EYEWITNESS IDENTIFICATION AS A FUNCTION OF THE NUMBER OF PHOTOGRAPHS VIEWED AND THE DEGREE OF FACIAL SIMILARITY AND CONGRUENCY AMONG EMOTIONAL EXPRESSIONS

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CHAPTER I

INTRODUCTION

The potential for error in the eyewitness identification of a criminal suspect has been apparent since the publication of Hugo Munsterberg's On the Witness Stand (1908). Despite this initial effort, numerous cases have occurred during the past 70 years in which innocent individuals have been arrested, tried, convicted, and imprisoned on the basis of testimony from a single eyewitness, or even as many as 20 or more eyewitnesses. In Convicting the Innocent, Borchard (1932) lists 29 cases where erroneous identification of the accused was solely responsible for the conviction. He states that

> Juries seem disposed more readily to credit the veracity and reliability of the victims of an outrage than any amount of contrary evidence by or on behalf of the accused, whether by way of alibi, character witnesses, or other testimony (p. xii).

More recent researchers and practitioners have continued to develop Borchard's theme. Wall (1965) details several cases where questionably reliable eyewitness identification occurred. In probably the most publicized of these cases, the Commonwealth of Massachusetts vs. Sacco and Vanzetti (1921), the jury heard at least seven key identification witnesses positively place the defendants near the scene of the crime. All had previously stated to police, however, that they were unable to identify anyone. In another widely discussed case, Englishman Adolf Beck was convicted after being

identified by 22 witnesses. After serving his seven year sentence, it became apparent that Beck had been erroneously convicted, and he was exonerated. A committee formed to investigate the case concluded that

> . . . evidence as to identity based on personal impressions, however bona fide, is perhaps of all classes of evidence, the least to be relied upon, and therefore, unless supported by other facts, an unsafe basis for the verdict of a jury (Watson, 1924, in Wall, 1965, p. 17).

English trials now require corroboration of eyewitness testimony, and a conviction may be overturned if unreliable identification procedures are present. The American judicial system, while aware of possible deficiencies in eyewitness identification, has continued to allow uncorroborated identifications and has seldom overturned a conviction on these grounds. The general consensus is that it is the duty of the jury to weigh the eyewitness testimony along with the other evidence when reaching a verdict. But, of course, even questionable eyewitness identifications carry with them the force of the government's prosecution team.

In recent Oklahoma district court proceedings (June, 1977), Hossein Assodollah was tried for the murder of his wife in a trial in which the prosecution's sole piece of direct evidence linking the suspect to the crime scene, was the testimony of two eyewitnesses. One of these had been unable to give any description or make any identification the day of the crime. Unsure of what weight to place on the eyewitness testimony, the jury deadlocked at ten to two for acquittal and a mistrial was declared. With less emphasis placed on the possibly unreliable eyewitness identification, the retrial (September, 1977) resulted in a first degree murder conviction. The sentence was set at life imprisonment.

Regardless of the reliability of eyewitness identification, it often becomes the focal point of a jury's decision to acquit or convict. But obviously, most efforts at identification (initial description, mugshots, and/or lineup) have been completed long before the case goes to trial. Any identification in the courtroom would be of less than optimal value if proper procedures were not followed to obtain that identification. Because of the often crucial importance of eyewitness description and identification in both the apprehension of a suspect and possible later judicial proceedings, an attempt to specify factors that may contribute to a just and efficient method of identifying suspects is justified.

CHAPTER II

REVIEW OF THE LITERATURE

An eyewitness identification of criminal suspects can assume one, or both of two generally recognized methods. The first, a photographic identification, or "mugshots," is a collection of photographs of previously arrested persons. The second method, a corporeal identification, or a "lineup," is a group of 6 to 12 persons, one of whom is usually the prime suspect. Investigations of a mugshot spread or a lineup are infrequent, and the few studies conducted have generally focused on the lineup. This is surprising in light of the fact that the lineup is apparently less frequently used by police departments and is likely to generate greater problems of scientific control than research of mugshot identification.

Several questions regarding proper mugshot procedures are of interest for both theoretical and practical reasons. The degree of similarity of the various photographs is of prime concern. This would appley both to certain qualities of the photograph and to the characteristics of the persons pictured. The photographs should be as similar as possible on several dimensions: film type (all color or all black-and-white), composition (all mugshots with evidence of arrest or no actual mugshots), size, and photographic quality. The individuals pictured in the mugshots should, of course, be of

sufficient similarity to the suspect so as to be adequately distractive. This would include reasonable similarity of facial complexion; hair style; facial hair; facial expression; age; any outstanding features, such as scars; and clothing.

A second question concerns the number of photographs necessary for a fair and accurate test of the witness' memory. Obviously, at least two are necessary; but even with five, the odds of picking any one photograph by chance alone are 20%. Although no requirements have been established in the United States regarding the minimum number of photographs for a photographic spread, England and France require 8 to 10 and 15 to 20 photographs, respectively (Wall, 1965).

Additionally, facial expression variations may play a role in photographic identification. Although a witness may observe several different expressional variations in a real-life encounter, the expression of the person in the photograph is a static feature just as are the eyes, nose, and ears. Will any expression different from neutral attract more attention to the suspect? Or, is a smile processed differently than a frown?

As previously stated, little psychological research has been conducted specifically concerned with mugshot identification of suspects. The main body of research literature that does touch on the area can be generally classified as "recognition memory" or more specifically as "facial recognition" studies.

Recognition Memory

Recognition memory involves "the identification of some previously experienced configuration or event" (Ellis, 1975, p. 409). Most

recognition research has focused on pictorial memory, and several researchers have reported quite high recognition rates for a variety of stimuli. Haber (1970) presented subjects with 2560 photographic slides of various scenes and found an 85-95% success rate in a paired-alternative forced-choice test series. Similar experiments by Shepard (1967) and Nickerson (1965) reported equally high success rates of 95% and 97%, respectively, after an inspection series of 600 slides of various objects and scenes. In the above experiments, subjects were shown two slides during the test phase, one "new" and one "old", and asked to indicate which had been previously viewed. One reason for these high success rates is that, in general, the slides viewed were heterogenous in content. No attempt was made to test discrimination of homogenous stimuli, but rather to establish recognition rates for a broad class of stimuli.

Another explanation for the high accuracy scores could be that the heterogeneous material was simultaneously coded verbally and visually (Goldstein & Chance, 1970). With a variety of objects, it might be possible to code individual slides according to some concept such as "car," "baseball," or "barnyard scene." This task is clearly different from the case in which one selects a particular car from a parking lot of cars.

Facial Recognition

Other studies using only the human face as stimuli report comparably high recognition rates. Hochberg & Galper (1967) and Galper & Hochberg (1971) report recognition rates of over 90% for female faces. Yin (1969), with male faces as stimuli, also found

accuracy scores over 90%. As with the previous pictorial recognition studies, the facial stimuli were fairly heterogeneous. The authors reported photographs were selected at random from a college yearbook, with no attempt to equate for similarity.

Similarity of Photographs

In an experiment designed to measure the effect of extreme homogeneity of stimuli, Goldstein & Chance (1970) presented subjects with one of three series of highly homogeneous stimulus slides. During the inspection phase, subjects viewed 14 slides of female faces, inkblots, or snow crystals. They then made 84 "old--new" choices during the test phase which was conducted either immediately or 48 hours later. As expected, recognition rates for the homogeneous material were lower than the rates previously reported for heterogeneous stimuli. Recognition was still fairly high for faces (71%), but much lower for inkblots (46%) and snow crystals (33%). Although Goldstein & Chance (1970) tested for interference of homogeneous stimuli, this effect may have been lessened due to the small number of slides in the inspection phase compared to the number used by Haber (1970), Nickerson (1965), and Shepard (1967). Although faces were better recognized than the other stimuli, between-class comparisons of this nature are inappropriate.

