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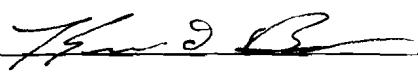
Abstract approved: 

This study investigated the effects of drawing a picture of the perpetrator on the eyewitness's testimony. One objective of this research was to investigate the accuracy of the use of adult's drawings in eyewitness testimony. Participants in this study were ninety college students ranging from freshmen to seniors who were enrolled in a beginning psychology course at Emporia State University. Participants were presented with a video containing a bike theft vignette. The participants were then divided into three groups. One third of the participants engaged in drawing a picture of the perpetrator using magic markers. One third spent some time thinking about the perpetrator. One third was given a puzzle to solve as a distractor task. After engaging in one of these three activities, all the participants completed a memory questionnaire regarding the perpetrator. It was expected that a significantly greater amount of elaboration and commissions would be reported for the group engaging in drawing a picture of the perpetrator than the groups who engaged in thinking about the perpetrator. It was also predicted that men would report more elaboration and be more accurate in their reporting than would women. Results indicated that men were more accurate than were women. Also, results indicate that those who engaged in puzzles had an increased rate of errors. Those who engaged in puzzles and those who drew committed a significantly greater number of commissions (reporting

details which were not actually present) than did those who engaged in thinking about the perpetrator. It can be concluded that engaging in an activity other than focusing on the perpetrator leads the participant to report more error and commissions.

AN EXAMINATION OF THE EFFECTS OF DRAWING ON MEMORY RECALL AND ACCURACY

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CHAPTER 1

INTRODUCTION

One of the most important topics addressed by forensic psychologists is the accuracy of eyewitness memories. Because the reliability of these memories varies considerably, a critical goal of research has been to identify the variables and procedures that increase the completeness and accuracy of eyewitness testimony. Researchers have made several advances in finding these variables and procedures, especially those that predict the accuracy of eyewitness identifications.

However, researchers were forced to investigate further due to the fact that the world is full of visual stimuli that are difficult for children and adults to describe in words. Researchers have turned their attention from the issue of accuracy to focus on the development of techniques to improve children's and adult's self-reports. Among the techniques explored so far are visual prompts, free recall, cognitive interviews and drawings (Miller, Fremouw, Aljazireh, & Parker, 1996; Bulter, Gross, & Hayne, 1995).

The objective of this research was to investigate the accuracy of the use of adult's drawings in eyewitness testimony. Drawings have been found to increase the amount of information reported by both children (Miller, et al., 1996; Bulter, et al., 1995) and adults (Miller, et al., 1996). Yet, due to the limited cognitive and physical abilities of children, accuracy is left up to verbalization of the children about their drawings. In spite of the advances in research regarding the use of art in eyewitness testimony, few studies have been conducted with adults using drawings to elicit information.

Statement of Problem

Researchers have conducted a limited amount of research to determine the effectiveness of drawing in increasing the amount of information adults report, the accuracy of this information, and the tendency for drawings to encourage a person to "fill in the gaps." "Filling in the gaps" or errors of commission in recall are defined as adding details to complete merely the drawing, even though the details are not known or remembered. This addition of details has been found with the use of imagery mnemonics (Bekerian & Dennett, 1997). Imagery mnemonics is similar to drawing because both include creating images of the situation. Adding details to complete the description has also been found when the original information is not well encoded. Wright and Stroud (1998) found that when given a scenario, a person will accept the information that he/she is given and then will fill in what he/she expects to happen or to be included. Differences have also been found between men and women in the amount of and types of details reported.

Statement of Purpose

The purpose of this study was to determine whether the use of drawings encourages adults to fill in the gaps in their memory just to make the drawing complete. This study addressed the amount of details added in the drawing to complete the picture which were not included in the verbal report. Also of interest was the difference between men and women in terms of the number of details they included merely to make the drawing complete. With such information, the legal system should be better able to

understand the issues it faces when using drawings, in addition to verbal description, to obtain information from witnesses.

Review of the Literature

Researchers have explored ways to increase the amount of verbal information that witnesses can recall and describe without decreasing their confidence and accuracy. Tversky (1997) stated that "Language does not capture all our experiences--not even all our visual or spacial experience" (p. 185). Researchers have also repeatedly found that mental images bear resemblances to pictures. Farah (1984) stated that drawing is a constructional task that is relevant to assessing imagery ability because drawing is related to the generation of mental images. Drawing requires the participants to generate an image in short term memory before they can correctly draw the image on paper. Thus, to aid in the recall and testimony of witnesses there has been an increased practice in the use of imaging, props, and drawing. The use of drawings in eyewitness testimony has been researched extensively with children, but little research has been done to examine the effects of drawings to elicit information from adults.

