COGNITIVE ATTITUDES IN RELATION TO SUSCEPTIBILITY TO INTERFERENCE

By

Herbert J. Schlesinger

A. B., Brooklyn College, 1942

Submitted to the Department of Psychology and to the Faculty of the Graduate School of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Redacted Signature

Chairman

Redacted Signature

Redacted Signature

September, 1952

[1953]

ACKNOWLEDGMENT

I wish to thank the many persons who have helped bring this thesis into being. The thinking which led to this investigation developed during several years of association with Dr. George S. Klein. This period has been among the richest and most formative in my experience. Dr. Klein gave valuable help and encouragement freely at every phase of this research.

Dr. Martin Scheerer was one of my undergraduate professors who first influenced my decision to become a psychologist. As chairman of my thesis committee, he has been of assistance from inception to completion. Dr. Alex Sweet offered not only active encouragement, but his keen sensitivity to the data opened many new possibilities and vistas which the present thesis only begins to explore. To Dr. Alfred Baldwin go my special thanks for his understanding assistance in developing the statistical design for this as well as several previous researches. Dr. Seba Eldridge has been a source of encouragement throughout my graduate years.

Dr. Sibylle K. Escalona was of great assistance during the planning and pilot phases of the investigation as was Dr. Robert R. Holt. I am also indebted to Dr. Holt for his very helpful critical readings of the manuscript at various stages. Dr. Gardner Murphy, Dr. Riley Gardner, Dr. Philip Holzman and Mr. Gerald Ehrenreich were also of great help through their friendly criticisms and suggestions.

Thanks are due Dr. William Mikesell for his cooperation in obtaining subjects from among his students. I am very grateful to Mrs. Jane Robb for her unfailing willingness to share the many chores which this research entailed, especially for typing the several drafts and for doing much of the work of the statistical analyses. Thanks are also due Miss Lolafaye Coyne for her help in performing the statistical analyses.

The research reported upon in this dissertation is part of a group of investigations in the area of perception and personality which are supported by the National Institutes of Health, United States Public Health Service.

H. J. S.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

LIST OF FIGURES

Figure — Follows Page

CHAPTER I

INTRODUCTION

During the past few years there has been a surge of interest among psychologists in the borderland around the area of perception. The work of Murphy (50, 55, 63, 74), Bruner (10, 16, 60, 61), and Klein (43, 47) and their respective collaborators, among others, reflects a shift of attention from perception as a separate area of investigation, with laws unto itself, to perception as one way of studying the whole person. It has become almost a commonplace that various states of the organism, such as fatigue (21, 48, 66, 85), drug intoxication (81, 85), hunger (51, 67, 68), thirst (47), personal value or need involvement (1, 2, 3, 14, 19, 63, 64), and social pressures (76) can influence perception in a predictable manner. All these studies document the growing conviction that perception in general can be influenced by motivational and situational factors. It is not a long step from this conviction to the belief that personality and perception are not as discrete aspects of the person as tradition would have them, and that such studies, especially those which indicate the extent to which perception can be "influenced" by values and needs, implicate personality as the source of these influences.

Some of these investigators (46) have asked whether such generalized relationships express all that can be said about the

mutual influences of personality and perception.[1] While there can be no quarrel with efforts to seek generalized relationships and to describe the characteristics of a generalized perceptual apparatus and "personality", it seems important to clarify the conditions under which these generalisations are true and to point out the implicit limitations which they force upon our thinking about personality, as it bears upon perception.

It is the primary purpose of this thesis to show that the search for such generalized part-relationships, taken as the paradigm for the investigation of the complex inter-relationships of personality and perception, by-passes an important source of variables which condition these relationships. This source is the person himself and the way he is organized to perceive--or, more generally, his cognitive organization. A second purpose is to demonstrate the operation of one such variable which has direct significance for the study of values and needs as they affect perception.