While the previously reviewed studies report quite high recognition rates for human faces, more recent research is of greater applicability to actual mugshot identification. A series of interrelated studies by Alexander (1972); Lane (1972); Laughery, Alexander, and Lane (1971); Laughery (1972); Laughery, Fessler, Lenorovitz, and

Yoblick (1974); and Sussman (1972) focused on several important factors which have direct implications for actual mugshot procedures. Using three different operational definitions of similarity, Laughery et al. (1974) found a consistent pattern of greater similarity (of target and distractors) leading to lower recognition rates. Similarity of photographs also interacted with target position in the series of 150 test photographs. Thus, recognition of highly similar distractor/ target photographs was affected more when the target was in position 140 than position 40.

Number of Photographs

The number of photographs viewed in the test phase affects recognition rates. Alexander (1972), Laughery et al. (1971), and Laughery et al. (1974) found that recognition performance decreased as the number of distractor photographs preceding the target increased. This effect of target position is consistent with the previous literature on memory. Laughery's et al. (1971) design, however, did not allow for a distinction based on the two most common explanations. The effect may explained as due to decay (passage of time) or to interference (number of intervening items). Laughery et al. (1974) investigated whether the effect of target position was due to the number of intervening distractor faces or simply to the passage of time. They varied the delay from target exposure to the test phase over six time intervals ranging from 4 minutes to 1 week. The results clearly showed that a waiting period of up to one week had little effect on performance, whereas the critical factor was apparently the number of interfering photographs preceding the target in the search

series.

Similarily, Egan, Pittner, and Goldstein (1977) found no differences in accuracy of identification for the target over a period of 56 days, but did find an increasing probability of "false alarms" (incorrectly identifying a distractor). Laughery et al. (1974) have also noted this latter effect. As many as 9% of their subjects' judgments of distractor photographs were false alarms.

Facial Expression Variations

The effect of variations in facial expression of the persons in the mugshots is also important for identification procedures. Galper and Hochberg (1971) reported that expressional variation has an effect on facial recognition. In other words, the characteristics that differ in a neutral expression and a smiling expression may affect facial recognition. These characteristics, however, have not yet been identified. Patterson and Baddeley (1977) report that a minor change in expression has little effect on performance, although major changes, such as a disguise, may seriously impair recognition accuracy.

Time Effects

Goldstein and Chance (1971) found a significant delay effect across all stimuli (faces, inkblots, and snowflakes). Subjects tested immediately following the exposure phase performed better than those tested 48 hours later. This effect, however, was due entirely to the inkblot and snowflake stimuli--there was no delay effect for faces. This finding was replicated by Egan et al. (1977) and Laughery et al. (1974) in which the passage of time had no effect

on subsequent facial recognition tests up to 8 weeks and 1 week later, respectively. Egan et al. (1977) and Laughery et al. (1974) reported that while accuracy rates for the target remain constant, a trend toward a greater probability of false alarms occurs.

Sex Differences

Howells (1938) found females tended to be better than males at facial recognition, whereas Witryol and Kaess (1957) reported a significant difference. Goldstein and Chance (1971) also found females to be better than males at recognizing female faces (no male faces were used). No sex difference was found for recognition of inkblots or snowflakes. Cross, Cross, and Daly (1971), although reporting no overall sex differences, did find females to be superior to males at recognizing female faces. Ellis (1973) reported a similar finding with girls being more accurate than boys, but again only for female faces. Laughery et al. (1971) reported conflicting results with females approaching significantly better performance than males in one experiment, males performing better in another, and no significant differences in a third experiment. Thus, previous results would indicate that females tend to be somewhat more accurate at recognizing faces than males.

Pose of Photographs

Do different poses affect recognition performance? A portrait pose may facilitate better recognition since it may contain partial information about both the front and the side of a face; the front view, however, would lack information about the side of the face.

Lane (1972) and Laughery et al. (1971) both reported a pose position has no significant effect on recognition rates, although front view and left-portrait view led to slightly better recognition rates than right-portrait or profile views. Patterson and Baddeley (1977) also reported that recognition performance is little affected by small changes in pose position from search to test phase.

Type of Photograph

Although color pictures are expected to contain more information than black-and-white pictures, Laughery et al. (1971, 1972) found no statistical differences between color and black-and-white photographs. Sussman (1972) found recognition performance was better for color than black-and-white photographs; black-and-white videotape, however, was the best. Several important methodological differences occurred between these studies. Subjects in Laughery's et al. studies were exposed to one live target and tested after eight minutes. Sussman's target was presented on film, but there was more than one potential target. Testing occurred one hour later.

CHAPTER III

STATEMENT OF THE PROBLEM

Eyewitness identification is one area of practical concern in which the scientific rigor of psychology can be applied. Many different psychological processes are at work in the criminal justice system, but most practitioners have neither the time nor the training to adequately investigate these phenomena. Therefore, this research project will apply the scientific experimentation of psychology to a legal problem of importance to both attorneys and criminal defendants. Many researchers have conducted traditional laboratory experiments with the hope of generalizing the results to the criminal justice system. That system, however, is often not prepared to accept these "artificial" laboratory results. Hopefully, a compromise can be achieved that will be of applied value while retaining a rigorous experimental basis.

The present study will investigate several variables that can affect a photographic identification by an eyewitness to a crime. Many variables inherent in the eyewitness situation, such as arousal or stress, preparedness, race of witness and suspect, lighting conditions, etc., may have an effect on a witness' subsequent description and identification of the suspect(s). This study, however, will concentrate on three variables assumed to operate during

the identification procedure:

(1) The number of mugshot photographs that eyewitnesses should view in order to constitute an adequate test of his/her recognition of a criminal suspect.

(2) An estimate of the degree of relative similarity needed between the suspect's photograph and the "distractor" photographs.

(3) Facial expression variations that may function as an additional source of information for the witness when making an identification of a suspect.

To examine the effects of these variables, the following levels of the independent variables have been adopted: (1) Number of Photographs (6, 28, and 50), (2) Similarity of Photographs (high and low), and (3) Expression of Target (consonant and dissonant).

Based on a review of the relevant literature, the following hypotheses are proposed in regard to photographic identification of a suspect by an eyewitness:

(1) Identification accuracy rates are expected to vary as a function of the interaction between number of photographs and similarity.

a) When subjects view six photographs, identification accuracy will be greater for low similarity than for high similarity.

b) When subjects view 51 photographs, no significant differences are expected between high and low similarity.

(2) Overall identification accuracy rates are expected to be higher for low similarity than for high similarity.

(3) Overall identification accuracy rates are expected to be higher when fewer photographs are viewed.

(4) Identification accuracy rates are expected to vary as a function of the interaction between similarity of photographs and target expression.

a) In the high similarity condition, identification rates are expected to be higher for the dissonant expressions than for the consonant expression.

b) No significant differences between expressions are expected in the low similarity condition.

(5) Overall identification accuracy rates will be higher for the dissonant expressions than for the consonant expression.

(6) Identification accuracy rates in the present study are expected to be lower than the +90% rates reported in the pictorial memory literature.

(7) Identification accuracy rates are expected to be higher for those subjects who give "better" descriptions.

a) Subjects who use relatively more description categories are expected to be more accurate than those using fewer categories.

b) Subjects who use relatively more adjectives during their description are expected to be more accurate than those using fewer adjectives.

The following a priori predictions have been generated in regards to the facial expression variable:

(1) Overall identification accuracy rates are expected to be higher in the dissonant-frown condition than either the dissonant-smile condition or the consonant condition.

(2) Overall identification accuracy rates are expected to be higher in the dissonant-smile condition than the consonant condition.

CHAPTER IV

METHOD

Subjects

The subjects were 72 white female undergraduate Introductory Psychology students who received bonus points for participating. They were recruited for a study in "Monetary Exchange."

Stimulus Materials

Target. Three male upper-division students served as targets throughout the experiment. Their attire remained constant throughout and consisted of the following: (a) a long-sleeved blue shirt, (b) blue jeans, (c) brown suede shoes or tennis shoes, and (d) a gold watch. The shirt was worn tucked in with the sleeves rolled up.

Photographs. A photograph file of approximately 200 white males was prepared. These black-and-white photographs measure 3" X 3" (7.12 X 7.12 cm) and are taped on a 4" X 6" (9.66 X 15.23 cm) card. The cards are numbered in the upper-right-hand corner from 1 to 200. A front and profile photograph of the target and each of the non-targets was mounted. The non-targets were selected from the larger population by five independent judges on the basis of their relative similarity to the targets. Thus, in the high similarity condition none of the males had facial hair, facial scars, glasses, or unusual

hair styles or shirts.