Schema

Generating an image in short term memory and drawing the image can be influenced by a person's schema. A schema is defined by Mayer (1992) as a "general knowledge structure in comprehension. A schema serves to select and organize incoming information into an integrated, meaningful framework." (p. 228) According to the schema theory, understanding involves the construction of a schema and the incorporation of new information to the schema. Kapardis (1997) stated that schema-based theories hold that

memory is subject to post-event contamination through assimilation and distortion over time. He believes based on his research that a person cannot access the original memory because it no longer exists, although parts of the original memory are preserved and can be recalled under the right circumstances. Thus, witnesses may call on their schemas in reporting details which they can not recall.

Thompson, Gibbons, Vogal, and Walker (1997) found that people use schematic information to piece together all kinds of information, from placing events in time to placing events in location and context. Remembering can be seen as a process of reconstructing the event. During recall, an existing schema is used to construct details that are consistent with the memory. Thus, people tend to report seeing what they expect to see, or desire or need to see and not what really happened. This can be influenced by a person's social schema, that is the person's mental representation of social categories or stereotypes. Schank (1982) proposed the concept of a "script," a special type of schema that organizes information relevant to a specific event or stereotyped activity. For example, a person trying to remember the face of a perpetrator will simply access the appropriate script and fill in the missing pieces from this script. This may affect the accuracy of the witness's report by causing the witness to report more commissions while trying to fill in the missing pieces of their memory.

Imaging, Props, Drawing and Memory

The use of visual imaging and props, including drawings, has been a widely accepted practice in clinical settings, yet is new to the field of eyewitness testimony. Recently, several studies have looked at the benefits of using drawings as opposed to

props (Butler, et al., 1995; Miller, et al., 1996). The majority of the research has been geared towards the use of art in eyewitness testimony with children ranging in age from 3-15 years of age. Butler, et al. (1995) list several reasons to use drawings to facilitate memory performance in children. These reasons have also been agreed upon by other researchers as positive reasons to use drawings in eyewitness testimony.

First, drawings require no training or practice and therefore may be a quick and efficient way to elicit a large amount of information from eyewitnesses. Miller, et al. (1996) found child participants recalled a significantly greater number of correct details during free recall following drawing than with the cognitive interview method.

Butler, et al. (1995) found that children who drew a picture about an event, a field trip to the fire station, before giving a verbal description were as accurate and reported more information than children who only verbally described the event. Saywitz, Snyder, and Lamphear (1990) found that on the average there were additional facts elicited as a function of using intervention, such as prompts, to prepare children for testimony. Of the facts that were elicited, ten percent were inaccurate. The errors tended to be focused around the physical appearance of the suspect and were limited to details regarding the clothing, jewelry, etc. of the person in question. Davison and Thomas (1999) found that the use of drawing resulted in a significantly lower amount of details recalled than when using only verbal description. They report that "these results demonstrate that drawing can inhibit young children's recall. Making a drawing is a complex cognitive process, as is the act of recall. It is possible that when these actions are carried out concurrently there is resulting interference which inhibits recall" (p. 4). Rawls (1996) also found that line

drawings resulted in a number of false positive errors (identify the perpetrator as having the specific characteristics when they do not) especially when children were repeatedly asked closed-ended questions (which start with could, can or will and can be answered with a yes or no response).

The second reason cited for using art as a tool in eyewitness testimony is that although props and models may be helpful in memory studies where the experimenter controls the situation, they may be more difficult for use in real, non-experimental situations. For example, when an interviewer does not know what happened, knowing what props or models to use with a child may be hard for the interviewer. However, the drawing allows the child to prompt or cue him/herself. With the drawings, the interviewer does not need to know what happened initially. Also the drawings allow the children to choose pieces of information that they consider interesting about the event. Butler, et al. (1995) conducted a study in which children participated in a real situation. The researchers then had children either tell or draw the event. They found that children who drew a picture of the events reported more information than those who verbally described the event. Butler, et al. also found that drawing allowed children to describe what seemed to be routine aspects of the events that they would not have normally included in the conversation. The drawings encouraged the children to use more details in their descriptions than did merely giving verbal descriptions.

Finally, researchers have indicated that children may provide a greater amount of information about events when the children initiated the retrieval of the event. It is thought that children can probably provide more of their own retrieval cues as they draw a

picture of what happened. Miller, et al. (1996) found that children recalled a significantly greater number of details during free recall proceeded by drawing/prop techniques. Butler, et al. (1995) found that drawing facilitated memory performance. Overall, children who drew reported twice as much information in the same amount of time as children who gave verbal descriptions. Burgess and Hartman (1993) found that children's drawings provide direction for recall and memory of events when used in the clinical interview (an analytical and highly objective type of interview). They acknowledged that "drawings encourage the retrieval of experience in the motor, visual, and auditory recall. The drawing itself gives an expression of motor sensory discharge; the objects in the drawing help with the perceptual cues that children remember; and the cognitive dimensions are represented in the organization, interpersonal patterns, and verbal discussion of the picture" (p. 161). Colbert (1984) examined both the graphic and verbal descriptive abilities of children and the relationships that exist between these abilities. He discovered that drawing tasks affected retention of details. When the children were asked about the event a week later, those who drew remembered more details than those who just verbally described the event.