In one of the earliest of the recent investigations in this area (14) it was found that a disc bearing a positive symbol

---

1. In what follows words denoting such different avenues of approach to the person as perception, cognition, and personality will occasionally be used as if they have the status of systems in relation to each other. This will be especially noticeable in discussions of "relationships between personality and perception". This usage is self-conscious, however, and is followed when greater precision would make it difficult to discuss earlier investigations relevant to this one, some of which have been cast, at least implicitly, in such language.

(dollar sign) was judged larger than one bearing a negative symbol (swastika) and that both were judged larger than one bearing a "neutral" design (square with diagonals). The investigators inferred from these results a perceptual principle of "accentuation" which re-states a phenomenon common in everyday experience: that things which are important to us loom larger in our sight. Another early study (11) made essentially the same point in demonstrating that in general the more valuable a coin, the more its size was over-estimated by ten-year-old children. Subsequently, other studies have shown that "accentuation" is not an inevitable consequence of the presence of a value or need during a size discrimination.

Bruner suggested at a later time (10) that the accentuation effect is markedly diminished when the subject takes a highly critical, accuracy-oriented set, and that it disappears under optimal viewing conditions. Thus, while evidence for accentuation as the inevitable consequence of the intrusion of value-stimulation upon size judgment is equivocal, there is enough evidence to suggest that the phenomenon does occur, particularly under conditions of judgment which make accurate responses difficult. But let us repeat a caution offered in a critique of the accentuation hypothesis (46): the accentuation effect is based upon the averaged responses of a group of subjects, some of whom over-estimated in their size judgments, some of whom under-estimated, and some of whom did neither consistently. While such averaging has definite uses, it

is well to keep in mind the limitations imposed upon our generalizing when we "average out" relevant variables. We can speak only of the effect of a generalized need or value upon generalized perception. We must ignore the idiosyncrasies and traits, in short, the personalities of individual perceivers as these may systematically contribute to error. Note again: this criticism does not speak against the existence of such processes as "accentuation". It is intended to remind us that the relationships from which they are inferred transcend individual perceivers and obscure a whole realm of other possible relationships. The exclusive search for generalizations about perception (of the order of "accentuation") necessarily eliminates from consideration the perceiver, who is, after all, the locus of both personality and perception.

This is not to say that individual differences have until now been entirely ignored (although this is very nearly the case). It is certainly fair to say, however, that they have received nothing like the systematic attention directed at attributes of the stimulus and at generalized motivational variables. Studies by Bruner and Goodman (11), and much earlier by Binet (7), for instance, indicate that such effects as "accentuation" or various "illusions" are most easily elicited among children. The ease with which this can be achieved decreases with age. Economic status (11) has also been shown to have an effect upon size perception, especially among children, and has recently been shown to interact with effects of age (63).

To sum up, it would seem that perception (taking size judgment as a representative task) involves not merely the simple matter of comparing retinal image sizes, but is a complex affair in which the entire person could be expected to participate and upon which such extraneous (to the task) matters as value, need, reward and punishment, etc., may, but need not, intrude.[1]

Even under optimal conditions the influence of these extraneous factors upon the performance of subjects is not invariant. Under the best of conditions almost all investigators report large and frequently consistent individual differences among subjects. Klein, Schlesinger, and Meister (46) say, with regard to the direction of error made by their subjects, that some tended consistently to over-estimate, while others consistently under-estimated the size of the stimulus discs while still others over and under-estimated indiscriminately. A similar finding is hinted at by Minturn and Reese (54) in a study of judgments of visual number. But over-estimation does not in itself necessarily imply an accentuating effect of a value or need intrusion. In the Bruner and Postman study (14) and in the Klein, Schlesinger, and Meister critique (46) it was observed that even

---

1. This is not to say that the necessary relationship between motivational or personality variables and perception is one of interference. But in the context of the studies discussed and the investigations we described only this aspect of all the possible relationships will be considered.

"neutral" discs were over-estimated significantly. In the latter study blank discs were over-estimated even more than discs bearing symbols. The latter study also showed that the conditions for judgment profoundly influenced the direction of error. When the disc to be judged was a bright image projected on a ground glass screen and was identical in all respects with the comparison (variable) disc, error was minimal and tended in direction more toward under-estimation. Even without these findings, which cast doubt upon the primary status of accentuation as a variable descriptive of a relationship between value and perception, we might ask as did Klein, Schlesinger, and Meister: Why should the presence of a value or a need necessarily result in accentuation?