Pawnshop. A "pawnshop" was created in a 15' X 16' (4.57 X 4.88 m) room with cream walls, an offwhite tile floor, a one-way mirror partially covered by pull curtains, and four large colorful paintings. The furnishings consisted of a green table; blue desk; four yellow chairs; six blue, yellow, and orange classroom arm chairs; and a counter. The counter is light yellow with a wood top and is 48" long, 26" wide, and 41" high (1.22 X .66 X 1.04 m). The room is lighted by two sets of two 4 foot (1.22 m) fluorescent lights. These produce 25-30 foot candles of illumination at a height of 5'6" (1.68 m) from a position behind the counter where the subject stood throughout the experiment.

A large, black, 1934 model of an NCR cash register sat on the counter. This register is fully operational; a bell rings and the amount of the sale appears each time the cash drawer is opened. A receipt book, a box of paper clips, a paper stapler, a desk calendar, a receipt spindle, and a pen appeared on the counter next to the cash register. The register was supplied with play money and coins.

A green sign, "Diamond Pawnshop" appeared on the back of the cash register. A second yellow sign, "Unredeemed Items Sold in 30 Days" appeared on the front of the counter. The counter was stationed approximately 2 feet (.66 m) from the wall across from the door. Thus, the target directly approached the subject for approximately 10 feet (3.05 m). A large metal shelf stood against a side wall. This shelf contained several items, including a clock radio, two small lamps, a can opener, and a slide projector.

Procedure

The subjects were met by an experimenter who conversed briefly about "monetary exchange" and explained how the pawn shop was to be operated. This included instructions on using the cash register and filling out receipts, and a discussion of a list of several items that might be pawned. A few items were listed as "No Sale." The subject was told that several "customers" would be appearing and that their task would be to pawn their item for as much as possible. Her task, as a pawnshop clerk, would be just the opposite. After being sure that the subject understood the nature of her task, the experimenter left the pawnshop.

The first customer appeared 1 1/2 to 2 minutes later. This confederate, a male, attempted to pawn a gold pocket watch. After approximately 1 minute of interaction, the confederate agreed to the price stated by the pawnshop clerk/subject. The ensuing receipt-writing made the total interaction last approximately 2 minutes. After another 1 1/2 to 2 minute pause, the second confederate, a female, appeared. She bartered briefly over the pawn value of an iron and then settled with the clerk. The interaction again totaled approximately 2 minutes. Both transactions were cordial and friendly and designed to be undramatic. Both confederates demurred at the low prices offered, but eventually accepted the subject's final offer.

Again 2 minutes later, the third confederate, a male (the target) entered the room. His demeanor was not as pleasant as the previous customers. Although not belligerant, he was arrogant and somewhat obnoxious. The interaction between the subject and this customer

was specifically designed to create an eyewitness situation. The target's conversation was roughly as follows:

> Hi, how you doing? This is a pretty nice pawnshop--you got a lot of good stuff in here. Say, I really need some money. I've got this silver plate here and I'm willing to let you have it for only $20. It's really quality silver and you might be able to sell it for a lot more than $20. So, I'll just take my money. Okay?

As this item was listed "No Sale," the subject had been told not to accept any silver items. Upon being refused a chance to pawn the plate, the target began to question the nature of the refusal. The target asked the clerk to take the plate, notice its fine construction, and note the brand name--a mark of fine quality. The target continued in this manner for nearly 2 minutes. Finally, he grabbed the plate from the clerk and stated, "You don't understand, I really need some money. I'll get somehow. You just wait and see." At this point he quickly turned away, and while leaving the pawnshop, grabbed a small electric light timer from a shelf. He then exited and slammed the door. A voice in the hall (out of view of the subject) could be heard to shout as the target ran from the room. The duration of the entire episode was approximately 2 to 3 minutes.

Suspect Description. The voice was that of another male confederate who was dressed in an authentic police uniform. If the subject attempted to follow the target, he intervened and directed her back into the pawnshop. If the subject did not leave the room, the policeman waited about 1 minute and then entered the pawnshop. He stated, "I saw someone running away from here, but he got away. Have you had any trouble?" After being informed of the theft, the policeman asked the subject if she could describe the target. They

sat at a table in the pawnshop and began the description process. The subject was first asked to describe any features she might remember (Free Recall). When these were exhausted, the policeman began probing into the various features and characteristics that had not been mentioned. Upon completion of the description, the policeman stated that the usual procedure is for a witness to look at a group of mug-shots to see if she can identify a suspect and, in about a week, the department would be in touch with her. The policeman then thanked the subject for her cooperation and exited. (see Appendix A).

Mood Check List and Partial Debriefing. After a short pause, the original experimenter entered the pawnshop and notified the subject that the experiment was now over. He then administered Byrne's Affectance Arousal Scale (1971), asking the subject to answer as she remembered she felt during the eyewitness situation. This instrument was used to estimate the degree of arousal in the eyewitness situation. Each item consists of a single word describing an emotion ("anxious") and five alternatives ranging from "not at all _____" (1) to "extremely _____" (5). Half of the 16 items are totaled to measure positive affectance arousal and the remaining items are totaled to measure negative affectance arousal. The appearance of all items is randomized. The range of each arousal dimension is from 8 (low) to 40 (high). Upon completion, the experimenter debriefed the subject, explaining the need for the creation of a mundane setting. Additionally, he emphasized that no real crime had occurred, and that the target was not actually a wanted criminal. The experimenter a arranged a time 1 week later for the photographic identification,

recorded the subject's extra credit, informed her where to obtain further information on the study, and secured a pledge of secrecy.

Photographic Identification. When the subject returned 1 week later, she was presented with a group of photographs and asked to attempt to locate the suspect. The instructions, presented verbally by the experimenter, were as follows:

> If you remember, last week there was an incident in which you were asked to give a description of someone. Based on that description, we have selected a group of mugshots for you to inspect. The suspect's photograph may or may not be present in this group. Also, certain features may be different. For example, hair can grow longer or be cut, and mustaches or beards can be grown or cut. I'm not saying the photographs have deliberately been made more difficult, but remember that certain features are less subject to change than others. If possible, narrow your choice to one photograph, but if you can't, two, or five, or ten is okay. If you are unable to make an identification, that is fine. Take all the time you need and look at the photographs in any order you like. If you want, you can pull some pictures out and compare them. If you can select a photograph indicate the code number and your confidence in your selection, and briefly describe the original incident. If you cannot make a selection indicate that in the lower portion of this form and sign your name at the bottom. Any questions?

After viewing the photographs and (a) selecting an individual as the suspect, (b) indicating that the suspect's photograph was absent from the set, or (c) expressing uncertainty, the subject completed and signed a legal document for the "District Attorney" (see Appendix B). If an identification was made, then the subject completed the upper portion of the form which read, "I, . . . did willfully and lawfully identify a photograph of the individual . . ." The subject would write a statement which described the incident with the target and the stolen item. If no individual was identified as

the suspect, then the subject completed the lower part of the form which read, "I . . . was unable to make a positive identification from the photographs I was shown." The subject then indicated her confidence in her decision on a seven point scale. One end was labelled "very low confidence" (1) and the other end "very high confidence" (7). Finally, the subject signed the form immediately below the statement "I have examined the statements in the foregoing information and find them, to the best of my knowledge, factual."

When finished, the subject was informed if her choice was correct or incorrect, and any further debriefing was conducted. This would include statements about which experimental condition the subject was tested under, and some previous results in eyewitness research. A pledge of secrecy was again obtained.

CHAPTER V

RESULTS

The basic design for the analysis was a 3 X 2 X 2 analysis of variance. The three factors were Number of Photographs (6 vs. 28 vs. 50), Similarity of Photographs (high vs. low), and Target Expression (consonant vs. dissonant). The analyses were performed on the dependent variables of subjects' (a) accuracy of identification, (b) subjective estimate of confidence in identification, and (c) time needed to make an identification. An ANOVA was also performed to test for possible target effects on the dependent variables. Additionally, two types of dissonant expressions (smile vs. frown) were analyzed by a *t*-test. Correlational statistics were also calculated for various dependent variables (such as identification accuracy, confidence, Byrne's Affectance Arousal Scale, and height, weight, and age estimates). The results of the analyses are summarized in Table I.