Unlike with research using children, there are few investigations on the use of art in eyewitness testimony for adults. Miller, et al. (1996) found that college students recalled a significantly greater number of correct details during free recall following drawing/visual props than when interviewing without a drawing session. They also found that adults recalled significantly greater number of details during free recall proceeded by drawing or other techniques to increase performance such as props.

Gender and Memory

A number of studies have examined the gender differences in eyewitness testimony, especially criminal identification. Researchers have found that gender influences the kind, amount, and accuracy of details remembered or reported. Women have been found to be more accurate observers than men (Ellis, Shepherd, & Bruce, 1973; Marks, 1972; Yarmey & Jones, 1983). Yarmey and Jones (1983) reported that witnesses tend to observe same-sex persons more accurately than persons of the opposite sex. Ellis, et al. (1973) reported that women were better at face recognition than were men. The authors note that this superiority is due to a person's ability to recognize better same sex faces. Similar results were found by Powers, Andriks, and Loftus (1979) who reported that men were more accurate for male oriented details than were women and women were more accurate for female oriented details than were men. These findings suggest that witnesses interests might play an important role in testimony. Yarmey (1993) also found that women are significantly more accurate than men when it comes to recall for weight, hair color and length, and for characteristics considered most important for remembering people. Marks (1972) found that women were more accurate in recalling the details of objects and scenes than were men.

This study attempted to address four issues concerning the methods used to elicit information and to increase recall of eyewitnesses. Past research focused on increasing the amount of information reported by using drawings and other prompting techniques or interviews. However, it is not clear how drawing affects the witness's recall in terms of

commissions (reporting details which were not present), omissions (not reporting details/leaving out details), errors in reporting, or accuracy. That is, a witness may pay more attention to completing a drawing or using prompt which may cause them to refer to their schemas of what a perpetrator should look like and not the characteristics of the actual perpetrator. Finally, male witnesses and female witnesses might be expected to exhibit differences in commissions, omissions, accuracy, and errors due to the effects of same-sex bias.

Hypothesis

The present study examined the following hypotheses:

Hypothesis 1a: Men will be significantly more accurate in reporting of details about the male perpetrator than will women after watching a vignette of a bike theft.

Hypothesis 1b: Men will have a significantly lower amount of errors than will women when reporting details about the male perpetrator after watching a vignette of a bike theft.

Hypothesis 2a: There will be a significantly lower amount of accuracy in recalling details about the perpetrator when using drawings to elicit details as opposed to thinking about the perpetrator.

Hypothesis 2b: There will be a significantly greater amount of inaccuracy in recalling details about the perpetrator when using drawings to elicit details as opposed to thinking about the perpetrator.

Hypothesis 3: There will be a significantly greater amount of commissions as compared to omissions when using the drawings to elicit details as opposed to thinking about the perpetrator.

METHODS

Participants

Ninety college students (31 men and 59 women) were recruited to participate in this study. The participants, ranging from freshman to seniors, were enrolled at Emporia State University. The university students were recruited from beginning psychology classes and offered class points for their participation. Assignment to groups was done by hanging up one appointment sheet each week for three consecutive weeks. Each week corresponded to one of three Thursday nights. Those who signed up on the first sheet were assigned to the drawing group, those who signed up on the second sheet were assigned to the puzzle group, and those who signed up on the third sheet were assigned to the thinking group.

Materials

A VHS videotape portraying the theft of a bicycle was developed by Shapiro and Brooks (1999) and was used as the stimulus for recall in this project. The video was twelve minutes long and featured female twins who visited the Kansas City Zoo. At the beginning of the film, the twins witnessed a scene in which a teenage boy attempts to borrow a younger girl's bicycle, but was repeatedly denied permission. The boy left momentarily, then sneaked back and stole the bike.

An open-ended questionnaire was developed by Shapiro and Brooks (1999). Questions pertaining to the perpetrator's features were used to elicit information from the participants as to the perpetrator's features.

Coding System

A videotape of a bike theft had been previously evaluated to determine the important details and actions contained within the vignette. The current coding system assigned a point value for nine physical features of the perpetrator that were reported correctly or incorrectly by the participant (Brooks & Shapiro, 1999). The nine features coded were the perpetrator's name, hair color and facial characteristics, hair length, height/weight and build, age, clothing, shoes, watch, and gender. Points for accuracy scores were coded for correct information as follows: partial credit (1 point) was given when the participant gave some information (e.g., curly hair), full credit (2 points) was given when the participant gave complete information (e.g., brown hair), and elaborated credit (3 points) was given when the participant gave complete information with details (e.g., curly brown hair). That is, for each feature, the participants could provide a full credit response (e.g., the perpetrator was wearing jeans) and general details (e.g., a dark shirt) or correct information (e.g., a black shirt), or wrong information (e.g., a light shirt). The point value of 0 was assigned when the participants did not provide information about a feature, or if they indicate that they do not know the answer. Inaccurate information was coded as: error partial credit (1 point) given when participants gave some incorrect information (e.g., wrong detail), error full credit (2 points) was given when the participant gave incorrect information alone, and elaborated error credit (3 points) was given when the participant gave incorrect information with details (e.g., straight black hair). The accuracy score was obtained by adding the number of points given for the correct details obtained. The error score was obtained by adding the number of error

credit. There was a possibility of twenty-four total points which could be earned for accurate information and twenty-four possible total points for inaccurate information reported.

