PERCEPTION OF THE SIMULANT-AMPUTEE PHYSIQUE

A Thesis

Presented to

the Faculty of the Department of Psychology

University of Houston

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

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by

Andrew Thomas Abell

August 1958

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ABSTRACT

It was the purpose of this study to determine whether or not perception of the simulant-amputee physique of the male, hereafter called amputee, is threatening to the nondisabled male. The following hypotheses were suggested by a review of the literature on perceptual defense and the galvanic skin response (GSR):

I. Recognition thresholds are higher for tachistoscopically-presented slides of amputees in usual clothing than for tachistoscopically-presented slides of nondisabled males in novel clothing.

II. Tachistoscopically-presented slides of amputees in usual clothing are seen as pictures of nondisabled persons in novel clothing more often than tachistoscopically-presented slides of nondisabled males in novel clothing are seen as pictures of amputees in usual clothing.

III. At three levels of perception, i.e., immediately below the recognition threshold, approximately at the recognition threshold, and far above the recognition threshold, there is greater arousal on the emotional activity continuum, as measured by the GSR, to tachistoscopically-presented slides of amputees in usual clothing than to tachistoscopically-presented slides of nondisabled males in novel clothing.

Each of 32 nondisabled male subjects was presented tachistoscopically and in sequence slides of four different amputees in usual clothing and slides of four different nondisabled males in novel clothing. Recognition thresholds of each subject for each slide were established, and

pre-recognition responses of each subject were recorded. After a subject's recognition thresholds were determined, the series of eight slides was presented once again but far above threshold. A subject's GSR to each slide at each of the three levels of perception was determined.

None of the three hypotheses was confirmed by the data. On the contrary, chi-square tests of the first and second hypotheses showed significant differences in the directions opposite to the hypotheses: the thresholds were higher to the nondisabled slides than to the amputee slides, and the nondisabled slides were seen as pictures of amputees more often than the amputee slides were seen as pictures of the nondisabled in novel clothing. An analysis of variance test of the third hypothesis revealed no significant difference in emotional arousal to the two types of slides.

In this study, there was no evidence, therefore, that perception of the amputee is threatening to the nondisabled male. However, it was difficult to interpret the results because of three possible sources of difference between the amputee slides and the nondisabled slides, i.e., differences in clue aspects, differences in novelty, and differences in threat-producing character. The investigator believed the obtained results may be attributed to differences in clue aspects and novelty between the two types of slides.

It was suggested that in future investigations greater effort must be made to equate clue aspects and novelty of amputee and nondisabled slides. Suggestions for accomplishing this were made.

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CHAPTER I

INTRODUCTION

There is some relation between physical disability and psychological maladjustment. It has been reported that the physically disabled are maladjusted more often than the nondisabled and that persons with severe disabilities have greater problems of adjustment than those with less severe disabilities (3). Amputees are individuals who are classified often among the severely disabled. It would be reasonable to suppose that amputees are maladjusted more often than the nondisabled.

A difference in adjustment between amputees and the nondisabled surely reflects differences in behavioral experiences between the two groups. Frustration attendant upon the physical limitation of behavior caused by the loss of a limb is one way in which the experiences of amputees differ from those of the nondisabled. A more important difference would seem to be a difference in interpersonal experiences, e.g., amputees may be avoided by other persons more often than the nondisabled.

To assume that amputees tend to be avoided by other persons is to be faced with the question of why? Perhaps amputees are avoided because perception of them is "threatening." For example, emotional and avoidance responses which

are conditioned to the perception of injury to one's own body are generalized possibly to the perception of injury to others. The results of a study by Wittreich and Radcliffe (37) may be interpreted as lending support to the assumption that perception of the amputated physique is threatening.

Wittreich and Radcliffe established "'distortion thresholds'" for 12 nondisabled male subjects who viewed a nondisabled male through aniseikonic lenses in two different experimental states: in one state the observed male appeared normal, and in the other state he simulated an amputee. A series of 14 aniseikonic lenses of progressively greater power were used to establish the distortion thresholds. The distortion threshold of a subject for the observed individual in a given experimental state was the number of the lens, from 1 through 14, which was being used when a change in the appearance of the observed individual was first reported by the subject. The distortion thresholds of the subjects when viewing the simulant amputee were significantly greater than when viewing the normal figure. In effect the simulant amputee appeared less distorted than the normal figure.

The results of the Wittreich and Radcliffe study may reflect differential emotional-motivational reactions of the nondisabled subjects to the two types of figures. Wittreich

and Radcliffe hesitated to interpret their results but suggested that a difference in the "interpersonal relationship" of a subject with disabled and nondisabled persons might be involved. Meyerson suggested that the Wittreich and Radcliffe results could possibly have occurred because of " . . . a generalized resistance toward perceiving mutilation that is dynamically similar to the resistance toward perceiving other types of 'threatening' visual stimuli" (28, p. 451).

It was the purpose of this study, in conjunction with a study by Duncan (8), to determine whether or not perception of the simulant-amputee physique[1] of the male is threatening to the nondisabled male.[2] The hypotheses and techniques used for the investigation of the problem were suggested largely by a review of the literature on perceptual defense and on the galvanic skin response (GSR).

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[1] There were two main reasons for the use of physiques of simulant amputees rather than actual amputees. First, nondisabled persons, who could be made to simulate amputees, were more available than actual amputees. Second, the investigators desired to counterbalance differences between observed physiques other than differences in body completeness. This can be done by using the same individual as a model for a picture of an amputee and for a picture of a nondisabled person. Making an amputee of a nondisabled person by photographic techniques is easier than making a nondisabled person of an amputee by photographic techniques.

[2] Only male subjects and the male physique were considered in the study in order to delimit the complexity of the study.

CHAPTER II

REVIEW OF THE LITERATURE

Perceptual Defense

The concept of perceptual defense was employed first in a study by Postman, Bruner, and McGinnies (32). Thirty-six words representing the six value areas of the Allport-Vernon Study of Values (1) were presented tachistoscopically to 25 subjects by the ascending method, i.e., from very brief to longer exposures until recognition occurred. The Allport-Vernon Study of Values was administered also. The results indicated an inverse relation between recognition threshold and value rank of words, i.e., recognition thresholds for high-value words were lower than recognition thresholds for low-value words. An individual's values were considered to sensitize the individual to stimuli congruent with his values. This process of lowered thresholds to acceptable or valued stimuli was called perceptual sensitization. On the other hand, an individual's values were considered to anesthetize the individual to stimuli incongruent with his values. This process of raised thresholds to unacceptable or threatening stimuli was called perceptual defense.

In an attempt to explain the results of the Postman, Bruner, and McGinnies study without employing the concepts

of defense and sensitization, Solomon and Howes (35) made use of an empirical finding and an assumption. They referred to data (14) which revealed an inverse relation between recognition threshold and frequency of general usage of words given by the Thorndike-Lorge lists (36), i.e., recognition thresholds for frequently used words are lower than recognition thresholds for less frequently used words. And they assumed that persons who highly value a given area use words related to that area more often than persons who do not value the area. Therefore, the inverse relation between recognition threshold and value rank would be expected.

The Postman, Bruner, and McGinnies study was substantially repeated by Solomon and Howes (35) in an effort to determine the degree to which the relation between value and threshold could be reduced to a relation between frequency of word usage and threshold. Differences in frequency of general usage of words were controlled by means of the Thorndike-Lorge lists. The mean frequency of general usage of words in the different value areas was equated. Within each value area, however, a set of relatively uncommon words and a set of relatively common ones were selected. The results were the following: (1) there was scant relation between value and threshold for the common words, though there was a small trend in the anticipated direction; (2) there was greater relation between value and threshold

for the uncommon words, and the thresholds for the uncommon words in the highest and lowest value areas were significantly different; (3) there were significantly higher thresholds for the uncommon words than for the common words. The relatively small difference between thresholds for high and low value words which remained after frequency of general usage was controlled was attributed to individual differences in frequency of word usage.

The Solomon and Howes experiment was essentially repeated by Postman and Schneider (33), and similar results were obtained, although a greater difference between the thresholds for the frequent and infrequent words and a clearer relation between values and thresholds for the infrequent words were found. The suggestion by Solomon and Howes that the effect of value on threshold could be reduced to the effect of individual differences in frequency of word usage was rejected by Postman and Schneider. The retardation of recognition when infrequent words are used was considered an occasion when motivational components such as values could affect responses.

