar to start.
--NOTE: The experimenter should be watching and if they see, or are told that a participant made an error be sure to write the Subject Number, Session Number, and Date to allow the removal of that data from the set. Also be sure to put the Subject #, Session#, and Date on the Excel Spreadsheet located in Paul’s Thesis file in dropbox.--

**Debriefing**

As you know, this is a study of eyewitness memory. I regret having to deceive you about the purpose of the study earlier, but as you can see it is not possible to do this research without the use of some deception. I would like to thank you for participating in this research.

I must ask you to please not talk to other people about the experiment. As you can see, it is critical that people not be informed about the nature of the study prior to participating in it. Other people from the community have yet to participate, so please don’t tell them about the study. Can we agree to this? Thank you.

--NOTE: Experimenter writes down the video and lineup conditions run on their procedures sheet. They then sign and date the procedure sheet, and place it in Paul’s box, or in the MPS office. ---
APPENDIX C

DEMOGRAPHICS QUESTIONNAIRE
Demographic Questions

1. How Old Are You? Please type in your answer. Press ENTER when done/
   Possible Answers: (They type the response to this question)

2. Are You:
   M = Male
   F = Female
   O = Other

3. Which is your dominant hand?
   L = Left
   R = Right
   A = Ambidextrous

4. What is your race/ethnicity?
   4 = Caucasian / White
   5 = Caucasian / White Non-Hispanic
   6 = African American / Black
   7 = Hispanic / Latino
   8 = Asian-Pacific Islander
   9 = Native American / American Indian

5. Your Education Level is?
   1 = Less than Highschool
   2 = Highschool / GED
   3 = Some College
   4 = 2-Year College Degree (Associates)
   5 = 4-Year College Degree (BS,BA)
   6 = Master’s Degree
   7 = Doctoral Degree

6. Father’s Education Level
   1 = Less than Highschool
   2 = Highschool / GED
   3 = Some College
   4 = 2-Year College Degree (Associates)
   5 = 4-Year College Degree (BS,BA)
   6 = Master’s Degree
   7 = Doctoral Degree

7. Mother’s Education Level
   1 = Less than Highschool
   2 = Highschool / GED
   3 = Some College
   4 = 2-Year College Degree (Associates)
5=4-Year College Degree (BS,BA)
6=Master’s Degree
7=Doctoral Degree

8. What is your current occupation? Please type in your answer. (Press F7 when you are done)
   Possible Answers: (They type the response to this question)

9. What was your first language? Please type in your answer. (Press Enter when you are done)
   Possible Answers: (They type the response to this question)

10. Do you have corrected vision?
    1=Yes, Glasses
    2=Yes, Contacts
    3=Yes, Laser Surgery
    4=Yes, Other
    5=No

11. Do you drink or eat caffeinated food and/or drinks?
    Y=Yes
    N=No

12. Have you had caffeine in the last 24 hours?
    Y=Yes
    N=No

13. Which of these best describes your average consumption of caffeine?
    1=Once a week
    2=Twice a week
    3=Three times a week
    4=Four times a week
    5=Five times a week
    6=Six times a week
    7= Everyday

14. How many hours of sleep did you get last night? Please type in your answer. Press ENTER when you are done.
    Possible Answers: (They type the response to this question)
APPENDIX D

CONTEXT QUESTIONS
Context Questions

1. Is there any person in the lineup who was seen in the film, but was NOT the person who stole the money from the wallet?
   
   Possible Answers: 1=No   2=Yes   3=Don’t Know

2. If yes, what number does that person have in the lineup, and what was that person seen doing in the film? Please describe below. When you are done press the F7 key.
   
   Possible Answers: (They type the response to this question)

3. Was the robber seen in any place in the film other than in the cafeteria where the money was stolen?
   
   Possible Answers: 1=No   2=Yes   3=Don’t Know

4. If yes, where was the robber seen and what was he doing? Please describe below. When finished press the F7 key.
   
   Possible Answers: (They type the response to this question)

5. When you were shown each photograph and asked whether or not that person was the thief how did you make your decision? Please describe below. Press the F7 key when finished.
   
   Possible Answers: (They type the response to this question)

6. How many MALE preschool teachers, if any, were shown in the film? Provide a VERY BRIEF description of each, and state what they were doing. Please describe below. After you are finished press the F7 key.
   
   Possible Answers: (They type the response to this question)

7. Describe your memory of the robber. What did he look like? What type of clothing did he have on? (Give as much information as possible about the physical appearance of the robber.) Please describe below. Press the F7 key when you are done.
   
   Possible Answers: (They type the response to this question)

8. Describe your memory of the crime from the moment the victim entered the cafeteria until the end of the film. (Describe everything you can remember about the event (even seemingly unimportant details)). Please describe below. Press the F7 key when you are done.
   
   Possible Answers: (They type the response to this question)
APPENDIX E

FILLER VOCABULARY TASK
Instructions: Type in the word that relates to the first three.
Example: Salt; Deep; Foam
     Answer: Sea (Sea salt, deep sea, and sea foam)
Example 2: Rock; Times; Steel
     Answer: Hard (rock hard, hard times, and hard as steel)
Example 3: Falling; Actor; Dust
     Answer: Star (falling star, actors are referred to as stars, and stardust)

Here are yours to try. Some may be challenging, but please do your best.
1. Broken; Clear; Eye
   Possible Answers:  (They type the response to this question)

2. Widow; Bite; Monkey
   Possible Answers:  (They type the response to this question)

3. Cracker; Union; Rabbit
   Possible Answers:  (They type the response to this question)

4. Playing; Credit; Report
   Possible Answers:  (They type the response to this question)

5. Chamber; Staff; Box
   Possible Answers:  (They type the response to this question)

6. Ticket; Shop; Broker
   Possible Answers:  (They type the response to this question)

7. Walker; Main; Sweeper
   Possible Answers:  (They type the response to this question)

8. Speak; Money; Street
   Possible Answers:  (They type the response to this question)

9. Measure; Desk; Scotch
   Possible Answers:  (They type the response to this question)

10. Puss; Tart; Spoiled
    Possible Answers:  (They type the response to this question)
APPENDIX F

EQUATION ANALYSIS TASK
Equation Analysis Task

Instructions: Each equation below contains the initials of words that will make it correct. Find the missing words. Type in your answers. Press F7 when you are done with each equation.