A hint may be taken from an early study in this general area by Levine, Chein, and Murphy (50) who observed that subjects who were mildly hungry tended to associate ambiguous figures in terms of food more often than not. But when subjects were more acutely hungry these same ambiguous figures were much less often associated with food. These experimenters suggested that the effect of food deprivation could promote autism in one way when it was only mildly felt but encourage a heightened appreciation of reality when it was more severe. A somewhat analogous finding is reported by Bruner and Goodman (11), whose rich children, estimating the size of a half-dollar from memory, over-estimated far more than poor children under the same conditions. These investigators hypothesized that among the poor children fantasy is

choked off and hence the memory image of a highly valued coin leads to a relative under-estimation when compared with the direct size estimation with the coin present.

We can, at the very least, conclude that the effects of a value or need cannot be understood without reference to other factors, even under perceptual conditions optimal to elicit their effect. The latest factor to be invoked to explain such findings is the way in which people are organized to deal with values and needs. This direction of inquiry was suggested by Klein, Schlesinger, and Meister (46) and was taken up in a recent investigation by Klein and Salomon (47) and by the writer in the present study. Klein and Salomon have shown that the amount of influence of experimentally induced thirst upon the size estimation of discs bearing thirst-related pictures is directly related to the person's control pattern for dealing with potential interferences as determined by a color-word interference test.

The present study will show that the way a person is organized to deal with potential interferences has consequences not only for accuracy in size-estimation but for more general aspects of personality functioning as well.

CHAPTER II

STATEMENT OF PROBLEM AND HYPOTHESES

Before advancing some hypotheses about the way one aspect of cognitive organization may express itself in perceptual tasks, let us pause for a while to tie up some loose ends.

In citing earlier work on this problem, we have had to speak as if the effect of an intrusive need or value must be a subjective enlarging or diminishing of the stimulus object. There are a number of reasons why this may not be a useful assumption. Among them are: (a) where over-estimation has been demonstrated, it has been shown to be unrelated to the positive or negative quality of the value (14,46); (b) it has been shown not to be related exclusively to the presence of value or need stimulation; the level of difficulty of the conditions for judgment influences the direction of error and "neutral" stimulus objects are also over-estimated (19,46); (c) group performances indicating an over-estimation tendency have been shown to include both persons who over-estimate considerably and others who may even under-estimate, though not to the same extent (46); (d) many individual subjects who over-estimate on the average under-estimate at times (46). For these empirical reasons alone it would seem advisable to make no firm commitment at this time as to the ultimate significance of the directional aspect of error.

Let us return for a moment to consider the size estimation task. In a typical design the subject is asked to match the size

of a disc bearing some value or need symbol by adjusting the size of a bright disc projected on a ground-glass screen in front of him. The task is a straightforward one and all the necessary and sufficient conditions for adequate performance are provided. Also present, however, is the value or need symbol--an additional, task-irrelevant variable. The symbol, however, is not unique in this respect to the subject, for there are many other variables present, both within the subject and external to him, which are irrelevant to the accurate performance. (We might add parenthetically that its uniqueness is largely in the experimenter's eyes, for it is this of all the irrelevancies present that he expects and hopes will intrude.) It is the subject's task to focus on the few relevant variables while excluding the influence of all others. For accurate performance he must adopt and maintain a set for directed, selective attention upon the relevant variables.