Suspect Identification

Subjects made 13 incorrect identifications (out of 72) for an overall accuracy rate of 82%. Of the 13 subjects who missed on their identification, four made identifications of the wrong individual and nine could not identify a suspect.

Table I

SUMMARY TABLE FOR ANALYSIS OF VARIANCE

	A Photographs 6 vs. 28 vs. 50	B Similarity High vs. Low	C Expression Consonant vs. Dissonant	AB	AC	BC	ABC
SUSPECT IDENTIFICATION							
Adjusted Accuracy	NS	NS	NS	NS	3.22*	NS	NS
Unadjusted Accuracy	2.55[a]	NS	NS	NS	3.16*	NS	NS
Confidence	NS	NS	NS	NS	NS	NS	NS
Time	7.82**	3.55[a]	NS	NS	NS	NS	NS

[a] $p < .10$
* $p < .05$
** $p < .001$

Identification Accuracy

Subjects were assigned a "1" for a "hit" (correct identification) and a "0" for a "miss" (incorrect identification). In order to adjust for guessing, the chance rate of identifying a photograph was subtracted from the score of each subject who made a hit. Thus, if the subject viewed 6 photographs, 1/6 or .167 was subtracted from his score. If the subject viewed 28 photographs, .036 was subtracted; and with 50 photographs, .02 was subtracted. Identification accuracy scores will also be reported when left unadjusted for guessing.

The adjusted analysis indicated that the Number of Photographs X Expression interaction was significant, F (2, 60) = 3.22, $p < .05$. Simple effects tests revealed that consonant expression leads to greater identification accuracy in the 50 photograph condition, F (1, 60) = 5.10, $p < .05$, whereas no differences were found in the 6 and 28 photograph conditions. Trend analysis indicated that there were no significant differences in the linear or quadratic trend components for the Number of Photographs X Expression interaction.

The unadjusted analysis of identification accuracy also indicated a significant Number of Photographs X Expression interaction, F (2,60) = 3.16, $p < .05$. Simple effects tests again revealed that a target expression consonant with the distractor photographs leads to greater accuracy of identification for the 50 photograph condition, F (1, 60) = 4.93, $p < .05$, but not for the 6 or 28 photograph conditions. These tests also revealed that identification accuracy was better with the smaller the number of photographs show to the witness in the dissonant expression condtion only, F (2, 60) = 3.89, $p < .05$.

No significant differences were found for number of photographs across the consonant expression condition, (see Figure 1).

Further analyses utilizing the point biserial correlation (identification accuracy is logically a dichotomous variable, ie. "hit" or "miss") indicated that identification accuracy was significantly negatively correlated with identification time, $r_{pb} = -.55$, $t\ (69) = -5.47$, $p < .001$. Thus accurate identifications were generally made more quickly than inaccurate identifications.

Additionally, identification accuracy was found to be positively correlated with the number of categories used in the suspect description and with the number of adjectives used for the various categories, $r_{pb} = .295$, $t\ (70) = 2.58$, $p < .01$; $r_{pb} = .25$, $t\ (70) = 2.17$, $p < .025$, respectively. Thus, accurate identifications were more likely to be associated with relatively fewer categories and adjectives used during the free recall description.

Identification Confidence

Subjects who were able to identify (correctly or incorrectly) a suspect estimated their confidence in their selection on a seven point scale. The small number of subjects who incorrectly identified a suspect precluded comparison between them and those subjects who correctly identified the suspect. An analysis of variance for those subjects who correctly identified the suspect indicated that none of the sources of variation were significant. Visual inspection of the cell means indicated that subjects expressed the greatest degree of confidence in the 28 photograph, low similarity, dissonant expression condition (7.0) and the least confidence in the 6 photograph, high

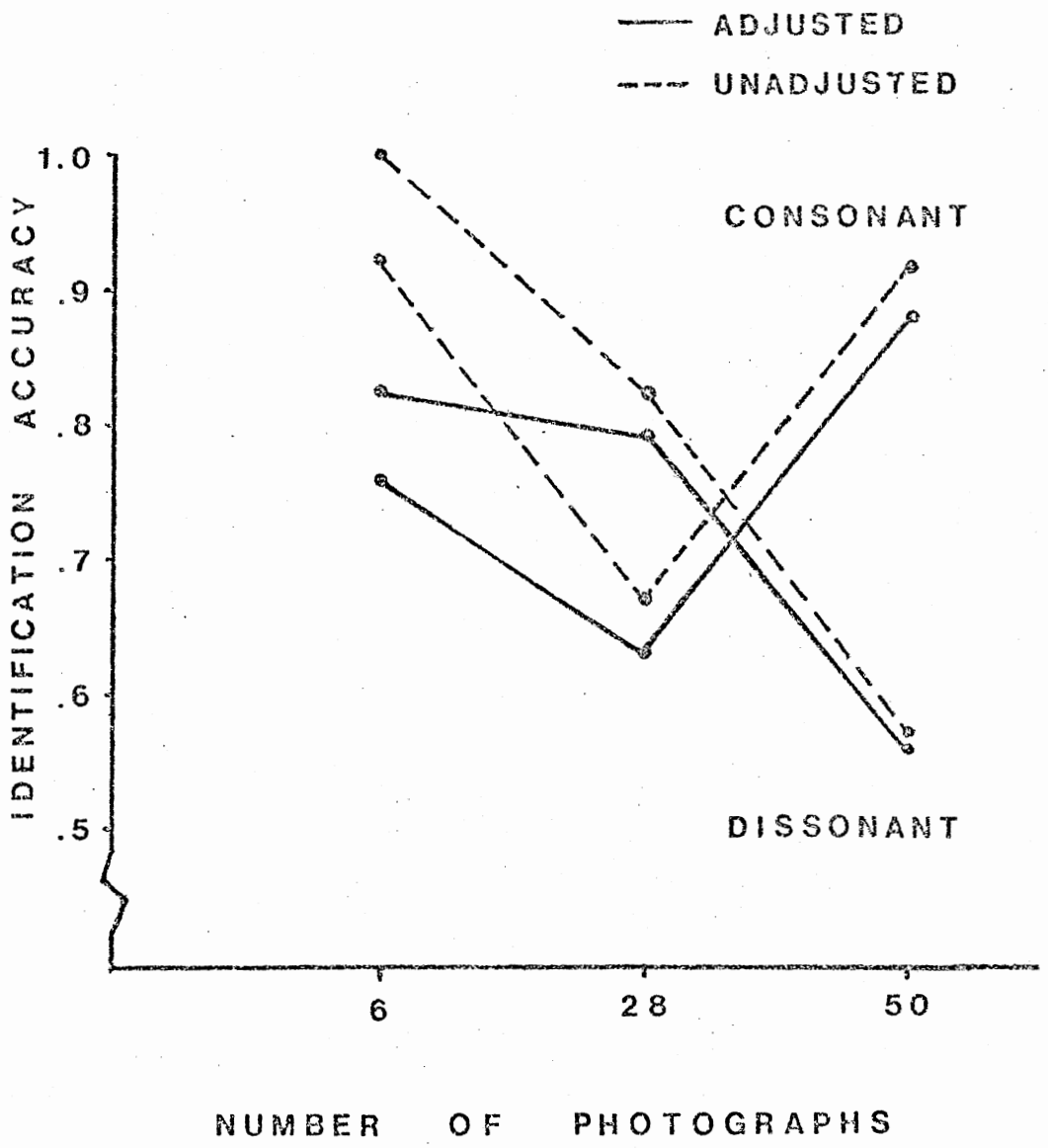

Figure 1. Number of Photographs X Facial Expression Interaction (Adjusted and Unadjusted)

similarity, consonant expression condition (5.33).