Features were also scored for being present, omitted, or containing incorrect information in order to examine the number of omissions and commissions for each participant. The omission score was obtained by giving the participant one point for each of the nine features in which a feature was not provided. The commission score was obtained by giving the participant one point for each of the nine features in which the participant reported at least one inaccurate detail. If the participant reported some accurate information and some inaccurate information on the same features the inaccurate information was scored as an error of commission.

Procedure

An application to the Human Subjects Review Board at Emporia State University was submitted and approved (Appendix A). Participants were informed as to the purpose of the study, expectations of participants, and assurance of anonymity. Those individuals who agreed to take part in the study were asked to sign a consent form before beginning the study (Appendix B). Each participant was asked to sign a release form for the use of their artwork (Appendix C). A number was given to each participant to conceal his/her identity. After informed consent and demographic information was collected, the researcher showed a videotape (Brooks & Shapiro, 1999). The tape contained a vignette of a bike theft lasting approximately two minutes.

The researcher showed the videotape to each group of participants on a VHS VCR

and 25 inch television screen. Participants viewed the video from varying distances of anywhere from three feet to thirty feet. The participants were divided into three groups of thirty depending on the week they signed up. All participants engaged in the study on the same night of the week (Thursday) at 7:00 PM. Each week, when all the participants were seated in the classroom, the researcher turned on the television telling the participants they could watch the video while the researcher finished getting things set up. The first week, one third of the participants watched the video then were instructed to drawing a picture of the perpetrator using magic markers. They were given ten minutes to create this drawing. The second week, one third watched the video then were instructed to complete a puzzle for ten minutes. The third week, one third watched the video then were instructed to spend ten minutes thinking about the perpetrator. The purpose of the three groups was to determine the effect each of these tasks had on the participants' ability to report details in terms of omissions, commissions, accuracy and error. After engaging in one of these three activities for ten minutes all the participants completed a memory questionnaire. Each group was given the same amount of time between viewing the vignette and completing the questionnaire.

CHAPTER 3

RESULTS

Hypothesis 1

Three different sets of analyses were conducted to review the hypotheses. The first set of analyses focused on sex differences in accuracy and inaccuracy in recall. Two t-tests were conducted using gender as the independent variable. In the first t-test, there was significant gender difference in accuracy, t (88) = 2.49, p=.015. Men (M = 12.903, SD = 2.925) had significantly higher scores on accuracy than did women (M = 11.41, SD = 5.59). In the second t-test, no significant gender differences were found for inaccuracy, t (88) = -1.38, p = .173.

Hypothesis 2

In the second set of analyses, two one-way analyses of variances using group as the independent variable were performed for accuracy and for inaccuracy. The first one-way analysis of variance revealed a significant group difference in the amount of inaccuracy, (F (2, 87) = 5.25, $p \leq .01$). Table 4 gives a summary of the inaccuracy scores by group. A Tukey post hoc procedure was performed for inaccuracy on the three group means. The puzzle group (M = 2.33, SD = 1.99) had a significantly higher mean inaccuracy score than did the thinking group (M = .97, SD = 1.33). The second one-way analysis of variance yielded no significant difference between the groups for accuracy (F (2,87) = .35, p = .71).

Hypothesis 3

The third analysis used a repeated measures analysis of variance to examine group

Table 1

Descriptive Statistics for Accuracy by Gender and Group

	Men			Women			Total		
	M	(SD)	n	M	(SD)	n	M	(SD)	n
Drawing	12.462	(2.222)	13	11.294	(2.910)	17	11.800	(2.658)	30
Thinking	12.846	(3.236)	13	11.824	(2.404)	17	12.267	(2.791)	30
Puzzles	14.200	(3.899)	5	11.200	(2.566)	25	11.700	(2.973)	30
Total	12.903	(2.925)	31	11.407	(5.594)	59	11.922	(2.789)	90

Table 2

Descriptive Statistics for Inaccuracy by Gender and Group

	Men			Women			Total		
	M	(SD)	n	M	(SD)	n	M	(SD)	n
Drawing	2.000	(1.291)	13	1.941	(1.983)	17	1.967	(1.691)	30
Thinking	.923	(1.256)	13	1.000	(1.414)	17	.967	(1.326)	30
Puzzles	1.200	(2.683)	5	2.560	(1.805)	25	2.333	(1.989)	30
Total	1.419	(1.587)	31	1.432	(1.846)	59	1.756	(1.769)	90