Several questions may be asked about a subject in such a situation, in addition to those related to the details of the value or need symbol. First, how capable is he of making the discriminations called for? This is, in part, a question about his visual acuity--a well-designed experiment will control this. Second, how capable is he of adopting and maintaining such a set for directed and selective attention?[1] This variable is one which is not usually

---

1. Obviously visual acuity and the ability to adopt a set for selective attention cannot be independent variables since visual acuity could hardly be measured if such a set were not maintained.

considered, since it is more convenient to assume that the reading of identical instructions to all subjects insures the establishment of task-sets identical in kind, degree, durability, and efficiency. Clearly the possibility of adopting such a set is one of our perceptual "givens." That subjects in general have little difficulty in performing the task adequately testifies to the general availability of the set. The question can be raised here, if all the necessary and sufficient conditions for accuracy are present both within the situation and within the subject: Why should an irrelevant need or value stimulus influence performance at all? There is apparently no logical or physical necessity for such an influence to occur. Perhaps, then, we can re-invoke and broaden the suggestion that people may differ with respect to their coping with need or value stimulation. We would propose that people differ in their abilities to deal with intrusive irrelevancies under conditions which do not literally prevent adequate performance of the task. The concern here is not with direction but merely with amount of error.

We have spoken loosely about an ability to be accurate in the face of potential interference. But as an explanation the assumption merely of an ability to be accurate would hardly seem to do justice even to the facts already known. For instance, it is hardly plausible, in reviewing Bruner and Goodman's (11) data, to assume that rich ten-year-old children are merely better able to be accurate than poor ones in judging the size of coins. We need instead a new concept, one which is not embarrassed by the

possibility that the potentiality for concentrating is widespread or universal. (While we expect that people may differ in the degree to which their perceptual equipment permits accuracy, we would like to rule out of consideration such differences here.)

What is intended is that individuals manifest different organizations of "adaptive properties" (43) in dealing with such a task as size estimation and that these different styles of organization are one determinant of their responses.

We think of these different styles of organization as reflecting different cognitive attitudes, as the organizing principles of personal-cognitive organization are called in the theoretical framework proposed by Klein and his co-workers.[1] Klein has described the way in which persons who are organized cognitively about one or another of these attitudes employ adaptively the various potentialities and properties of the perceptual apparatus and other structural "givens" in order to maintain equilibrium between inner pressures and outer exigencies. To convey something of the flexibility of cognitive organization these attitudes have been referred to as "preferred styles" of behavior. This implies not consciously adopted predilictions but rather relatively stable "habitual" modes of behavior characteristic

---

1. A presentation of this theoretical framework and experimental support for it can be found in items (43-47) in the list of references.

of individuals under relatively wide ranges of conditions, though not necessarily "binding" upon him under all circumstances. The aim of this formulation is to account for usual and typical behaviors by-passing for the time, consideration of behavior in emergencies, under severe stress, or under other unusual circumstances.

The phenomenology of the size-estimation task suggests one possible preferred style of organization or cognitive attitude which could be called focussing. It might show itself in the habitual maintenance of a narrowed attitude which favors concentration on relevancies and ignoring irrelevancies. Such a style of organization would make for high accuracy in tasks which require the ignoring of irrelevancies for adequate performance. Focussing is intended to mean here not only the ability to take and maintain such a set for accuracy when it is appropriate to do so, but also an underlying preference for experiencing in a narrowed, discriminating way, even when the task does not demand such an approach. This is not to say that persons who easily adopt a set for directed, focussed attention will necessarily be unable to relinquish it when it is clearly inappropriate. It does imply, however, that the more the adoption of such a set is based upon this cognitive attitude of focussing, the less easily will it be relinquished when inappropriate.

It would be unnecessarily specialized and uneconomical to hypothesize a principle of personality organization solely to account for individual differences in accuracy of size-estimation. But the size-estimation task which first caught our attention may well

serve as a defining situation for a cognitive attitude which has far broader application. In more general terms we might think of a person who stressed the cognitive attitude of focussing as one who would seek out and be most comfortable with the kind of experience which can continuously be justified in terms of outer reality.

We assume that people can be ranked in terms of the extent to which they are committed to focussing. At the other end of the continuum from those who stress focussing we would expect to find persons who prefer to experience far more inclusively. Such people would be less intent upon checking their inner experiences against some "objective" fact and would be more prone to accept them uncritically for what they are. While they would be able to adopt a set for accuracy, there would be for them much less of an inner requirement to experience in such a fashion. We would expect that they would be less successful and efficient in adopting and maintaining such a set and much more prone to the kinds of interferences which task-irrelevant stimulus attributes might provoke.