Correlational analyses indicated that subjects' confidence estimates were significantly negatively correlated with identification time, $r = -.39$, $df = 59$, $p < .003$. Thus, confidence in one's identification is related to how quickly that identification is made--the quicker the identification, the greater one's confidence in it. Subjects' estimates of confidence were also found to correlate with the "alert" item on Byrne's Affectance Arousal Scale, $r = .46$, $df = 59$, $p < .0002$. Subjects who rated themselves as "alert" during the encounter with the suspect consequently were fairly confident in their selection of a suspect's photograph.

Several nonsignificant correlations may also be of interest. Confidence in one's photograph selection did not correlate with Byrne's item "confident", $r = -.07$, $df = 59$, ns. Apparently, confidence did not generalize in this case, but can be viewed as being appropriate to the situation. Additionally, the number of categories and adjectives used during the free recall description did not correlate with the estimate of confidence in one's photograph selection, $r = -.05$, $df = 59$, ns; $r = .12$, $df = 59$, ns, respectively, although these did correlate with the accuracy of the identification.

Identification Time

All subjects were unobtrusively timed from the beginning of the identification procedure until they began writing on the identification form. Subjects were informed that they could look at the deck of photographs as many times as desired and most, in fact, did search through the deck more than once. This variable, identification time,

therefore, is not a measure of the time required to merely flip through a certain number of photographs, but rather an estimate of the time actually required to search the photographs and make (or fail to make) an identification.

The analysis indicated that the number of photographs viewed had a significant effect on the length of time required to make an identification, F (2, 60) = 7.82, $p < .001$. Decision making was shortest with 6 photographs (1 min. 21 sec.) followed by 28 photographs (2 min. 54 sec.) and 50 photographs (4 min. 48 sec.). Trend analysis revealed a significant linear component in the data, F (1, 60) = 15.60, $p < .001$, and a nonsignificant quadratic component, F (1, 60) = .05, ns. The linear component accounted for 99.67% of the variation.

The degree of similarity present among the various photographs was marginally significant, F (1, 60) = 3.55, $p < .06$, and the means were in the predicted direction. High similarity photographs took longer (3 min. 42 sec.) to identify than did low similarity photographs (2 min. 21 sec.). Although nonsignificant, the means for the expression variable were in the predicted direction. When the target's expression was consonant with the distractors, identification took an average of 3 min. 09 sec.; when a dissonant expression was present, identification required only 2 min. 53 sec. on the average.

Several significant correlations involving identification time are of interest. As previously reported, identification time was negatively correlated with both identification accuracy and subject's confidence estimate, $r_{pb} = -.55$, df = 71, $p < .0001$; $r = -.39$, df = 59, $p < .003$, respectively. Thus, relatively accurate and confident identifications were generally made more quickly than less

accurate and confident selections.

Significant correlations occurred between identification time and the number of categories, $r = -.39$, $df = 71$, $p < .0007$, and the number of adjectives, $r = -.33$, $df = 69$, $p < .005$, used by the subjects during the free recall description. Subjects who gave "better" descriptions (ie., more categories and more adjectives) tended to make faster identifications 1 week later than subjects who gave "poorer" descriptions.

Affectance Arousal Scale

Following the encounter with the suspect and the policeman's interview of the eyewitness, the experimenter returned and administered Byrne's Affectance Arousal Scale, or the "Mood Check List." Several items from the Mood Check List were designated as key items because they may reflect emotions experienced during the eyewitness encounter which would be salient to an understanding of the factors that influence an eyewitness account. The individual statements selected for additional analysis were "confident," "stimulated," "alert," and "aroused." For correlations among these items, see Table II.

One-half of the items on the Mood Check List can be summed as an overall estimation of "positive affectance arousal," while the remaining items reflect "negative affectance arousal." Both positive and negative affect highly correlated with the sum of Mood Check List scores, $r = .73$, $df = 72$, $p < .0001$; $r = .56$, $df = 72$, $p < .0001$, respectively, but were not themselves significantly correlated, $r = -.13$, $df = 72$, ns. The sum of the negative affect

items was significantly correlated with the target interaction time, $r = -.26$, df = 72, $p < .02$. The longer the suspect interacted with the eyewitness, the lower the degree of negative affect experienced by the witness.

Table II

Correlation Coefficients for Selected Items from the Affectance Arousal Scale

	Confident	Stimulated	Alert	Aroused
Confident	--	-.09	.17	-.04
Stimulated		--	.16	.47**
Alert			--	.31*

* $p < .008$
** $p < .0001$

Target Effects

Three different target suspects participated in the experiment in order to control for a confederate's idiosyncratic behavior or any outstanding features and to increase generalizability. An analysis of variance indicated a significant suspect effect on identification accuracy, F (2, 71) = 3.68, $p < .03$, although identification confidence and identification time were nonsignificant, F (2, 58) = .85, ns; F (2, 70) = 1.99, ns, respectively. Thus, the accuracy of an identification was affected by the particular individual serving as the suspect. Although particular suspects were correctly identified more frequently than others, witnesses were not more confident of these selections, and the identifications were not made faster.

Facial Expression Variations

T-tests were computed to test differences between the facial expressions of the target and the distractor photographs. Target expression was either consonant or dissonant with the distractors. In the consonant condition, suspect and distractors had similar expression--essentially, neutral or "no expression." In the dissonant condition, target and distractors had dissimilar expressions. The distractors were also neutral, but the suspect's expression was either a smile or a frown. Thus, his facial expression was either more positive or more negative than the distractors. T-tests were computed for the three main dependent variables--identification accuracy, identification confidence, and identification time. No significant differences between expressional variations were found for any of the dependent variables.

Identification Accuracy

Results for identification accuracy were opposite of the predicted direction. Although absolute differences were small, greatest accuracy was found in the neutral (consonant) condition, followed by smile and frown conditions.

Identification Confidence

Although nonsignificant, the mean confidence estimates were ordered differently than the accuracy means. Witnesses in the smile condition were most confident of their choices, followed by ones in the frown condition, and finally ones in the neutral condition.

Thus, while eyewitnesses were most accurate in the neutral condition, they were least confident of their choice.

Identification Time

Although mean differences were also nonsignificant, identification time means were ordered differently again. Identifications were made most quickly in the frown condition, followed by the smile and neutral conditions.

Suspect Description

Physical Characteristics

Height and Weight Estimates. Table III includes each target/suspect's actual height and weight and the eyewitnesses' estimations. The overall average closely resembles that of the typical male college student. Eyewitnesses' estimates of height and weight were strongly correlated, $r = .43$, $df = 72$, $p < .0001$.

Age. Witnesses tended to underestimate the age of the suspect, although they were relatively accurate. The three suspects were all 22 years old. The average age estimation by eyewitnesses for all three suspects was 21.4 years, with a range from 19 to 32 years. A significant correlation was found only for the witnesses' estimate of interaction duration and suspect age, $r = .34$, $df = p < .003$. The longer the witnesses' estimation of the interaction with the suspect, the older the suspect was described as being, although the correlation between the actual interaction length and target age was nonsignificant, $r = .09$, $df = 72$, ns.

Table III

PHYSICAL CHARACTERISTICS OF SUSPECTS

TARGET	Height		Weight		Age	
	Actual	Estimated	Actual	Estimated	Actual	Estimated
1	5'10"	5'9"	140	153.0	22	21.0
2	5'9"	5'10"	150	153.5	22	21.4
3	5'7"	5'7"	150	154.4	22	21.9
Mean Estimates		5'8"		153.7		21.4

Adjectives and Categories. All description forms and tapes of the free recall phase were analyzed to detect both the number of adjectives and categories volunteered by the witnesses. For example, a description such as "tall, blonde hair, short-sleeved blue shirt, and blue jeans" would be coded as five adjectives (tall, blonde, short-sleeved, blue, and blue jeans) and three categories (hair, shirt, and pants). "Tall" does not provide enough information to qualify as a descriptive category, although 5 feet, 10 inches would qualify.