Experimental results interpreted as supporting the hypothesis of perceptual defense have been reported by a number of other investigators who have attempted to control for variables such as familiarity and set (4, 5, 7, 10). For example, in a study by Cowen and Beier (7), subjects

were given a series of booklets, half of which contained a neutral, five-letter word and half of which contained a taboo, five-letter word. Each booklet had 30 carbon copies of a five-letter word which had been typed in capital letters on an electric typewriter. The copies were arranged in order from the most to the least blurred. A subject was required to thumb through a booklet until he could report the word correctly. Significantly more attempts were necessary for recognition of the taboo words than for recognition of the neutral ones. It was assumed that if word frequency had a critical effect on response, a correlation between word frequency and mean number of attempts necessary for recognition of a word would be significantly negative. The correlation, however, was not significant. A number of statistical and logical measures were employed to lessen the plausibility of interpreting the results in terms of conscious withholding of responses to threatening words. Prerecognition responses were analyzed also. The results were interpreted as supporting the perceptual defense hypothesis.

On the other hand, experimental results interpreted as not supporting the hypothesis of perceptual defense have been reported by other investigators who have attempted to control for variables such as familiarity and set (11, 31). For example, in an experiment reported by Postman, Bronson, and Gropper (31), taboo and neutral words were equated as

much as possible by use of the Thorndike-Lorge lists. The words were presented tachistoscopically to four groups of subjects who received different instructions. For all four groups the thresholds to the neutral words were somewhat higher than the thresholds to the taboo words. The investigators suggested that the higher thresholds to the neutral words were probably the result of underestimation of frequency of taboo word usage. The relative thresholds to the taboo and neutral words, however, were significantly affected by the type of instructions. For instance, the thresholds of a group who had not been instructed to anticipate taboo words were relatively higher to the taboo words than were the thresholds of the other three groups who had been instructed to anticipate taboo words. The findings were interpreted as providing no evidence of perceptual defense.

To advocate perceptual defense as a process by which an individual's threshold to threatening stimuli is raised is to be faced with the difficult implication of discrimination prior to conscious recognition. An attempt to demonstrate such discrimination was reported by McGinnies (25). Neutral and taboo words were presented tachistoscopically, and thresholds of recognition and GSRs prior to recognition were determined. In addition, the responses prior to recognition were analyzed in terms of four categories: (1) responses which were incomplete, i.e., not enough letters to

form complete words, (2) responses which were comparable to the stimulus word in structure, (3) responses which were structurally disparate, and (4) responses without dictionary meanings. From an analysis of the results it was revealed that the GSRs prior to recognition were significantly greater to the taboo words than to the neutral words, and recognition thresholds were significantly higher to the taboo words. Relatively more meaningless and structurally disparate responses were given to the taboo words than to the neutral words, and relatively more incomplete and structurally comparable responses were given to the neutral words. The results were interpreted as evidence of discrimination prior to conscious recognition. The raising of thresholds to taboo words and the distortion of taboo words were considered efforts to postpone the anxiety attendant upon conscious recognition.

McGinnies's interpretation was rejected by Howes and Solomon (13). The differences in thresholds were ascribed largely to differences in word frequencies, and a study of Howes and Solomon (14) was cited as evidence. Also, it was argued that subjects probably procrastinated in reporting the taboo words after they recognized them, and, consequently, the GSRs to the taboo words, which supposedly occurred prior to recognition, were actually GSRs to recognized words.

Howes and Solomon's (13) interpretation of the differences in threshold as a function of word frequency was answered by McGinnies (26). It was argued that though the taboo words are not commonly found in the literature, they are, nevertheless, familiar words. Among the evidence cited in an attempt to refute Howes and Solomon's assumptions concerning procrastination in reporting taboo words were the following: (1) the analysis of responses prior to recognition (25), (2) an interim report of a study by McCleary and Lazarus (24),[1] and (3) the results of a study by McGinnies and Sherman (27).

In the McGinnies and Sherman study, neutral, five-letter words of approximately the same Thorndike-Lorge frequency and taboo, five-letter words were presented tachistoscopically to subjects. Recognition thresholds were established for a group of eight neutral words. Half of the group of neutral words were preceded by exposure of a taboo word for approximately two seconds; the other half of the group of neutral words were preceded by exposure of a neutral word for approximately two seconds. Thresholds for the neutral words which were preceded by taboo words were significantly higher than thresholds for the neutral

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[1] This study was reported more completely by Lazarus and McCleary (21); the study by Lazarus and McCleary is briefly reviewed on the following page.

words which were preceded by neutral words. The findings were considered evidence of the generalization of perceptual defense to neutral words.

A study by Lazarus and McCleary (21) was somewhat similar to the study by McGinnies (25), but in the Lazarus and McCleary study, differences in commonness of the stimuli and the possibility of procrastination by the subject in reporting emotionally-toned stimuli were eliminated. Subjects were presented tachistoscopically five nonsense syllables to which GSRs had been conditioned earlier and five nonsense syllables to which GSRs had not been conditioned. For exposures too brief for recognition, the GSRs were significantly greater to the conditioned syllables than to the nonconditioned syllables. The thresholds were not higher to the conditioned than to the nonconditioned syllables, however. It was concluded that the GSR data indicated discrimination by the autonomic nervous system prior to conscious awareness. This process was termed subception.

An alternative explanation of the Lazarus and McCleary data was offered by Eriksen (9). Eriksen's formulation of the subception process was in terms of a partial correlation between GSRs and nonsense syllables with verbal responses partialled out. The existence of no incompatibility between the interpretation of subception as a partial correlation and the assumption of discrimination without awareness

was admitted. It was argued, however, that discrimination without awareness was not demonstrated since the 10 syllables allowed as responses were not enough to reflect the subject's capacity for verbal discrimination. Restriction of verbal responses and freedom of GSRs were considered conditions tending to increase the partial correlation between GSRs and nonsense syllables. Subception was considered an artifact of the experimental conditions.

Similarity between the experimental conditions of the Lazarus and McCleary study and conditions outside the laboratory was suggested by Lazarus (20) in answer to Eriksen. It was argued that in real life, verbal responses are more restricted in relation to stimulation than are physiological responses.

Considerable controversy concerning perceptual defense was revealed in the literature cited. In perceptual defense studies, care must be taken to control "nonemotional" variables such as set and familiarity. Such control is apparently difficult (30).

Galvanic Skin Response

More than 25 years ago, Landis and Dewick (18) and Landis (17) brought out comprehensive reviews of the literature on the GSR. Between these two articles, 548 different papers were cited. A more recent but more specific review

of the literature on the GSR was one by McCleary (23). McCleary mainly reviewed the literature concerning the physiological basis of the GSR.

In recent times, the GSR has been used frequently in psychological experiments. The following, no doubt, are among the reasons for its popularity: it may be read from an electrical instrument; it may be elicited by stimuli that fail to produce many other types of response; it may reveal differential reactions to stimuli to which conscious recognition in not evinced (24, 25); voluntary inhibition of the response is precluded (23). However, several questions are suggested by the widespread use of the GSR in psychological studies.

One question is concerned with the physiological basis of the response. Apparently the GSR is a result of some activity of the sweat glands prior to secretion (23). This activity is dependent presumably on the action of the sympathetic nervous system (23).

A second question is concerned with the psychological meaning of the GSR. The GSR is produced by many kinds of stimuli but particularly by emotion-provoking stimuli (19). For example, in a study reported by Landis and Hunt (19), a wide variety of subjects were presented many kinds of stimuli to which GSRs were determined. The subjects were requested to introspect on their reactions to the stimuli.

Galvanic skin responses were revealed to all the kinds of stimuli employed and to all the kinds of introspection verbalized. However, emotion-provoking stimuli, whether categorized as such a priori or from the introspections of the subjects, were consistently among the most effective stimuli in producing GSRs in terms of both amplitude and frequency.

Evidence that significant decreases in skin resistance occur to stimuli of an emotional or stressful nature is provided by other studies also. For example, in a study reported by Baker and Taylor (2), presumed emotion-inciting stimulation was produced by electrical sparks from an induction coil near subjects. Significant decreases in skin resistance were revealed during periods of stimulation as compared with periods of rest.