Example: \(26 = \text{L. of the A.}\) \(\rightarrow 26 = \text{Letters of the Alphabet.}\)

(These will appear one per slide in E-Prime)

<table>
<thead>
<tr>
<th>Equation</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 = W. of the A.W.</td>
<td>Wonders of the Ancient World</td>
</tr>
<tr>
<td>1,001 = A.N.</td>
<td>Arabian Nights</td>
</tr>
<tr>
<td>12 = S. of the Z.</td>
<td>Signs of the Zodiac</td>
</tr>
<tr>
<td>54 = C. in a D. (with the J.)</td>
<td>Cards in a deck (with the jokers)</td>
</tr>
<tr>
<td>8 = P. in the S.S.</td>
<td>Planets in the solar system</td>
</tr>
<tr>
<td>88 = P.K.</td>
<td>Piano keys</td>
</tr>
<tr>
<td>13 = S. on the A.F.</td>
<td>Stripes on the American flag</td>
</tr>
<tr>
<td>32 = D.F. at which W.F.</td>
<td>Degrees Fahrenheit at which water freezes</td>
</tr>
<tr>
<td>18 = H. on a G.C.</td>
<td>Holes on a golf course</td>
</tr>
<tr>
<td>90 = D. in a R.A.</td>
<td>Degrees in a right angle</td>
</tr>
<tr>
<td>200 = D. for P.G. in M.</td>
<td>Dollars for passing “Go” in Monopoly</td>
</tr>
<tr>
<td>8 = S. on a S.S.</td>
<td>Sides on a stop sign</td>
</tr>
<tr>
<td>3 = B.M. (S.H.T.R.!)</td>
<td>Blind mice (See how they run!)</td>
</tr>
<tr>
<td>4 = Q. in a G.</td>
<td>Quarts in a gallon</td>
</tr>
<tr>
<td>24 = H. in a D.</td>
<td>Hours in a day</td>
</tr>
<tr>
<td>1 = W. on a U.</td>
<td>Wheel on a unicycle</td>
</tr>
<tr>
<td>5 = D. in a Z.C.</td>
<td>Digits in a ZIP code</td>
</tr>
<tr>
<td>57 = H. V.</td>
<td>Heinz varieties</td>
</tr>
<tr>
<td>11 = P. on a F.T.</td>
<td>Players on a football team</td>
</tr>
<tr>
<td>1,000 = W. that a P. is W.</td>
<td>Words that a picture is worth</td>
</tr>
<tr>
<td>29 = D. in F. in a L.Y.</td>
<td>Days in February in a leap year</td>
</tr>
<tr>
<td>64 = S. on a C.</td>
<td>Squares on a chessboard (or checkerboard)</td>
</tr>
<tr>
<td>40 = D. and N. of the G.F.</td>
<td>Days and nights of the Great Flood</td>
</tr>
</tbody>
</table>

Equations and Answers obtained from:
(http://www.gamesmagazine-online.com/gameslinks/EATanswers.html)
APPENDIX G

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER
MEMORANDUM

TO: Dr. David Ross
Paul Rosenberg

IRB # 12-085

FROM: Lindsay Pardue, Director of Research Integrity
Dr. Bart Weathington, IRB Committee Chair

DATE: March 21, 2012

SUBJECT: IRB # 12-085: The Impact of Sequential Lineups on Unconscious Transference in Lineup Identification

The Institutional Review Board has reviewed and approved your application and assigned you the IRB number listed above. You must include the following approval statement on research materials seen by participants and used in research reports:

The Institutional Review Board of the University of Tennessee at Chattanooga (FWA00004149) has approved this research project #12-085.

Please remember that you must complete a Certification for Changes, Annual Review, or Project Termination/Completion Form when the project is completed or provide an annual report if the project takes over one year to complete. The IRB Committee will make every effort to remind you prior to your anniversary date; however, it is your responsibility to ensure that this additional step is satisfied.

Please remember to contact the IRB Committee immediately and submit a new project proposal for review if significant changes occur in your research design or in any instruments used in conducting the study. You should also contact the IRB Committee immediately if you encounter any adverse effects during your project that pose a risk to your subjects.

For any additional information, please consult our web page http://www.utc.edu/irb or email instrb@utc.edu

Best wishes for a successful research project.
VITA

Paul Rosenberg is a Tennessee native who completed his Bachelor of Arts degree at the University of Tennessee Knoxville in Psychology. After graduation he worked at a dual diagnosis mental health facility for non-violent criminals as a technician in Florida. He then attended the University of Tennessee at Chattanooga to complete his Masters degree in Research Psychology under the supervision of Dr. David Ross. His interests are a combination of abnormal psychology, and psychology and the law. While at the University of Tennessee at Chattanooga he worked as a graduate advising editor for the undergraduate research publication Modern Psychological Studies. He also was an interviewer, and the logistical manager of the American half of an international research project studying Faith Development with Drs. Hood, Silver, and Streib.