Only the adjectives and categories volunteered during the free recall description were analyzed. Over all conditions, subjects described an average of 4.5 categories while using 3.5 adjectives. The range was from 1 to 8 for both variables. Obviously, the number of categories and adjectives were positively correlated, $r = .71$, $df = 72$, $p < .0001$. Both variables were also found to be positively correlated with identification accuracy, $r = .36$, $df = 72$, $p < .002$; $r = .30$, $df = 72$, $p < .01$, respectively. Thus, accurate identifications were associated with relatively larger numbers of both

categories and adjectives. Additionally, identification time was significantly negatively correlated with both the number of categories, $r = -.39$, $df = 72$, $p < .0007$, and the number of adjectives, $r = -.33$, $df = 72$, $p < .005$, volunteered by the subjects. The more categories used by a subject, the less the time needed to make an identification 1 week later. In spite of these significant correlations, categories and adjectives were not correlated with the subjects' confidence in their identification, $r = .05$, $df = 59$, ns; $r = .12$, $df = 59$, ns, respectively.

Additionally, two of the key Mood Check List items are apparently related in some way to the description categories and adjectives. The item "anxious" was significantly correlated with both categories, $r = .29$, $df = 72$, $p < .01$, and adjectives, $r = .28$, $df = 72$, $p < .02$; the item "aroused" significantly correlated with the number of categories, $r = .27$, $df = 72$, $p < .02$, but not the number of adjectives, $r = .14$, $df = 72$, ns. Thus, in three of four cases, relatively high levels of anxiety and arousal were associated with larger numbers of descriptive categories and adjectives. It may be of interest to note that neither categories nor adjectives correlated with the arousal of either total positive affect, $r = .09$, $df = 72$, ns; $r = .08$, $df = 72$, ns, respectively, or total negative affect, $r = .22$, $df = 72$, ns; $r = .07$, $df = 72$, ns, respectively. The number of categories and total negative affect were marginally significant, $p < .07$.

Time Estimates

All suspect--witness interactions were timed by stopwatch from the instant the target entered the pawnshop until the quick "getaway."

These interactions ranged from 1 min. 38 sec. to 3 min. 45 sec. with an average of 2 min. 25 sec. Additionally, subjects were asked during the suspect description phase to estimate the duration of their interaction with the target ("About how long was he in the room with you?"). The estimates ranged from 1 min. to 8 min. with a mean of 4 min. 7 sec. With the mean estimate greater than the longest actual interaction, witnesses obviously tended to overestimate the interaction length. On the average witnesses overestimated by 1 min. 41 sec. Only 8 of 72 witnesses gave an estimate less than the actual interaction length and one-half were within 30 seconds of the actual length. Both variables--actual interaction time and estimated interaction time--will therefore be reported.

The actual interaction time and the estimated time were positively correlated, $r = .26$, $df = 72$, $p < .03$. The actual length was also found to be associated with two related items from the Mood Check List. Negatively correlated with the actual interaction duration were both the "anxious" item, $r = -.25$, $df = 72$, $p < .04$, and the "uneasy" item, $r = -.32$, $df = 72$, $p < .006$. These two items intuitively seem related and were found to be correlated, $r = .25$, $df = 72$, $p < .04$. These variables, however, did not correlate with the witnesses' estimation of the interaction duration, $r = -.04$, $df = 72$, ns; $r = -.02$, $df = 72$, ns, respectively. The actual interaction time variable also correlated with the sum of the negative affect items from the Mood Check List, $r = -.26$, $df = 72$, $p < .02$, but not the positive affect items, $r = .12$, $df = 72$, ns. Apparently, the longer interaction were in some way related to the easing or lowering of negative affect, especially in regard to "anxiety" or "uneasiness."

Positive and Negative Affectance Arousal

The arousal of negative affect was associated with identification accuracy, $r = .23$, $df = 72$, $p < .05$. The greater the degree of negative affect, the more accurate the identification. Negative affect and the actual interaction duration were also significantly correlated, $r = -.26$, $df = 72$, $p < .02$. Thus, the longer the target was actually in the pawn shop, the less the degree of negative affect aroused. No major dependent variables correlated with positive affectance arousal.

Without exception, each of the 16 individual Mood Check List items was significantly positively correlated with the appropriate positive or negative affectance arousal. Additionally, both positive and negative affect positively correlated with the sum of Mood Check List items, $r = .73$, $df = 72$, $p < .0001$; $r = .56$, $df = 72$, $p < .0001$, respectively. Although the correlation between positive and negative affectance arousal was in the appropriate direction, it was nonsignificant, $r = -.13$, $df = 72$, ns.

CHAPTER VI

DISCUSSION

Eighty-two percent of the subjects in the present study were able to correctly identify the target with whom they had interacted. Conversely stated, nearly 20% of witnesses could not identify, 1 week later, a suspect they had viewed face-to-face for approximately 2 1/2 minutes, under near optimal conditions. Although the 82% accuracy rate is comparable to, or even higher than that of similar eyewitness studies (Brown, Deffenbacher, & Sturgill, 1977; Covey, 1977; Egan, Pittner, & Goldstein, 1977; Johnson & Scott, 1975, 1976; Laughery et al., 1971, 1972, 1974; Scott, Edwards, Carpenter, King, & Schmid, 1977; Williams & Chomiak, 1978), it is still less than the typical +90% rates for pictorial memory reported by Haber (1970), Nickerson (1965), and Shepard (1967). The rate is also lower than those reported for facial recognition by Hochberg and Galper (1967), Galper and Hochberg (1971), and Yin (1969), all of whom report +90% accuracy rates.

Although the current rate is higher than that in some similar eyewitness studies, this study was designed to be of moderate arousal in comparison to the others. The interaction between the eyewitness and the suspect was designed to be very business-like for the most part, until the suspect was refused his offer, shoplifted the item,

and quickly ran from the pawnshop. Thus, while in the end, the interaction may have been arousing, the witness interacted with the suspect for nearly 2 minutes in an unarousing manner. Success at achieving a "moderate" level of stress is supported by witnesses' responses to key Mood Check List items. On a 5-point scale from "not at all" (1) to "extremely" (5), the means for "anxious," "stimulated," and "aroused" were 2.6, 2.9, and 3.1, respectively.

The hypothesis that greater accuracy would occur among witnesses who freely recalled relatively broad descriptions was supported for both description categories and number of adjectives used. This association was reported in a previous study (Covey, 1977). Thus, an eyewitness' subsequent identification of a suspect appears to be associated with the quality and breadth of the initial description. Those witnesses who, shortly after the original incident, were able to freely recall several description categories and used several adjectives, were more likely to make an accurate identification one week later than witnesses who were initially able to recall and describe little of the suspect. This appears to indicate that an identification is not influenced as much by decay of memory with the passage of time, at least for periods up to one week, as by any interference during the initial perception of the suspect and the eyewitness' subsequent ability to describe him. This would tend to support previous findings of Laughery et al. (1974) and Egan et al. (1977) in which identification accuracy was minimally affected over periods up to 1 week and 8 weeks, respectively.

In this study, the 13 subjects who made incorrect identifica-

tions freely recalled an average of 3.4 categories and 2.5 adjectives as compared to 4.8 categories and 3.7 adjectives for witnesses who were successful at identifying the suspect. These figures are somewhat lower than those reported in a previous study (Covey, 1977), but the differences between correct and incorrect identifications are comparable.

Although several police departments and the "Identi-Kit" manual claim that witnesses have a photographic memory for a suspect that is not necessarily based on a verbal description, findings of the present study tend to support an alternative hypothesis. A witness' subsequent identification appears to be based on the quality (number of adjectives) and breadth (number of categories) of the initial, immediate description.

The hypothesis that identification accuracy would be greater with the fewer the number of photographs shown was not supported. The means for this variable, however, were in the predicted direction. The non-significance found for this variable was mainly due to the two larger sets of photographs. When left unadjusted for guessing, the accuracy rates for 28 and 50 photographs (.75 with 0 = Miss and 1 = Hit) were comparable, with accuracy best in the 6 photograph condition (.96). When the analysis was adjusted for guessing, accuracy was still best in the 6 photograph condition (.80), followed by near equal values (the differences being due to the differential guessing rate) for 50 photographs (.74) and 28 photographs (.72). The number of photographs shown to the witness, therefore affected identification accuracy only up to a point. Although accuracy rates for 28 and 50 photographs were comparable (even when adjusted for guessing),

accuracy was best for the smallest set of photographs. In other words, whereas a practical and effective upper limit on the number of photographs necessary to show a witness may be reached, identification may still be affected by extreme lower numeric limits. This study would indicate that a value greater than 6 photographs and definitely less than 50 (in other words, some value near or somewhat less than 28) would appear to render a fair, and sufficient test of a witness' ability to identify a suspect. This intermediate value would be more rigorous than the 6 photograph condition (96% accuracy when unadjusted) and would not be unnecessarily large as in the 50 photograph condition.