In a study reported by Kushner (15), three experimental groups of subjects were exposed to three types of stressful situations. One group of subjects were required to read material while their verbalizations were played back to them through earphones after a .3 second delay. A second group were given a difficult exercise in mirror drawing, were told it was a test of performance intelligence, and after completing it, were told they were inferior. A third group were given electric shocks at various intervals. For the three experimental groups, there were

significant decreases in resistance from base readings to readings after the stress situations, as compared with readings for a control group.

The studies by Lazarus and McCleary (21) and McGinnies (25) are two other studies that may be interpreted as providing evidence that significant decreases in skin resistance occur to stimuli of an emotional or stressful nature.

It was suggested by Schlosberg (34) that the intensity dimension of emotion be conceived in terms of Lindsley's (22) activation theory, emotional activation considered as varying along a continuum from sleep through attentive states to strong emotion. The GSR was considered an appropriate indicator of activation level by Schlosberg.

A third question is concerned with the appropriate units of measurement of the GSR. Two studies bearing upon this question were in substantial agreement that logarithmic change in conductance is an acceptable unit (12, 16).

In one of these studies (12), four measures of GSR, i.e., change in resistance, change in conductance, change in logarithmic resistance, and logarithmic change in conductance, were examined according to the assumptions basic to the justifiable use of analysis of variance, e.g., homogeneity of variances and normality of distributions. The GSRs to words which had been rated by subjects as pleasant,

indifferent, and unpleasant were examined. The assumptions for analysis of variance were best satisfied by logarithmic change in conductance.

In the other study (16), eight measures of GSR, e.g., change in resistance, change in conductance, change in logarithmic resistance, and logarithmic change in conductance, were examined according to two standards, i.e., normality of distributions and independence of GSRs from base levels. For each subject, base level readings and a reading after an electric shock was delivered were recorded. The two standards were satisfied only by logarithmic change in conductance and change in conductance. Change in conductance was considered the more appropriate unit because it is easier to compute.

The following summary statements concerning the GSR may be made. The GSR is dependent on sweat-gland activity and the sympathetic nervous system. The GSR is elicited by many kinds of stimuli but especially emotionally-toned stimuli. Intensity of emotion may be conceived as changing along an activation continuum, and the GSR may be used as an indicator of activation level. Finally, logarithmic change in conductance is an appropriate unit of measurement of the GSR.

CHAPTER III

PROBLEM

It was the purpose of this study, in conjunction with a study by Duncan (8), to determine whether or not perception of the simulant-amputee physique of the male is threatening to the nondisabled male.

A review of the literature suggested three hypotheses which seemed reasonable. Confirmation of the hypotheses would provide strong evidence that perception of the simulant-amputee physique of the male, hereafter called amputee, is threatening to the nondisabled male. The hypotheses were the following:

> I. Recognition thresholds are higher for tachistoscopically-presented slides of amputees in usual clothing than for tachistoscopically-presented slides of nondisabled males in novel clothing.
>
> II. Tachistoscopically-presented slides of amputees in usual clothing are seen as pictures of nondisabled persons in novel clothing more often than tachistoscopically-presented slides of nondisabled males in novel clothing are seen as pictures of amputees in usual clothing.
>
> III. At three levels of perception, i.e., immediately below the recognition threshold, approximately at the recognition threshold, and far above the recognition threshold, there is greater arousal on the emotional activity continuum, as measured by the GSR, to tachistoscopically-presented slides of amputees in usual clothing than to tachistoscopically-presented slides of nondisabled males in novel clothing.

A limitation placed on each hypothesis was that slides of the nondisabled male in novel clothing be at least as

novel as slides of the amputee in usual clothing. In the light of this requirement, if the hypotheses were confirmed, confirmation could not then be attributed to the greater novelty of amputee slides. On the other hand, confirmation of the hypotheses could be reasonably interpreted in terms of an emotional-motivational factor, i.e., threat.

This study was mainly concerned with hypotheses I and II. The study by Duncan (8) was mainly concerned with hypothesis III.

CHAPTER IV

METHOD

Two types of lantern slides were used in the experiment, i.e., amputee slides and nondisabled slides.[1] The slides were projected on a screen by means of a projector with a tachistoscopic attachment.

Each of 32 nondisabled male subjects was shown four different amputee slides and four different nondisabled slides, and it was the subject's task to recognize the pictures. The series of eight slides was presented first at the fastest shutter setting and the concomitant minimum light intensity settings of the tachistoscope. These concomitant settings were such that recognition of any slide on the first run by any subject was precluded. The succeeding runs of pictures were presented to the subject at progressively slower shutter speeds and concomitantly at progressively greater light intensities. The slides composing a run were the ones that had not been recognized in the preceding runs. After all eight slides were recognized, they were all flashed once again, each for the relatively long time of two seconds at the greatest light intensity.

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[1] Slides of the simulant-amputee male in usual clothing and slides of the nondisabled male in novel clothing.

The subjects' GSRs to the pictures were recorded for each presentation. The GSR was used as a measure of emotional arousal.

The tachistoscopic settings, the GSRs, and the subjects' verbal efforts to identify the pictures, provided the necessary information for the investigation of the three hypotheses.

Setting and Examiners

Prior to the experiment, part of the apparatus used to record GSRs had been mounted permanently in the wall of a very small room. The room, approximately 8 feet by 10 feet, was considered too small for use as a projection and testing room.

A room of more suitable dimensions was chosen as the projection and testing room. The room was approximately 14 feet by 18 feet and was approximately 13 feet from the small room. The subject was seated about seven feet from a projector screen. Practically the only light in the room during the experiment was a small amount of diffuse light from the slide projector and from a small night light.

Two examiners participated in the experiment. One examiner, examiner A, tachistoscopically projected the pictures for the subject in the large room while the other examiner, examiner B, operated the GSR equipment in the small room.

Equipment

Lantern slides. The kinds of three and one-fourth by four inch lantern slides made from photographs of eight models are shown in Table 1. It will be seen that from each model two types of slides were made, one of which depicted a certain kind of amputee and the other of which depicted a nondisabled person in a certain kind of novel clothing.

In the experiment, differences between models were counterbalanced for the two types of slides in the following manner. Experimental subjects 1 through 16 were shown the amputee slides of models 1 through 4 and the nondisabled slides of models 5 through 8. Subjects 17 through 32 were shown the nondisabled slides of models 1 through 4 and the amputee slides of models 5 through 8.

An attempt was made in the experiment to eliminate differences which might have been attributable to a single order of presentation of the two types of slides. The orders of presentation for the 32 subjects are shown in Table 2. It will be seen that the eight slides shown subjects 1 through 16 were presented in a different order for each subject, and the other eight slides shown subjects 17 through 32 were presented in a different order for each of these subjects. Subjects in any given row were presented the slides in that row in the order reading from left to right. The symbols are interpreted as follows: LL, part of the left

Table 1

Kinds of Slides Made From Photographs of Eight Models

Models	Amputee Slides	Nondisabled Slides
1	Right arm missing	Right sleeve missing
2	Left arm missing	Left sleeve missing
3	Right leg missing	Right pants leg missing
4	Left leg missing	Left pants leg missing
5	Right arm missing	Right sleeve missing
6	Left arm missing	Left sleeve missing
7	Right leg missing	Right pants leg missing
8	Left leg missing	Left pants leg missing

Table 2

Orders of Presentation of the Slides

Subjects	Orders of Presentation							
1, 17	LL	RS	RP	LA	RA	LP	LS	RL
2, 18	RS	RP	LA	RA	LP	LS	RL	LL
3, 19	RP	LA	RA	LP	LS	RL	LL	RS
4, 20	LA	RA	LP	LS	RL	LL	RS	RP
5, 21	RA	LP	LS	RL	LL	RS	RP	LA
6, 22	LP	LS	RL	LL	RS	RP	LA	RA
7, 23	LS	RL	LL	RS	RP	LA	RA	LP
8, 24	RL	LL	RS	RP	LA	RA	LP	LS
9, 25	RS	LA	LL	RP	LP	RL	RA	LS
10, 26	LA	LL	RP	LP	RL	RA	LS	RS
11, 27	LL	RP	LP	RL	RA	LS	RS	LA
12, 28	RP	LP	RL	RA	LS	RS	LA	LL
13, 29	LP	RL	RA	LS	RS	LA	LL	RP
14, 30	RL	RA	LS	RS	LA	LL	RP	LP
15, 31	RA	LS	RS	LA	LL	RP	LP	RL
16, 32	LS	RS	LA	LL	RP	LP	RL	RA

leg was missing; RS, part of the right sleeve was missing; RP, part of the right pants leg was missing; LA, part of the left arm was missing; RA, part of the right arm was missing; LP, part of the left pants leg was missing; LS, part of the left sleeve was missing; RL, part of the right leg was missing.