Table 3

Descriptive Statistics for Type of Error by Group

	Omissions		Commissions		Totals	
	M (SD)	n	M (SD)	n	M (SD)	n
Drawing	3.233 (1.135)	30	1.300 (.988)	30	4.533 (2.123)	30
Thinking	2.867 (1.224)	30	.667 (.802)	30	3.534 (2.026)	30
Puzzles	3.133 (1.224)	30	1.567 (1.104)	30	4.700 (2.328)	30
Total	3.078 (1.192)	90	1.178 (1.034)	90	4.256 (2.226)	90

Table 4

One-way Analysis of Variance for Inaccuracy Scores by Group

Source of Variation	SS	df	MS	F
Group	30.02	2	15.01	5.25*
Within Cells	248.60	87	2.85	

* $p < .01$

differences in two types of errors, omission and commission. Results indicated a significant group difference for the number of commissions. Table 5 provides a summary of the repeated measures analysis of variance design for the commission scores by group. A Tukey post hoc procedure was performed on the three group means. The group which engaged in thinking (M=.6667, SD=.8023) committed significantly fewer errors of commission than did the drawing group (M = 1.300, SD = .9879) or the puzzle group (M = 1.567, SD = 1.104), which did not differ significantly from one another. The analysis also indicated a significant difference in the type of error. Participants committed significantly more omissions (M =3.078, SD = 1.178) than commissions (M = 1.178, SD = 1.034).

In summary, men had greater accuracy than did women across all the three treatment groups. The puzzle group was more inaccurate than the thinking group. There was no significant difference between the drawing group and the puzzle group or the thinking group in inaccuracy. The puzzle group and the drawing group committed more errors of commissions than did the thinking group. There was no significant difference in the number of commissions between the puzzle group and the drawing group. Participants committed significantly more errors of omission than errors of commission.

Table 5

Repeated Measures Analysis of Variance for Commission Scores by Group

Source of Variation	SS	df	MS	F
Group	11.94	2	5.97	3.54*
Within Cells	146.62	87	1.69	
Error Type	162.45	1	162.45	235.49**
Group by Error Type	3.03	2	1.52	2.20*
Within Cells	60.02	87	.69	

* $p < .05$

** $p < .001$

CHAPTER 4

DISCUSSION

The intent of this study was to give the judicial system information to understand better the issues it faces when using drawings, in addition to verbal description, to obtain information from witnesses. Researchers and the legal system may apply these results by being more aware that using drawing could lead the witness to refer to their schemas of what a perpetrator should look like. Thus, the witness may be encouraged to provide additional details which were not true of the current perpetrator. This study directed attention to drawings as a possible handicap to improving recall in eyewitness testimony. The structure and characteristics of drawings as visual images may encourage the participant to add details that were not present merely to make the picture complete.

Hypothesis 1

The findings from the present study indicated men were more accurate in reporting details than were women. This may be due to a same-sex bias exhibited by the observer, in that a male perpetrator was used in the current study, rather than a difference in ability between men and women. Previous studies have indicated that witnesses remember and report more details about a same-sex perpetrator (Yarmey & Jones, 1983; Ellis, et al., 1973; Powers, et al., 1979). Thus, men will remember more about a male perpetrator and women will remember more about a female perpetrator. This research would help to explain the differences found in accuracy between genders.

Hypothesis 2

The results also revealed that the group who engaged in puzzles had an increased

number of inaccuracy in descriptive features compared to the group that engaged in thinking about the perpetrator. This could be a result of the puzzle group being distracted from even thinking about the crime scene, whereas the thinking group spent time ruminating about the crime scene. By engaging in a distractor task the puzzle group may have relied more on their schemas for criminals rather than the actual perpetrator. The results did not demonstrate a significant difference between the group that engaged in drawing a picture of the perpetrator and those who engaged in thinking about the perpetrator or those who engaged in puzzles in the amount of errors. This may be due to the drawing group also ruminating about the perpetrator as did the thinking group. Yet drawings also requiring the participant to focus on drawing a complete picture of the perpetrator which may have encouraged participants to refer to their schema, thus making increasing errors. Drawing, like puzzles, may have functioned as a distractor task by taking the focus of the actual perpetrator and putting it on the drawing of a picture.