Results of this study partially replicate previous findings reported by Laughery et al. (1971). Although in the test phase, subjects viewed 150 photographs with the target at either position 40 or 140, they concluded that the more photographs a witness views, the less likely a positive identification will be made. In a similar study, Laughery et al. (1974) reported that this effect is most likely due to interference of intervening photographs rather than the decay of memory traces with the passage of time.

The relative similarity of the distractors and target photographs was expected to affect identification accuracy. Although means were in the predicted direction, the hypothesis was not supported. Identifications were less accurate, when either adjusted or unadjusted for guessing, in the high similarity condition (.68 and .75, respectively) than in the low similarity condition (.82 and .89, respectively). One explanation for the failure of this variable may be due to the lack of difference between the relative levels of similarity. In spite of many differences in facial similarity

between the two groups, all photographs were of white male college students between the ages of 18 and 25. Thus, while some features may be distinctly dissimilar, other characteristics, such as age, may be similar. Significant effects due to facial similarity may be achieved by increasing the relative degree of dissimilarity by securing a greater range of distractor photographs in terms of age, physical attractiveness, facial scars, etc.

The hypothesis that identification accuracy would vary as a function of the Number of Photographs X Facial Similarity interaction was not supported. In the 6 photograph condition, accuracy was somewhat better for high similarity (.83) than for low similarity (.76). Thus, the means were opposite of the predicted direction. Mean accuracy scores were greater for low similarity than high similarity in both the 28 photograph (.88 to .56) and 50 photograph conditions (.82 to .65). Apparently, differential degrees of similarity are less important when a witness is viewing a small, rather than a large set of photographs. With only 6 photographs to inspect, perceived similarity between target and distractors may be less critical than in the 28 or 50 photograph conditions, where accurate identification is more easily affected by an increased degree of similarity.

Identification accuracy was expected to vary as a function of the Facial Similarity X Expression interaction. This hypothesis was not supported. In the high similarity condition, although the mean differences were small, adjusted accuracy was greater for the consonant condition (.71) than for the dissonant expression (.66), which is opposite of the predicted direction. The prediction that accuracy

would not be significantly affected by either facial expression in the low similarity condition was supported by the virtually equivalent scores for the consonant (.83) and the dissonant expressions (.82). Facial expression, however did interact with the number of photographs variable. Simple effects test (adjusted for guessing) indicated that expressional variation made a difference only in the 50 photograph condition. Unadjusted analysis indicated that, in addition to this finding, identification accuracy was better when a smaller set of photographs were viewed, but only for dissonant expressions. Facial expression apparently then does have an affect on an eyewitnesses' identification, but the significant interaction indicates some qualification must be made regarding this variable. In summary, it would appear that the degree of similarity, including facial expression variation, must be considered along with the number of photographs when preparing a mugshot test for an eyewitness. If a large group of mugshots (for example, 50) can be readied, relative similarity of photographs would be of less concern due to the number of interfering photographs. But if for some reason, there is difficulty in assembling a large selection of photographs, then similarity of the photographs is of relatively greater importance and special attention should be paid to insuring that the photographs are adequately distractive.

The hypothesis that identification accuracy would be greater for dissonant than consonant expressions was not supported. Although absolute differences were extremely small, the means were opposite of the predicted direction. Accuracy was slightly higher for consonant expressions (.77) than for dissonant expressions (.74). Additionally, overall results indicated no significant differences for accuracy

between the smile, frown, and neutral expression. Thus, the a priori prediction were not supported. As previously noted, facial expression, by itself, appears to be of little effect on identification accuracy. Any effects due to expression must be interpreted in view of the significant Expression X Number of Photographs interaction. As Galper and Hochberg (1971) reported, expressional variation plays a role in facial recognition, although the characteristics that may differ have not yet been specified. This would seem to be an area of further research possibilities for facial recognition studies.

The nonsignificant correlation found for identification accuracy and confidence has also been reported by Buckhout (1974) and Brown et al. (1977). The present study, however, indicated that identification confidence was significantly correlated with the amount of time needed to make that identification. Apparently subjects rated themselves as confident if they made a relatively quick identification, irregardless of its accuracy. This would appear to be of significance to criminal investigators. Traditionally, a "confident" witness has been assumed to be more accurate than an "unconfident" witness. However, witnesses may make an evaluation of self-confidence on factors other than their perceived accuracy of identification.

BIBLIOGRAPHY

Alexander, J. F. Search factors influencing personal appearance identification. In A. Zavala & J. J. Paley (Eds.), Personal appearance identification. Springfield, Ill.: C. C. Thomas, 1972.

Allison, H. C. Personal identification. Boston: Holbrook Press, 1973

Borchard, E. M. Convicting the innocent, errors of criminal justice. New York: De Capo Press, 1970.

Brown, E., Deffenbacher, K., & Sturgill, W. Memory for faces and the circumstances of encounter. Journal of Applied Psychology, 1977, 62, 311-318.

Buckhout, R. Eyewitness testimony. Scientific American, 1974, 231, 23-31.

Covey, K. H. The effects of environmental setting on eyewitness identification. Unpublished manuscript, 1977.

Cross, J. F., Cross, J., & Daly, J. Sex, race, age and beauty as factors in recognition of faces. Perception and Psychophysics, 1971, 10, 393-396.

Egan, D., Pittner, M., & Goldstein, A. G. Eyewitness identification, photographs vs. live models. Law and Human Behavior, 1977, 1, 199-206.

Ellis, H. D., Shepard, J., & Bruce, A. The effects of age and sex upon adolescents recognition of faces. Journal of Genetic Psychology, 1973, 123, 173-174.

Ellis, H. D. Recognizing faces. British Journal of Psychology, 1975, 66, 409-426.

Galper, R. E. & Hochberg, J. Recognition memory for photographs of faces. American Journal of Psychology, 1971, 84, 351-354.

Goldstein, A. G. & Chance, J. E. Visual recognition memory for comple comples configurations. Perception and Psychophysics, 1970, 9, 237-241.

Goldstein, A. G. The fallibility of the eyewitness. Unpublished manuscript, 1977.

Haber, R. N. How we remember what we see. Scientific American, 1970, 222, 104-112.

Hochberg, J. & Galper, R. E. Recognition of faces: an exploratory study. Psychonomic Science, 1967, 9, 619-620.

Howells, T H. A study of ability to recognize faces. Journal of Abnormal and Social Psychology, 1938, 33, 124-127.

Johnson, C. & Scott, B. The effects of arousal on the cognitive processing of information in an eyewitness setting. Paper presented at the American Psychological Association Convention, Chicago, August 1975.

Johnson, C. & Scott, B. Eyewitness testimony and suspect identification as a function of arousal, sex of witness, and scheduling of interrogation. Paper presented at the American Psychological Association Convention, Washington, September 1976.

Lane, A. B. Effects of pose position on identification. In A. Zavala & J. Paley (Eds.), Personal appearance identification. Springfield, Ill.: C. C. Thomas, 1972.

Laughery, K. R., Alexander, J. F., and Lane, A. B. Recognition of human faces: Effects of target exposure time, target position, pose position, and type of photograph. Journal of Applied Psychology, 1971, 55, 477-483.

Laughery, K. R. Photograph type and cross-racial factors in facial identification. In A. Zavala & J. J. Paley (Eds.), Personal appearance identification. Springfield, Ill.: C. C. Thomas, 1972.

Laughery, K. R., Fessler, P. K., Lenorovitz, D. R., & Yoblick, D. A. Time delay and similarity effects in facial recognition. Journal of Applied Psychology, 1974, 59, 490-496.

Levine, F. J. & Tapp, J. L. The psychology of criminal identifications: The gap from Wade to Kirby. University of Pennsylvania Law Review, 1973, 121, 1079-1131.

Loftus, E. Incredible Eyewitness. Psychology Today, 1974, 8, 117-119.