A description of the preparation of the slides is given in Appendix A.

Lantern slide projector. The lantern slides were projected on the screen by means of a Keystone Overhead Projector for three and one-fourth by four inch lantern slides.

Tachistoscope. A Keystone Flashmeter was mounted over the lens of the lantern slide projector. The shutter speed of the Flashmeter could be varied according to seven settings of the instrument which were 1/100 second, 1/50 second, 1/25 second, 1/10 second, 1/5 second, 1/2 second, and 1 second, or the shutter could be manually opened and held open for any desired length of time.

The amount of light projected could be varied by changing a continuously variable iris in the Flashmeter. However, in order to satisfy the requirements of this experiment, it was necessary to be able to reduce the amount of projected light more than was possible solely by means of the variable iris. In order to accomplish this, the

investigator made two polaroid disks from a sheet of polaroid film and mounted them on the Flashmeter in such a manner that the amount of light projected could be varied by rotating one of the disks. An arbitrary scale was devised for the polaroid disk apparatus.

Though there was a control on the Flashmeter by which the size of the opening of the iris could be continuously varied, there was no scale accompanying this control. Without a scale it would have been difficult to duplicate a given position of the control. Therefore an arbitrary scale was devised for the iris control and was attached to the Flashmeter.

By using the upper scale of a Weston Master II exposure meter, settings of the polaroid disks in relation to the variable iris were determined, such that approximately twice as many foot-candles of light would be projected for any given combination setting than in the immediately preceding combination setting.

Table 3 shows the concomitant shutter speed and light intensity settings used in the experiment. For any given row in the table the shutter speed and light intensity were concomitant settings. The "k" in the table is used as a mathematical constant. It symbolizes a certain light intensity value measured by the Weston Master II exposure meter.

Table 3

Tachistoscope Settings

Shutter Speeds	Light Intensities
1/100 second	1k
1/50 second	2k
1/25 second	4k
1/10 second	8k
1/5 second	16k
1/2 second	32k
1 second	64k
2 seconds	greater than 128k

As there was no device on the Flashmeter to time the opening of the shutter for a two second interval, and as the timing device for the one second interval was not working, the shutter was manually opened and timed with a stop watch for these intervals. It was necessary to use the one second interval for only four subjects. The other subjects had recognized all eight slides before this setting was reached.

Thus it was possible to vary the shutter settings and concomitantly to vary the light intensity settings. The shutter speed of a given setting was approximately one-half as fast as that of the immediately preceding shutter setting, and the accompanying amount of light projected was approximately twice that projected at the preceding light intensity settings.

In this paper the word tachistoscope refers to the composite apparatus of Flashmeter and variable polaroid disks.

Project-O-Chart. An American Optical Company Project-O-Chart, model number 1215, was used to project continuously on the screen approximately a quarter circle of light, whose chord on the screen was about three-fourths inch. The quarter circle of projected light provided the subject a constant focal point for all the pictures.

Projector screen. The stimulus slides and the quarter circle of light were projected on a Radiant screen, approximately four feet by six feet, made of Radiant Vynaflect fabric.

Night light. A Leviton Nite Lite, made by the Leviton Manufacturing Company of Brooklyn, New York, was burned continuously in the projection and testing room during the presentation of the slides. It was used to reduce or eliminate any auto-kinetic effect that might have occurred from a subject's focusing on the small quarter circle of light projected on the screen. The Nite Lite consisted of a seven watt, white-colored bulb, a bakelite holder with an electric switch, and a cream-colored, bakelite, adjustable shade.

GSR apparatus. The GSR equipment consisted of two round electrodes, two cables from the electrodes to a differential ohmograph, and an Esterline-Angus Graphic Ammeter which was wired to the ohmograph.

The zinc-vanadium electrodes were approximately 1.9 centimeters in diameter. They were partially embedded in a piece of plastic which held them approximately 1.6 centimeters apart. The electrodes were fastened to the palm of a subject's right hand by means of a rubber strap which was attached to the plastic.

Since the subject was in a separate room from the recording equipment, the shielded copper cables from the electrodes to the differential ohmograph were rather long, i.e., each cable was approximately 40 feet long. It was assumed that the GSR was not affected by the length of the

cables since logarithmic change in conductance, the unit chosen for the GSR, is apparently independent from base levels (16).

The differential ohmograph had two constant current sources, one of which was connected to a resistance decade, called the reference resistance, that was adjustable from 0 to 100 kilo-ohms. The other constant current source was connected to the electrodes attached to the palm of the subject's right hand. The voltage drop across the reference resistance was amplified by a DC amplifier; the voltage drop across the electrodes was amplified by a second DC amplifier. The difference between the output of the two DC amplifiers was fed to an amplifier which drove the 0 to 1 milliammeter Esterline-Angus Graphic Ammeter.

A gross reading of the skin resistance of a subject at any given time was given by a Weston Model 301 galvanometer which was mounted on the ohmograph. The galvanometer was scaled in units of 10 kilo-ohms from 0 to 100 kilo-ohms. A more precise reading could be obtained from the paper record of the Graphic Ammeter.

A decision was made to flash a picture at an instant when uncontrolled factors were causing little fluctuation in a subject's resistance. The appropriate instant could be determined by watching closely the pen of the Esterline-Angus Graphic Ammeter. It was therefore decided that the

examiner operating the GSR apparatus, examiner B, determine the instant a picture should be flashed.

Signal system. Since examiner B determined when a picture should be flashed, a system of communication between examiner B and examiner A was necessary. A signal system using small neon bulbs was constructed for the communication. It was devised mainly by Duncan and was described by him (8).

Subjects

The 32 volunteer subjects were men of relatively normal physique: the only requirement in terms of physique was that they have no apparent severe disability. Several wore glasses, and one had an amputation of a part of one or two of his fingers.

All had completed at least a high-school education or its equivalent, and all but one were students of the University of Houston. The exception was a junior high school teacher whose wife was employed by the University of Houston.

There was no standard procedure of obtaining subjects. Some were students enrolled in psychology courses who were asked in class to volunteer for the experiment. Many others, however, were persons seen on the campus out of class who were asked to volunteer.

No subject, to the best of the investigator's knowledge, knew the purpose of the experiment.

Procedure

A subject was seated in a classroom chair approximately seven feet from the projector screen. A small amount of electrode paste was rubbed over two small areas of the palm of the subject's right hand, and the electrodes were strapped to the palm in such a manner that they were in contact with the areas prepared with paste. The subject rested his right arm and hand on the large, flat arm of the chair. The room was darkened with the exception of diffuse light from the slide projector, the night light, and the small quarter circle of light projected on the screen by means of the Project-O-Chart.

The subject was instructed somewhat as follows:

> A group of pictures will be flashed on the screen. In any given picture there is one thing, and only one thing, missing. The one thing missing in any given picture is not necessarily the same one thing missing in any other picture, however. After a picture is flashed, I would like you to tell me what one thing was missing.
>
> Before I flash a picture, I will say "ready." When I say "ready," I would like you to look at the spot[2] of light on the screen, and a short time after I say "ready," a picture will be flashed. For the interval beginning with "ready" and ending with the flashing of the picture, I would like you to try not to blink and to keep your eyes on the spot of light so that you do not miss the picture when it is flashed.

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[2] The small quarter circle of light projected on the screen by means of the Project-O-Chart.

After the picture is flashed, please sit quietly until I say "all right." When I say "all right," then you may tell me what you think was missing in the picture.

The pictures will be flashed so rapidly at first and with so little light that it will probably be impossible to see them clearly enough to tell what is missing. However, as soon as you have any clue as to what is missing in a picture, tell me what you think is possibly missing in the picture when I say "all right."