Hypothesis 3

It was also found that the group who engaged in puzzles and the group who drew a picture of the perpetrator between viewing the crime scene vignette and describing the perpetrator reported significantly more commissions (adding of incorrect details) than did the group who engaged in thinking about the perpetrator. The thinking group reporting fewer additional incorrect details could be due to their chance to ruminate about the perpetrator where as the puzzle group was distracted entirely from thinking about the perpetrator. Thus, the puzzle group may have had increased commissions due to engaging in a distractor task. The drawing group may have reported additional incorrect details due

to filling in of the blanks to make the drawing more complete. The drawing group, like the thinking group, ruminated about the perpetrator, but focused on drawing a complete picture of the perpetrator. Focusing on drawing a complete picture of the perpetrator may have caused the participants to refer to their schema of a perpetrator. By referring to their schema, participants may have been influenced to add details which were not characteristics of the actual perpetrator to make the drawing more complete. This adding of details into the drawing could then have influenced their memory for the actual details of the perpetrator causing them to report more commissions.

A difference was found between the amount of commissions and the amount of omissions reported across all groups. The participants were more likely to leave out details they did not know then they were to provided inaccurate details of the perpetrator.

Implications

Also of interest is the effect on all four dependent variable in terms of the varying distances and angles the participants were viewing the television from. It is apparent through the average score on accuracy that the varied distances had a significant effect. The average score of all participants was twelve out of twenty-four possible points which could be obtained by providing correct answers with elaboration. The distance from the television may also have encouraged participants to refer to their schemas for characteristics which they could not view clearly. For further research it would be recommended that participants are all provided with closer and equal viewing distances to more clearly understand the effects of this. Although, in eyewitness testimony viewing the perpetrator from varying distances and angles are a reality that can not be controlled and has to be taken into consideration.

Conclusions and Further Directions

It is apparent the data collected may not be representative of the entire population. Therefore, to gain a better understanding of the current findings, further research is needed. A study in which the vignette contains a female perpetrator would be helpful in determining whether there was a same-sex bias affecting omissions and accuracy. A study where one group picks characteristics and features of the perpetrator, perhaps putting them together using a computer program, would also be useful in determining the effects of drawing or creating a picture of the perpetrator on the recall of details. Having the characteristics already available would eliminate the participant totally recalling and accurately drawing the features, yet would still help in determining whether creating a picture leads to more commissions. Finally, a larger number of subjects would improve the probability of having a more representative sample.

The use of drawings is increasingly being used in eyewitness testimony, both with children and adults. While the current study indicates that drawing has little impact on overall accuracy of recall, more research is needed to better understand what role drawings actually have in eyewitness testimony in a variety of settings.

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Appendix A

Application For Approval To Use Human Subjects

APPENDIX C

APPLICATION FOR APPROVAL TO USE HUMAN SUBJECTS

For R&G Use Only	Date approved _____		
File No. _____	Full Review _____	Expedited Review____	Exempted Review ____

This application should be submitted, along with the Informed Consent Document and supplemental material, to the Institutional Review Board for Treatment of Human Subjects, Research and Grants Center, Plumb Hall 313F, Campus Box 4003.

1. Name of Principal Investigator(s) (Individual(s) administering the procedures):

Jacquelin Psota

2. Department Affiliation: Psychology and Special Education

3. Person to whom notification should be sent: Jacquelin Psota

Address: 1201 Triplett Dr. B16 Emporia, KS 66801 Telephone: 316-340-0100

4. Title of Project: An Examination Of The Effects Of Drawing On Memory Recall And Accuracy

5. Funding Agency (if applicable):

6. This is a dissertation _____ thesis _X_ class project _____ other _____

7. Project Purpose(s):

This project is a modification of a project already accepted by the IRB, entitled "Age Differences in Criminal Identification and Testimony" by Marcy Bowe, Corey Palmer, Melissa Acosta Hamrick, and Lauren Shapiro. The original set of questions, materials (i.e. films and questionnaire), and procedures will be used in the current study except as noted below. The purpose of this study is to determine whether the use of drawings encourages adults to fill in the gaps in their memory just to make the drawing complete. Many questions to be asked in this study deal with the participant ability to be able to recall details after one of three activities; drawing, puzzles, thinking. Also of interest is the difference in gender related to the number of details participants relate. With such information, the legal system should be better able to understand the issues it faces when using drawings versus verbal description to obtain information from witnesses.

8. Describe the proposed subjects: *(age, sex, race, or other specific characteristics, such as students in a specific class, etc.)*

The participants in this study will be only college students currently enrolled in an introductory psychology class at Emporia State University, ranging from freshman to seniors.

9. Describe how the subjects are to be selected:

In order to recruit participants the researcher will post a sheet outside the psychology office on which students can sign up to participate in the study.