Marshall, J. Law and psychology in conflict. New York: Bobbs-Merrill, 1966.

Munsterberg, H. On the witness stand. New York: McClure, 1908.

Nickerson, R. S. A note on long-term recognition memory for pictorial material. Psychonomic Science, 1968, 11, 58.

Patterson, K. E. & Baddeley, A. D. When face recognition fails. Journal of Experimental Psychology: Human Learning and Memory, 1977, 3, 406-417.

Scott, B., Edwards, K., Carpenter, J., King, S., & Schmid, L. Photographic identification of a white, male defendant as function of witnesses' arousal. Paper presented at the meeting of the American Psychology--Law Society Conference, Snowmass, Colorado, June 1977.

Sussman, E. D., Sugarman, R. C., & Zavala, A. A comparison of three media used in identification procedures. In A. Zavala & J. J. Paley, (Eds.), Personal appearance identification. Springfield, Ill.: C. C. Thomas, 1972.

Wall, P. M. Eyewitness identification in criminal cases. Springfield, Ill.: C. C. Thomas, 1965.

Williams, D. & Chomiak, A. Photographic identification of a white male as a function of a witnesses' preparedness to observe, level of arousal, and sex. Paper presented at the Society for Police and Criminal Psychologists, Dallas, Texas, October, 1978.

Zavala, A. & Paley, J. J. (Eds.) Personal Appearance identification. Springfield, Ill.: C. C. Thomas, 1972.

APPENDIX A

DESCRIPTION FORM

WITNESS:
- Name:
- Address:
- Phone number:
- Age:

SUSPECT:
- Race:
- Sex:
- Age:
- Height:
- Weight:
- Hair:
  - Color:
  - Length:
  - Style:
  - Facial:
- Eyes:
- Clothing:
  - Shirt:
  - Pants:
  - Shoes:
  - Coat:
  - Jewelry:
- Distinguishing features:
- Verbal comments:
- Interaction Duration:

APPENDIX B

IDENTIFICATION FORM

I, _____, the undersigned, on the _____ day of _____, 19_____, did willfully and lawfully identify a photograph of the individual who, at some prior date, did:

The photograph I have chosen is identified by the code number: _____

I can judge my confidence in this identification to be:
(please circle the appropriate point)

Very low confidence • • • • • • • Very high confidence

I, _____ , the undersigned, on the _____day of _____, 19_____, was unable to make a positive identification from the photographs I was shown.

I have examined the statements in the foregoing information and find them, to the best of my knowledge, factual.

_____
complaining witness

_____
District Attorney

APPENDIX C

AFFECTANCE AROUSAL SCALE

Please read each of the 16 items presented in this booklet carefully. Place a check mark (✓) next to the alternative which most closely describes your mood or feelings.

---

1. Entertained (check one)

   __1__ Not at all entertained
   _____ Slightly entertained
   _____ Moderately entertained
   _____ Entertained
   __5__ Quite entertained

2. Disgusted (check one)

   __1__ Not at all disgusted
   _____ Slightly disgusted
   _____ Moderately disgusted
   _____ Disgusted
   __5__ Extremely disgusted

3. Unreality (check one)

   __5__ Strong feeling of unreality
   _____ Feelings of unreality
   _____ Moderate feelings of unreality
   _____ Slight feelings of unreality
   __1__ No feelings of unreality

4. Anxious (check one)

   __1__ Not at all anxious
   _____ Slightly anxious
   _____ Moderately anxious
   _____ Anxious
   __5__ Extremely anxious

5. Bored (check one)

__1__ Extremely bored
_____ Bored
_____ Moderately bored
_____ Slightly bored
__5__ Not at all bored

6. Uneasy (check one)

__1__ Not at all uneasy
_____ Slightly uneasy
_____ Moderately uneasy
_____ Uneasy
__5__ Quite uneasy

7. Confused (check one)

__1__ Not at all confused
_____ Slightly confused
_____ Moderately confused
_____ Confused
__5__ Quite confused

8. Curiosity (check one)

__5__ Strong curiosity
_____ Curiosity
_____ Moderate curiosity
_____ Slight curiosity
__1__ No curiosity

9. Confident (check one)

__5__ Not at all confident
_____ Slightly confident
_____ Moderately confident
_____ Confident
__1__ Extremely confident

10. Intellectually challenged (check one)

__5__ Strongly challenged intellectually
_____ Intellectually challenged
_____ Moderately challenged intellectually
_____ Slightly challenged intellectually
__1__ Not at all challenged intellectually

11. Stimulated (check one)

__1__ Not at all stimulated
_____ Slightly stimulated
_____ Moderately stimulated
_____ Stimulated
__5__ Extremely stimulated

12. Interested (check one)

__5__ Extremely interested
_____ Interested
_____ Moderately interested
_____ Slightly interested
__1__ Not at all interested

13. Alert and eager (check one)

__5__ Not at all alert and eager
_____ Slightly alert and eager
_____ Moderately alert and eager
_____ Alert and eager
__1__ Extremely alert and eager

14. Depressed (check one)

__1__ Not at all depressed
_____ Slightly depressed
_____ Moderately depressed
_____ Depressed
__5__ Extremely depressed

15. Aroused (check one)

__1__ Not at all aroused
_____ Slightly aroused
_____ Moderately aroused
_____ Aroused
__5__ Extremely aroused

16. Disturbed (check one)

__1__ Not at all disturbed
_____ Slightly disturbed
_____ Moderately disturbed
_____ Disturbed
__5__ Extremely disturbed

APPENDIX D

MEAN TABLES FOR ANALYSIS OF VARIANCE

	A Photographs			B Similarity		C Expression	
	6	28	50	High	Low	Cons.	Diss.
SUSPECT IDENTIFICATION							
Adjusted Accuracy	.80	.72	.74	.68	.82	.77	.74
Unadjusted Accuracy	.96	.75	.75	.75	.89	.83	.81
Confidence	6.0	6.6	6.3	6.0	6.4	6.1	6.4
Time	1:21	2:54	4:48	3:41	2:20	3:08	2:53

	A X B						A X C						B X C			
	Photographs			Similarity			Photographs		Expression				Similarity		Expression	
	6Hi	6Lo	28Hi	28Lo	50Hi	50Lo	6C	6D	28C	28D	50C	50D	HiC	HiD	LoC	LoD
SUSPECT IDENTIFICATION																
Adjusted Accuracy	.83	.76	.56	.88	.65	.82	.76	.83	.64	.80	.90	.57	.71	.66	.83	.82
Unadjusted Accuracy	1.0	.92	.58	.92	.67	.83	.92	1.0	.67	.83	.92	.58	.78	.72	.89	.89
Confidence	5.7	6.3	6.6	6.5	6.1	6.4	5.8	6.1	6.1	6.9	6.3	6.3	5.8	6.3	6.3	6.5
Time	1:13	1:29	3:34	2:05	6:07	3:28	1:16	1:26	3:29	2:19	4:40	4:55	3:52	3:30	2:24	2:17

	A X B X C											
	PHOTOGRAPHS SIMILARITY EXPRESSION											
	6HiC	6HiD	6LoC	6LoD	28HiC	28HiD	28LoC	28LoD	50HiC	50HiD	50LoC	50LoD
SUSPECT IDENTIFICATION												
Adjusted Accuracy	.83	.83	.69	.83	.48	.64	.80	.96	.82	.49	.98	.65
Unadjusted Accuracy	1.0	1.0	.83	1.0	.50	.67	.83	1.0	.83	.50	1.0	.67
Confidence	5.3	6.0	6.4	6.2	6.33	6.75	6.0	7.0	6.0	6.3	6.5	6.25
Time	1:20	1:06	1:12	1:46	4:18	3:09	2:39	1:30	5:59	6:16	3:22	3:35

VITA 2

Keith Howard Covey

Candidate for the Degree of

Master of Science

Thesis: EYEWITNESS IDENTIFICATION AS A FUNCTION OF THE NUMBER OF PHOTOGRAPHS VIEWED AND THE DEGREE OF FACIAL SIMILARITY AND CONGRUENCY AMONG EMOTIONAL EXPRESSIONS

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