It is not necessary for you to look at the spot of light except for the interval beginning with "ready" and ending with the flashing of the picture. I would like you to sit as quietly as possible, however, beginning with "ready" and ending with "all right." If you are uncomfortable, you may move as soon as I say "all right," but after I say "ready," prior to flashing the next picture, try to sit quietly again.

When examiner A said "ready," he signalled examiner B. This was B's cue to check the subject's resistance recorded by the Graphic Ammeter. When the resistance was fairly stable, i.e., when there was practically no movement of the Graphic Ammeter pen, B signalled A, and A projected a slide at once.

Examiner A waited approximately 14 seconds after flashing a slide before he said "all right." This interval was allowed between the flashing of a picture and the cue for the subject to verbalize concerning the picture in order that the subject's verbalization not contaminate his GSR to the picture.

The series of eight slides was presented first at the fastest shutter setting (1/100 second) and the concomitant minimum light intensity setting. The succeeding runs

of pictures were presented at progressively greater light intensities. The slides composing each run were the ones not recognized by the subject in the preceding runs.

A slide was considered recognized when the subject was able to indicate the limb which was missing or bare. For example, if the slide was of a man with his left leg missing just below the knee, a response of simply "left leg missing," with "left" referring to the model's left,[3] was considered correct. The subject did not have to go into detail. If the subject did go into detail and was grossly in error, the response was considered incorrect. For example, one subject's response to the above kind of slide was "left leg missing, off at the hip." The response was considered incorrect because of the gross error in detail, i.e., "off at the hip."

The subjects had been instructed that one and only one thing was missing in each picture. When an occasional subject gave a response indicating that more than one thing was missing, the examiner again stressed that only one thing was to be considered missing in each picture. If one of the subject's responses was correct, and he then chose this

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[3] It was determined whether a subject used "left" and "right" with reference to left screen and right screen or with reference to the model's left and right. The subject was allowed either method of indicating left and right.

correct response as his answer, the slide was considered recognized. If the subject persisted in giving as his answer more than one response, one or more of which were incorrect, the slide was not considered recognized.[4]

No subject was able to recognize any slide during the first presentation of the series. Though some subjects began to recognize slides during the second presentation of the series, the majority of subjects were not able to recognize any slide during the second presentation. By the end of the third run of slides, however, only three subjects had failed to recognize at least one slide.

After a subject had recognized all eight slides, they were all flashed once again, each for two seconds at the highest light intensity. The series of slides was projected above threshold during the final presentation, i.e., every subject recognized every slide.

Techniques of Measurement

Method of determining relative thresholds to the two types of slides. Each subject's relative thresholds to the amputee slides and to the nondisabled slides were determined.

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[4] Had the slides been considered recognized when the subject persisted in giving a correct response along with one or more incorrect responses, the observed results (f_o) of Table 5, page 42, would have been 28 and 1 rather than 25 and 2.

The thresholds were dependent on the settings of the tachistoscope at which each slide was first recognized.

The concomitant settings of the tachistoscope at which a subject made his first recognition of one of the slides were noted. Any picture recognized during these concomitant settings was given a value of 1. Any picture recognized during the next settings of the tachistoscope was given a value of 2, and so on.

The values for the amputee slides were summed, and the values for the nondisabled slides were summed. If the sum of the values for the amputee slides was greater than the sum of the values for the nondisabled slides, the subject's threshold for the amputee slides was considered higher than his threshold for the nondisabled slides. If the sum of the values for the nondisabled slides was greater than the sum of the values for the amputee slides, the subject's threshold for the nondisabled slides was considered higher than his threshold for the amputee slides. If the two sums were equal, the thresholds were considered equal.

Table 4 shows the method of determining the two sums. It will be seen in the hypothetical example that the first recognition of one of the slides was made during the concomitant settings of 1/50, 2k. The two amputee slides recognized during these settings were each assigned the value of 1. The one nondisabled slide recognized during these

Table 4

A Hypothetical Example of the Method of Assigning Values to the First Recognition of Slides

Tachistoscope Settings	Amputee Slides and Values Assigned	Nondisabled Slides and Values Assigned
1/50, 2k	RL 1 LL 1	RS 1
1/25, 4k		
1/10, 8k	RA 3 LA 3	LS 3
1/5, 16k		RP 4 LP 4
Sums of Values	8	12

settings was also assigned the value of 1. No picture was recognized during the next concomitant settings of 1/25, 4k. The two amputee slides recognized during the settings of 1/10, 8k, were each assigned a value of 3, and the nondisabled slide recognized during these settings was also assigned a value of 3. A value of 3 was given to each of the pictures recognized during the 1/10, 8k, settings since they were the third settings within the subject's range even though no picture was recognized during the immediately preceding settings of 1/25, 4k. The last two slides recognized were nondisabled ones. They were recognized during the settings of 1/5, 16k, and each was assigned the value of 4. The sum of the nondisabled values of 12 was greater than the sum of the amputee values of 8. A subject with greater nondisabled values than amputee values, as in this hypothetical example, was considered to have a higher threshold for the nondisabled slides than for the amputee slides.

The values assigned to the first recognition of each slide by each subject are given in Appendix B. The symbols are to be interpreted as they were in Table 2, page 23. The symbols were defined on pages 21 and 24.

Method of determining pre-recognition tendencies of perception. A value of 1 was recorded each time a nondisabled slide was presented to a subject who made no reference

to missing clothing but called the slide a picture of an amputee. These values for any given subject were summed.

A value of 1 was also recorded each time an amputee slide was presented to a subject who made no reference to amputation but called the slide a picture of a person with part of his clothing missing. These values for any given subject were summed.

If the former sum was greater, the subject was considered to have a pre-recognition tendency to see the nondisabled in novel clothing as an amputee. If the latter sum was greater, the subject was considered to have a pre-recognition tendency to see the amputee as the nondisabled in novel clothing. If the sums were equal, the subject was considered to have neither tendency.

The sums of pre-recognition values for each subject are given in Appendix C.

Method of computing individual GSRs and GSR scores. Logarithmic change in conductance was used as the measure of GSR to the presentation of a slide and was computed from readings of the Graphic Ammeter record. An interval representing 12 seconds was measured on the record from the time at which a slide was flashed. The 12 second interval represented the first 12 seconds of the time that expired between the presentation of a slide and the verbal response of the subject. Within the 12 second interval, the value

of the resistance at the point that it began to decrease was read from the record and was converted to conductance. The value of the minimum resistance within the 12 second interval was read also from the record and was converted to conductance. The logarithm of the difference between the two conductance values was computed as the GSR to the presentation of the slide. However, if there was no decrease in resistance within the 12 second interval after the picture was flashed, the value of the GSR was considered zero.

For each subject six scores were computed from 24 GSRs. The six scores consisted of a nondisabled score and an amputee score for each of three levels of perception, i.e., immediately below the recognition threshold, approximately at the recognition threshold, and far above the recognition threshold. The six scores were computed from GSRs in the following manner.

A subject's GSR to each of the four nondisabled slides for the presentation immediately preceding the presentation at which recognition of the picture first occurred was computed. The four such GSRs were summed to give the nondisabled score for the level of perception immediately below the recognition threshold.

A subject's GSR to each of the four amputee slides for the presentation immediately preceding the presentation at which recognition of the picture first occurred

was computed. The four such GSRs were summed to give the amputee score for the level of perception immediately below the recognition threshold.

A subject's GSR to each of the four nondisabled slides for the presentation at which recognition of the picture first occurred was computed. The four such GSRs were summed to give the nondisabled score for the level of perception approximately at the recognition threshold.

A subject's GSR to each of the four amputee slides for the presentation at which recognition of the picture first occurred was computed. The four such GSRs were summed to give the amputee score for the level of perception approximately at the recognition threshold.

A subject's GSR to each of the four nondisabled slides for the final presentation of two seconds at maximum light intensity was computed. The four such GSRs were summed to give the nondisabled score for the level of perception far above the recognition threshold.

A subject's GSR to each of the four amputee slides for the final presentation of two seconds at maximum light intensity was computed. The four such GSRs were summed to give the amputee score for the level of perception far above the recognition threshold.