10. Describe the proposed procedure in the project. Any proposed experimental activities that are included in evaluation, research, development, demonstration, instruction, study, treatments, debriefing, questionnaires, and similar projects must be described here. **Copies of questionnaire, survey instruments, or tests should be attached.** *(Used additional page if necessary.)*

Participants will be informed as to the purpose of the study, expectations of participants, and assurance of anonymity. Those individuals who agree to take part in the study will be asked to sign a consent form before beginning the study (see attached). Each participant will be asked to sign a release form for the use of their artwork (see attached). The forms will be given a number that will automatically identify the participant from that point forward. After informed consent is filled out, the researcher will show a videotape. Only one version of the film, the male consistent version, will be used in this study. A photo line-up will not be used in this study, instead the researcher will be asking one third of the participants to draw a picture of the perpetrator using magic markers, one third will think about the perpetrator, and one third will engage in puzzles. Thus participants will view the male consistent film, engage in one of the three activities, then complete a memory questionnaire (See enclosed).

11. Will questionnaires, tests, or related research instruments not explained in question #9 be used? ____ Yes __X__ No *(If yes, attach a copy to this application.)*

12. Will electrical or mechanical devices by used? ___ Yes __X__ No *(If yes, attach a detailed description of the device(s) used and precautions and safeguards that will be taken.)*

13. Do the benefits of the research outweigh the risks to human subjects?

__X__ Yes ___ No *(If no, this information should be outlined here.)*

14. Are there any possible emergencies which might arise in utilization of human subjects in this project?
___ Yes __X__ No *(If yes, details of these emergencies should be provided here.)*

15. What provisions will you take for keeping research data private? *(Be specific.)*

The participants will be given a number with the informed consent that will automatically identify the participant from that point forward. The informed consent documents will then be placed in a locked filing cabinet.

16. **Attach a copy of the informed consent document, as it will be used for your subjects.**

STATEMENT OF AGREEMENT: I have acquainted myself with the Federal Regulations and University policy regarding the use of human subjects in research and related activities and will conduct this project in accordance with those requirements. Any changes in procedures will be cleared through the Institutional Review Board for Treatment of Human Subjects.

_____ _____

Signature of Principal Investigator Date

_____ _____

Faculty advisor/instructor on project (if applicable) Date

Appendix B

Adult Informed Consent

ADULT INFORMED CONSENT

Emporia State University supports the practice of protection for human participants in research and related activities. The following information is provided so that you can decide whether you wish to participate in the present study. You should be aware that even if you do agree to participate, you are free to withdraw at any time, and that if you do withdraw from the study, you will not be subject to reprimand.

You are invited to participate in a study investigating cognitive aptitude. If you wish to participate in this study, you will be asked to draw, do puzzles, or engage in thought. Next you will be asked to answer a memory questionnaire. Your participation in this study is completely voluntary. Your name will not be associated with the research findings and will in no way affect your class status.

If you have any questions about this study, feel free to ask. I can be reached at 341-5383.

Thank you,

Jackie Psota

I, _____, have read the above information and decided to participate.

I understand that my participation is voluntary and that I may withdraw at any time.

_____ _____

(Signature of participant) (Date)

Appendix C

Art Release Form For Using Participant Art

Art Release Form For Using Participant Art

I, _____, agree to allow Jackie Psota to use and/or display or photograph my artwork for the following purpose(s):

- Educational purposes (without compensation to the artist/participant.)
- Publication in a professional journal (without compensation to the artist/participant.)
- Presentation at a professional conference (without compensation to the artist/participant.)

The drawings will remain anonymous.

Signed_____ Date_____

****

I, Jackie Psota, agree to the following conditions in connection with my use of artwork by _____.

- I agree to safeguard your artwork to the best of my ability.
- I agree to safeguard your confidentiality.
- I agree to return your artwork if you decide to withdraw your consent.

Signed_____ Date_____

Appendix D

Memory Questionnaire

Subject # _____ Subject: M___ F___ Age: _____

Memory Questionnaire

Sometimes something happens to people and they need to call the police to get some help. The police officers' job is to find out more information. So they go around asking if anyone saw what happened. If people know any information, they are suppose to tell the police what they saw. You just saw a movie about twins who went to the zoo. The twins saw something happen in the picnic area. So if the police asked them about that, they would have to tell everything they saw. Our goal is to find out how much people really can remember about activities that they see. Please write down everything you REALLY remember about what happened in the picnic area. But, don't write anything about what the twins did at the zoo.

Description of the Perpetrator

Please describe the perpetrator, the person who stole the bike, and the perpetrator's actions in the space below. If you are not sure about the information requested, please state, "I don't know" rather than guess. Additional paper is provided if you need more room for the descriptions. In the space below, please specify how the person looked, especially the facial features (e.g., facial hair, distinguishing features or marks), the person's hair style and color, and everything the person was wearing (i.e., clothes and accessories). Provide estimates of height and build, weight, and age.

PERPETRATOR: Name_____ Gender: M____ F____ Age: ____

Facial Characteristics: _____

_____

_____

_____

_____

Hair Color and Style: _____

_____

_____

_____

_____

Clothes and accessories (specify type and color): _____

_____

Height/Weight and Build: _____

Other descriptive information: _____

Appendix E
Coding Scheme

Coding Scheme

The researcher will score the correct and erroneous information on individual coding sheets. The information elicited from the adults will be given a score. The value will reflect the completeness of the answer.