CHAPTER V

RESULTS

Analysis of the Data Concerning the First Hypothesis

The data did not support the first hypothesis that recognition thresholds are higher for tachistoscopically-presented slides of amputees in usual clothing than for tachistoscopically-presented slides of nondisabled males in novel clothing. The data were in the negative direction. There were 25 subjects with higher thresholds for the nondisabled slides than for the amputee slides, 5 subjects with equal thresholds, and only 2 subjects with higher thresholds for the amputee slides than for the nondisabled slides.

Table 5 shows a chi-square test made to determine whether or not there was a significant difference in the negative direction. The observed results (f_o) were tested against an expected frequency (f_e) of one-half of the subjects in each of the two threshold categories. For one degree of freedom the χ^2 of 19.59 was significant beyond the .001 level.

Thus the data not only failed to support the first hypothesis, but a significant difference was revealed in the direction opposite to that hypothesized. The recognition thresholds were significantly higher for the nondisabled slides than for the amputee slides.

Table 5

Chi-Square Test Based on Relative Thresholds

	Higher Thresholds for Nondisabled Slides than for Amputee Slides	Higher Thresholds for Amputee Slides than for Nondisabled Slides
f_o	25	2
f_e	13.5	13.5

$$\chi^2 = 19.59$$

Analysis of the Data Concerning the Second Hypothesis

The data did not support the second hypothesis which was the following: tachistoscopically-presented slides of amputees in usual clothing are seen as pictures of nondisabled persons in novel clothing more often than tachistoscopically-presented slides of nondisabled males in novel clothing are seen as pictures of amputees in usual clothing. The data were in the negative direction. There were 28 subjects with a pre-recognition tendency to see the nondisabled picture as that of an amputee, 1 subject with a pre-recognition tendency to see the amputee picture as that of the nondisabled in novel clothing, and 3 subjects with neither tendency.

Table 6 shows a chi-square test similar to that of Table 5. For one degree of freedom the χ^2 of 25.14 was significant beyond the .001 level. Thus the data not only failed to support the second hypothesis, but a significant difference was revealed in the direction opposite to that hypothesized. The nondisabled in novel clothing was seen as the amputee in usual clothing more often than the amputee in usual clothing was seen as the nondisabled in novel clothing.

Table 6

Chi-Square Test Based on Pre-Recognition Tendencies

	Tendency to See Nondisabled as Amputee	Tendency to See Amputee as Nondisabled
f_o	28	1
f_e	14.5	14.5

$$\chi^2 = 25.14$$

Analysis of the Data Concerning the Third Hypothesis

Duncan (8) reported that the data did not support the third hypothesis which was the following: at three levels of perception, i.e., immediately below the recognition threshold, approximately at the recognition threshold, and far above the recognition threshold, there is greater arousal on the emotional activity continuum, as measured by the GSR, to tachistoscopically-presented slides of amputees in usual clothing than to tachistoscopically-presented slides of nondisabled males in novel clothing.

An analysis of variance test of the data concerning the third hypothesis was made. An F ratio computed to test the difference between the nondisabled scores and the amputee scores regardless of the level of perception was not significant. The F ratio was .54.

The Duncan study, therefore, revealed no evidence of greater arousal on the emotional activity continuum to the amputee in usual clothing than to the nondisabled male in novel clothing.

Summary

None of the three hypotheses was confirmed. As measured here, there was no evidence, therefore, that perception of the amputee is threatening to the nondisabled male.

Two very unexpected findings were the significant negative results concerning the first and second hypotheses. The thresholds were higher to the nondisabled slides than to the amputee slides, and the nondisabled slides were seen as pictures of amputees more often than the amputee slides were seen as pictures of the nondisabled in novel clothing.

CHAPTER VI

DISCUSSION

Differences Between the Two Types of Slides

There were at least three possible differences between the amputee slides and the nondisabled slides which may have contributed to the results of the study. The differences were the following: differences in novelty, differences in clue aspects, differences in threat-producing character.[1]

Differences in novelty. The nondisabled slides were probably more unusual than the amputee slides. The subjects, no doubt, had seen amputees or pictures of them more often than they had seen persons with one sleeve or one pants-leg missing or pictures of persons in such clothing.

If the only difference between the slides had been a difference in novelty, the negative results pertaining to the first and second hypotheses might have been attributed to a difference in novelty. In other words, the fact that the thresholds were higher to the nondisabled slides than to the amputee slides and the fact that the nondisabled slides

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[1] Novelty, clue aspects, and threat-producing character are similar to three concepts of the Postman (29) and Bruner (6) hypothesis theory of perception, i.e., "frequency of past confirmation," "information," and "motivational" influence, respectively.

were seen as pictures of amputees more often than the amputee slides were seen as pictures of the nondisabled in novel clothing, might have been attributed to the greater novelty of the nondisabled slides.

Differences in clue aspects. There seem to have been differences in clue aspects between the leg-missing slides and the pants-leg-missing slides which tended to produce an "amputee" response before a "novel clothing" response regardless of whether a slide was a leg-missing one or a pants-leg-missing one. This, consequently, may have contributed to the recognition of the amputee slides prior to the recognition of the nondisabled slides and also to the result that the nondisabled slides were seen as pictures of amputees more often than the amputee slides were seen as pictures of the nondisabled in novel clothing.

In the pants-leg-missing slides the difference in brightness was rather great between the dark-colored trousers and the relatively light-colored leg which was partially bare, and the difference in brightness was great between the dark trousers and the white background. There was not so much difference in brightness between the bare leg and the white background, however. Therefore, regardless of whether a slide was a pants-leg-missing one or a leg-missing one, a subject possibly could make the following discrimination at rapid exposure speeds: "There is a much

longer dark space where one of the legs should be than where the other leg should be." It would be reasonable to suppose that this often led to a "leg missing" response. A slower exposure speed was required to make the additional, more difficult discrimination necessary to recognize the pants-leg-missing slides, i.e., the subject had to recognize the difference in brightness between the background and the partially bare leg.

If this difference in clue aspects existed between the leg-missing slides and the pants-leg-missing slides, it would not be surprising to find, from an analysis of the data, higher thresholds to the pants-leg-missing slides than to the leg-missing slides.

A subject's relative thresholds to the pants-leg-missing slides and the leg-missing slides were determined. The threshold values which had been assigned to the pants-leg-missing slides, by the method exemplified in Table 4, page 36, were summed. The values which had been assigned to the leg-missing slides were summed also. If the sum of the values for the pants-leg-missing slides was greater than the sum of the values for the leg-missing slides, the subject's threshold for the pants-leg-missing slides was considered higher than his threshold for the leg-missing slides. If the sum of the values for the leg-missing slides was greater than the sum of the values for the pants-leg-missing

slides, the subject's threshold for the leg-missing slides was considered higher than his threshold for the pants-leg-missing slides. If the two sums were equal, the thresholds were considered equal.

There were 28 subjects with higher thresholds to the pants-leg-missing slides than to the leg-missing slides and only 2 subjects with higher thresholds to the leg-missing slides than to the pants-leg-missing slides. Only 2 subjects had thresholds which were considered equal for the leg-missing slides and the pants-leg-missing slides.

Table 7 shows a chi-square test made to determine whether or not the thresholds for the pants-leg-missing and leg-missing slides were significantly different. The observed results were tested against an expected frequency of one-half of the subjects in each of the two threshold categories. For one degree of freedom the χ^2 of 22.53 was significant beyond the .001 level. Therefore, the thresholds for the pants-leg-missing slides were significantly higher than those for the leg-missing slides.

There was less reason to expect a difference in clue aspects between the arm-missing and sleeve-missing slides. To see the rounded "stump" in the arm-missing slides, a subject had to be able to make the same type of fine discrimination in brightness between limb and background as required to recognize the sleeve-missing slides.

Table 7

Chi-Square Test of Thresholds for Pants-Leg-Missing and Leg-Missing Slides

	Higher Thresholds for Pants-Leg-Missing Slides than for Leg-Missing Slides	Higher Thresholds for Leg-Missing Slides than for Pants-Leg-Missing Slides
f_o	28	2
f_e	15	15

$$\chi^2 = 22.53$$

Of course, it might be argued that since the arm "amputees" were in dark, short-sleeve shirts, a subject could have made the following distinction at rapid exposure speeds: "The dark spaces where the arms should be are too short to be complete arms." Such a distinction might have led to a "both arms missing" hypothesis, but such a hypothesis would have been incorrect. Since the subjects had been instructed that only one thing was missing, a subject might have altered a "both arms missing" hypothesis by making a guess as to which arm was missing. However, subjects would be expected to be correct only about 50% of the time by such guessing.

There were 18 subjects with higher thresholds for the sleeve-missing slides than for the arm-missing slides, and there were 11 subjects with higher thresholds for the arm-missing slides than for the sleeve-missing slides. Only 3 subjects had equal thresholds for the sleeve-missing and arm-missing slides.

Table 8 shows a chi-square test made to determine whether or not the thresholds for the sleeve-missing and arm-missing slides were significantly different. The observed results were tested against an equal probability hypothesis. For one degree of freedom the χ^2 of 1.69 was not significant at the .05 level. Therefore, the thresholds for the sleeve-missing and arm-missing slides were not significantly different.

Table 8

Chi-Square Test of Thresholds for Sleeve-Missing and Arm-Missing Slides

	Higher Thresholds for Sleeve-Missing Slides than for Arm-Missing Slides	Higher Thresholds for Arm-Missing Slides than for Sleeve-Missing Slides
f_o	18	11
f_e	14.5	14.5

$$\chi^2 = 1.69$$

If there had been no difference between the amputee slides and the nondisabled slides except for a difference in clue aspects between the leg-missing slides and the pants-leg-missing slides, the results of the study could be attributed to this difference in clue aspects.

Differences in threat-producing character. If there had been no differences in novelty or clue aspects between the amputee slides and the nondisabled slides, it might have been argued that the nondisabled slides were more threatening than the amputee slides because of the significantly negative results of the first and second hypotheses. However, the argument would have been tenuous since there was no significant difference in GSRs to the two types of slides.

On the other hand, if the amputee slides were more threatening than the nondisabled slides, the effect of such threat was entirely masked because of other differences between the two types of slides.

Conclusions

There was no evidence that perception of the male amputee is threatening to the nondisabled male. However, since there were three possible sources of difference between the amputee and nondisabled slides which may have contributed to the results, it is difficult to draw conclusions from the study. The investigator believes the

obtained results may be attributed to differences in clue aspects and novelty between the amputee and nondisabled slides.

Suggestions for Further Research

In future investigations greater effort must be made to equate clue aspects and novelty of amputee and nondisabled slides. Differences in clue aspects between the two types of slides could be greatly reduced by having the models for the slides in clothes of approximately the same brightness as the skin. The effects of differences in novelty might be reduced by initially projecting the slides at slow shutter speeds and high light intensities and gradually increasing the shutter speeds and reducing the light intensities.

CHAPTER VII

SUMMARY

It was the purpose of this study, in conjunction with a study by Duncan (8), to determine whether or not perception of the amputee is threatening to the nondisabled male. The following hypotheses were suggested by a review of the literature on perceptual defense and the GSR:

I. Recognition thresholds are higher for tachistoscopically-presented slides of amputees in usual clothing than for tachistoscopically-presented slides of nondisabled males in novel clothing.

II. Tachistoscopically-presented slides of amputees in usual clothing are seen as pictures of nondisabled persons in novel clothing more often than tachistoscopically-presented slides of nondisabled males in novel clothing are seen as pictures of amputees in usual clothing.

III. At three levels of perception, i.e., immediately below the recognition threshold, approximately at the recognition threshold, and far above the recognition threshold, there is greater arousal on the emotional activity continuum, as measured by the GSR, to tachistoscopically-presented slides of amputees in usual clothing than to tachistoscopically-presented slides of nondisabled males in novel clothing.

This study was mainly concerned with the first and second hypotheses. The study by Duncan (8) was mainly concerned with the third hypothesis.

Each of 32 nondisabled male subjects was presented tachistoscopically and in sequence slides of four different amputees in usual clothing and slides of four different

nondisabled males in novel clothing. Recognition thresholds of each subject for each slide were established, and pre-recognition responses of each subject were recorded. After a subject's recognition thresholds were determined, the series of eight slides was presented once again but far above threshold. A subject's GSR to each slide at each of the three levels of perception was determined.

None of the three hypotheses was confirmed by the data. On the contrary, chi-square tests of the first and second hypotheses showed significant differences in the directions opposite to the hypotheses: the thresholds were higher to the nondisabled slides than to the amputee slides, and the nondisabled slides were seen as pictures of amputees more often than the amputee slides were seen as pictures of the nondisabled in novel clothing. An analysis of variance test of the third hypothesis revealed no significant difference in emotional arousal to the two types of slides.

In this study, there was no evidence, therefore, that perception of the amputee is threatening to the nondisabled male. However, it was difficult to interpret the results because of three possible sources of difference between the amputee slides and the nondisabled slides, i.e., differences in clue aspects, differences in novelty, and differences in threat-producing character. The investigator believed the

obtained results may be attributed to differences in clue aspects and novelty between the two types of slides.

It was suggested that in future investigations greater effort must be made to equate clue aspects and novelty of amputee and nondisabled slides. Suggestions for accomplishing this were made.

REFERENCES

REFERENCES

1. Allport, G. W., & Vernon, P. E. A study of values. Boston: Houghton-Mifflin, 1931.

2. Baker, L. M., & Taylor, W. M. The relationship under stress between changes in skin temperature, electrical skin resistance and pulse rate. Journal of Experimental Psychology, 1954, 48, 361-366.

3. Barker, R. G. The social psychology of physical disability. Journal of Social Issues, 1948, 4 (4), 28-38.

4. Beier, E. G., & Cowen, E. L. A further investigation of the influence of "threat-expectancy" on perception. Journal of Personality, 1953, 22, 254-257.

5. Blum, G. S. Perceptual defense revisited. Journal of Abnormal and Social Psychology, 1955, 51, 24-29.

6. Bruner, J. S. Personality dynamics and the process of perceiving. In R. R. Blake and G. V. Ramsey (Ed.), Perception: an approach to personality. New York: Ronald, 1951. Pp. 121-147.

7. Cowen, E. L., & Beier, E. G. Threat-expectancy, word frequencies, and perceptual prerecognition hypotheses. Journal of Abnormal and Social Psychology, 1954, 49, 178-182.

8. Duncan, F. S. Perceptual and autonomic responses to amputees: a technique for measuring reactions to the disabled. Unpublished M.A. thesis, University of Houston, 1958.

9. Eriksen, C. W. Subception: fact or artifact? Psychological Review, 1956, 63, 74-80.

10. Eriksen, C. W., & Browne, T. An experimental and theoretical analysis of perceptual defense. Journal of Abnormal and Social Psychology, 1956, 52, 224-230.

11. Freeman, J. T. Set or perceptual defense? Journal of Experimental Psychology, 1954, 48, 283-288.

12. Haggard, E. A. On the application of analysis of variance to GSR data: I. The selection of an appropriate measure. Journal of Experimental Psychology, 1949, 39, 378-392.

13. Howes, D. H., & Solomon, R. L. A note on McGinnies' "Emotionality and Perceptual Defense." Psychological Review, 1950, 57, 229-234.

14. Howes, D. H., & Solomon, R. L. Visual duration threshold as a function of word probability. Journal of Experimental Psychology, 1951, 41, 401-410.

15. Kushner, M. The effects of experimentally induced stress upon critical flicker frequency, palmar skin resistance and reversible figure fluctuation. Dissertation Abstracts, 1955, 15, 2583-2584. (Abstract)

16. Lacey, O. L., & Siegal, P. S. An analysis of the unit of measurement of the galvanic skin response. Journal of Experimental Psychology, 1949, 39, 122-127.

17. Landis, C. The electrical phenomena of the skin (psychogalvanic skin response). Psychological Bulletin, 1932, 29, 693-752.

18. Landis, C., & Dewick, H. The electrical phenomena of the skin (psychogalvanic reflex). Psychological Bulletin, 1929, 26, 64-119.

19. Landis, C., & Hunt, W. A. The conscious correlates of the galvanic skin response. Journal of Experimental Psychology, 1935, 18, 505-529.

20. Lazarus, R. S. Subception: fact or artifact? A reply to Eriksen. Psychological Review, 1956, 63, 343-347.

21. Lazarus, R. S., & McCleary, R. A. Autonomic discrimination without awareness: a study of subception. Psychological Review, 1951, 58, 113-122.