The score will indicate how completely the participants answered the question. The coding for correct point values will be assigned as follows: Partial credit (1 point) will be given when they give some correct information (e.g., detail or correct action), Full credit (2 points) will be given when the participant gives correct information alone, and Elaborated credit (3 points) will be given when the participant gives correct information with details (e.g., curly brown hair) and/or dialogue. That is, for each feature the participants would provide a full credit response (e.g., the perpetrator was wearing jeans) and general details (e.g., a dark shirt), or correct information (e.g., a black shirt) or wrong information (e.g., a light shirt). The point value of 0 will be assigned when the participants do not respond with an answer, or if they indicate that they do not know the answer.

Use the following to score responses:

PHYSICAL CHARACTERISTICS

Perp's Name	
Full Credit: Frankie, Frank	2 points
ERROR:	
Error Full Credit: Ashley or ANY other name	2 points
Perp's Hair Color and Facial Characteristics	
Elab: correct color and facial characteristics (e.g., no glasses, no facial hair, some zits)	3 points
Full Credit: Dark Brown, Brown, Black	2 points
Partial Credit: dark	1 point
ERROR:	
Error Partial: light	1 point
Error Full Credit: Blonde or Light Blonde or Wrong Color	2 points
Error Elab: Wrong color and wrong characteristics	3 points

Perp's Hair Length

Elab: Short and ...Bangs, or curled around face, wavy	3 points
Full Credit: Short, shows length to the bottom of the chin, states like mine (and falls within the parameters)	2 points
Partial Credit: wore it down, it was unruly (or shows it big)	1 point
ERROR:	
Error Partial: Straight	1 point
Error Full Credit: Medium or long (beneath the chin)	2 points
Elab Error Credit: Long and in a ponytail or wore it up	3 points

Perp's Height/Weight and Build

Elab: taller than the girl, medium build, additional details	3 points
Full Credit: taller than the girl and medium build	2 points
Partial Credit: taller than the girl or medium build	1 point
ERROR:	
Error Partial Credit: shorter than girl or small/heavy build	1 point
Error Full Credit: shorter than girl and small/heavy build	2 points
Elab Error Credit: shorter than girl, small/heavy build, additional incorrect details	3 points

Perp's Age

Full Credit: middle teens	2 points
ERROR:	
Error Full Credit: older or younger age group	2 points

CLOTHING

Perp's Clothing

Elab: Black and ...with white lettering, wore jeans or pants	3 points
Full Credit: Black Shirt	2 points
Partial Credit: Dark Shirt, pants or jeans (no color specified), letters on shirt	1 point
ERROR:	
Error Partial Credit: One incorrect item (e.g., shorts) or wrong color	1 point
Error Full Credit: pink or any other color shirt	2 points
Elab Error Credit: Two or more incorrect items	3 points

Perp's Shoes

Elab: Hiking boots and...brown	3 points
Full Credit: Boots, Hiking Boots	2 points
Partial Credit: Brown Shoes	1 point
ERROR:	

Error Partial Credit: Incorrect color of shoes	1 point
Error Credit: sandals or wrong type of shoes	2 points
Elab Error Credit: Incorrect type and color of shoes	3 points

Perp's Watch

Elab: Big and Black	3 points
Full Credit: Big or Black	2 points
Partial Credit: Reporting a watch	1 point
ERROR:	
Error Partial Credit: something around wrist	1 point
Error Full Credit: describe as small or gold	2 points
Elab Error Credit: Small and Gold	3 points

Perp's Gender

Full Credit: boy	2 points
ERROR:	
Error Full Credit: girl	2 points

CORRECT FEATURES

Frankie
Brown/black short hair
Black shirt w/ white lettering
Blue Jeans
Brown/black hiking boots
Big, black watch
No glasses, no facial hair, some zits

Physical Characteristics, Clothing, & Actions	Points	Error Points
Perp's Name		
Perp's Hair Color and Facial Characteristics		
Perp's Hair Length		
Perp's Height/Weight and Build		
Perp's Age		
Perp's Clothing		
Perp's Shoes		
Perp's Watch		
Perp's Gender		
Total Points:		

Permission to Copy

I, Jacquelin N. Psota, hereby submit this thesis to Emporia State University as partial fulfillment of the requirements for an advanced degree. I agree that the Library of the University may make it available for use in accordance with its regulations governing materials of this type. I further agree that quoting, photocopying, or other reproduction of this document is allowed for private study, scholarship (including teaching) and research purposes of a nonprofit nature. No copying which involves potential financial gain will be allowed without written permission of the author.

Jacquelin N Psota
Signature of Author

4-11-00
Date

An Examination Of The Effects Of Drawing On Memory Recall And Accuracy
Title of Thesis

Mary Cooper
Signature of Graduate Office Staff Member

April 12, 2000
Date