22. Lindsley, D. B. Emotion. In S. S. Stevens (Ed.), Handbook of experimental psychology. New York: Wiley, 1951. Pp. 473-516.

23. McCleary, R. A. The nature of the galvanic skin response. Psychological Bulletin, 1950, 47, 97-117.

24. McCleary, R. A., & Lazarus, R. S. Autonomic discrimination without awareness: an interim report. Journal of Personality, 1949, 18, 171-179.

25. McGinnies, E. Emotionality and perceptual defense. Psychological Review, 1949, 56, 244-251.

26. McGinnies, E. Discussion of Howes' and Solomon's note on "Emotionality and Perceptual Defense." Psychological Review, 1950, 57, 235-240.

27. McGinnies, E., & Sherman, H. Generalization of perceptual defense. Journal of Abnormal and Social Psychology, 1952, 47, 81-85.

28. Meyerson, L. Special disabilities. Annual Review of Psychology, 1957, 8, 437-457.

29. Postman, L. Toward a general theory of cognition. In J. H. Rohrer and M. Sherif (Ed.), Social psychology at the crossroads. New York: Harper, 1951. Pp. 242-272.

30. Postman, L. On the problem of perceptual defense. Psychological Review, 1953, 60, 298-306.

31. Postman, L., Bronson, Wanda C., & Gropper, G. L. Is there a mechanism of perceptual defense? Journal of Abnormal and Social Psychology, 1953, 48, 215-224.

32. Postman, L., Bruner, J. S., & McGinnies, E. Personal values as selective factors in perception. Journal of Abnormal and Social Psychology, 1948, 43, 142-154.

33. Postman, L., & Schneider, B. H. Personal values, visual recognition, and recall. Psychological Review, 1951, 58, 271-284.

34. Schlosberg, H. Three dimensions of emotion. Psychological Review, 1954, 61, 81-88.

35. Solomon, R. L., & Howes, D. H. Word frequencies, personal values and visual duration thresholds. Psychological Review, 1951, 58, 256-270.

36. Thorndike, E. L., & Lorge, I. The teachers' word book of 30,000 words. New York: Teachers College, Columbia University, 1944.

37. Wittreich, W. J., & Radcliffe, K. B. The influence of simulated mutilation upon the perception of the human figure. Journal of Abnormal and Social Psychology, 1955, 51, 493-495.

APPENDIXES

APPENDIX A

PREPARATION OF LANTERN SLIDES

A portion of a 9 foot by 36 foot roll of flat-white paper was used as background for photographs from which the three and one-fourth inch by four inch lantern slides were made. The nine foot wide end of the roll was hung from a wall, and the paper was draped to the floor in such a manner that there was no definite crease in the paper at the floor line. Enough of the paper was unrolled along the floor so that in any photograph the background consisted entirely of the continuous flat-white paper. The background was well lighted by means of flood lights and ordinary electric lights in such a manner as to practically eliminate shadows cast by a model and/or by a table used in some of the photographs. The camera used to take the photographs, which were considered of satisfactory quality and sharpness by the investigator and by a professional photographer,[1] was a Brownie Hawkeye with a flash attachment.

Eight nondisabled males, who appeared to be between the ages of twenty and thirty years, served as the models for the photographs. Only men who were not students of the

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[1] John Mills of the Audio-Visual Center in the University of Houston.

University of Houston were chosen as models in order to reduce the possibility that the experimental subjects, who were men obtained at or through the University of Houston, would know the models.

A photograph of model 1 standing with his arms hanging at his side was taken. He was wearing a dark, short-sleeve shirt and dark, long trousers. The negative of this photograph was retouched so that the model's right arm was removed slightly above the elbow with a portion of the rounded "stump" showing below the sleeve of the shirt. From this retouched negative a slide was made.

Another photograph of model 1 in approximately the same standing position was taken. He was wearing the same dark, long trousers, but for this photograph he was wearing a dark, long-sleeve shirt, a portion of the right sleeve of which had been cut off. The end of the remaining portion of the right sleeve was folded under, so that the model's right arm was bare with the exception of this partial covering of his upper arm. From this photograph a slide was made.

Two photographs and slides of model 2 were made, similar to those of model 1. However, in the amputee slide of model 2, the model's left arm was removed slightly above the elbow, and in the nondisabled slide the left sleeve was missing.

The amputee slide of model 3 was made from a photograph of model 3 seated on a table and wearing dark, long trousers and a dark, long-sleeve shirt. The negative of this photograph was retouched so that the right leg was removed slightly below the knee, and a lantern slide was made from this retouched negative. The model was seated by the investigators because they assumed that it would be more "realistic" for a leg "amputee" to be sitting than to be standing without crutches by balancing on one leg. If a chair, rather than the table, had been used, retouching the negative would have been more difficult, and the retouched negative would have been less realistic.

The nondisabled slide of model 3 was made from a photograph of the model in a position similar to his position in the amputee slide. Model 3 was wearing the same dark, long-sleeve shirt, but in this photograph he was wearing dark, long trousers, a part of the right leg of which had been cut off and the end of the remaining portion folded under, so that the model's right leg was bare from just below the knee to the ankle.

Two slides of model 4 were made, similar to those of model 3. In the amputee slide of model 4, however, the left leg was removed slightly below the knee, and in the nondisabled slide the left pants leg was missing slightly below the knee.

The two photographs and slides of each of the models 5 through 8 were the same kinds as those of models 1 through 4, respectively.

The figures in all the slides were made approximately the same size and in approximately the same positions on the slides. This, of course, made the projected figures approximately the same size and in approximately the same position on the screen.

A summary of the kinds of slides made from the photographs of the eight models is shown in Table 1, page 22.

APPENDIX B

THRESHOLD VALUES OF EACH SUBJECT FOR EACH KIND OF SLIDE

Subjects	Threshold Values to Slides							
	Amputee				Nondisabled			
	RA	LA	RL	LL	RS	LS	RP	LP
1	1	3	1	2	2	1	2	2
2	2	1	1	1	3	2	2	2
3	2	3	1	3	2	1	2	1
4	2	2	1	1	4	4	4	5
5	2	1	1	1	2	2	2	2
6	2	2	1	1	2	1	3	3
7	2	1	1	1	3	3	2	2
8	2	2	1	2	3	2	3	2
9	2	1	1	1	2	1	2	2
10	1	1	1	2	2	1	2	2
11	4	2	1	2	2	3	3	3
12	2	2	1	1	1	1	2	2
13	3	2	1	1	2	2	2	2
14	1	3	1	2	1	1	2	1
15	2	4	1	2	3	4	3	3
16	4	2	1	2	4	5	4	4

Subjects	RA	LA	RL	LL	RS	LS	RP	LP
17	2	2	1	2	3	3	3	3
18	2	2	1	3	3	2	3	3
19	2	1	1	1	3	3	4	4
20	2	1	3	2	2	2	2	2
21	2	2	1	1	2	3	3	3
22	1	3	1	1	2	1	1	2
23	1	2	1	1	2	2	2	2
24	1	1	1	1	4	4	3	4
25	2	1	1	1	3	2	1	2
26	2	3	1	2	2	2	4	3
27	2	3	2	1	2	3	5	4
28	3	4	2	1	3	3	4	4
29	3	3	1	1	3	2	2	3
30	1	1	1	1	1	1	1	1
31	3	2	1	2	3	4	3	3
32	3	1	2	2	3	3	3	3

APPENDIX C

PRE-RECOGNITION SUMS FOR EACH SUBJECT

Subjects	Pre-Recognition Sums	
	Nondisabled Called Amputee	Amputee Called Nondisabled
1	3	0
2	3	0
3	0	1
4	11	0
5	2	0
6	1	0
7	5	0
8	3	0
9	1	0
10	0	0
11	5	0
12	0	0
13	2	0
14	3	2
15	2	0
16	1	0
17	5	0

Subjects	Nondisabled Called Amputee	Amputee Called Nondisabled
18	2	1
19	7	0
20	4	0
21	2	0
22	1	0
23	8	0
24	5	0
25	1	0
26	2	0
27	3	0
28	3	0
29	5	0
30	0	0
31	4	0
32	5	0