We have suggested a personality variable, a cognitive attitude of focussing--which may account for some of the individual differences in performances on tasks requiring accuracy in the face of potential interference. The test of such a hypothesized variable is, of course, the operational consequences that can be derived from it.

Let us summarize our thinking about our hypothesized cognitive attitude of focussing in a definition. In the setting of this investigation we mean by:

Focussing

1. A cognitive attitude which makes use of the fact that cognitive structure is such that concentration is possible. It implies a habitual and even stressed employment of the ability to concentrate as a way of adapting to (dealing with) both inner pressure and the outer world.

2. A readiness to take and maintain a set for narrowed attention and hence a corresponding lack of flexibility in relinquishing such a set in favor of another, particularly one involving the opposed requirement, broader, more inclusive, and less critical acceptance of stimulation. While the person may be aware that he concentrates, it is not intended to define this cognitive attitude as a conscious one in the sense that in any situation the person deliberately chooses it from a variety of possible ones. It is for him the "natural" way to approach a situation.

3. Focussing characterizes people in varying degrees--we should expect to find a continuum from extreme focussers to extreme non-focussers.

This definition of focussing hypothesizes several properties for this cognitive attitude which can be tested experimentally:

1. The general hypothesis which guides this study is that people differ in the extent to which they stress focussing in their cognitive organization. They differ therefore in their ability to maintain a set for narrowed and selective attention that would permit them to carefully screen out the stimulation which is relevant at any given time from that which is irrelevant. Thus, in a task like size-estimation, which requires accuracy in the face of potentially interfering irrelevancies, those persons who are more strongly committed to focussing should find the required task-set more congenial with their natural bent. They should be more accurate than those whose cognitive organizations include an attitude for which the line between the task-relevant and the task-irrelevant is not so sharply drawn.

In order to offer experimental support for this hypothesis we must show first that people differ in the accuracy of their size-estimations in the presence of irrelevant stimulation. Further, we must show that they maintain their differences consistently enough to justify ranking them and considering their ranks to be characteristic of them. Second, we must show that a cognitive attitude is at work here and rule out the possibility that our subjects differ merely in their ability to be accurate. We must, therefore, demonstrate that knowing a subject's accuracy under conditions of judgment in which irrelevant stimulation is at a practical minimum does not permit us to predict his degree of accuracy when irrelevant stimulation is more intense. We could

further support our contention that a preferred attitude and not merely a matter of "absolute" ability is involved if we could show that the nature of the task-irrelevant stimuli is an important determinant of the extent to which people adopt a "concentrating" set and hence the extent to which they are accurate. If it could be shown that the dispersion of error scores is smaller in the total sample when the irrelevancies are more flagrant, more "eye-catching"--more interesting or provoking, and that this "shrinkage" is due largely to the improved accuracy of our erstwhile "inaccurate" subjects, then this would support the inference that among the subjects are those who tend to concentrate habitually and those who can adopt such a set but tend to do so vigorously only when stimulated by the provocative nature of the irrelevancies.

2. We have hypothesized as a property of focussing that the more a person is committed to focussing as a principle of organization, the more difficulty he will have in adopting a task-set which is antithetical to it. We must show, for instance, that subjects who "do well" in size-estimation (i.e., are accurate) tend to do relatively poorly on a task which requires a broad, non-critical acceptance of inner experience, with a simultaneous ignoring of outer standards.

Such a demonstration should help us to establish that the individual differences we describe are not between "good" and "bad" perceivers, but between people whose cognitive organization meet different adaptive prescriptions. Whether the one or the other

adaptive prescription results in a "good" or "bad" outcome, according to the experimenters' criteria, should depend on how well the task requirements and the personal adaptive requirements are suited to each other.

It is not easy to conceive of a meaningful task which meets in some degree the requirement of scoreability without also providing, at least implicitly, some external standard by means of which scores will be judged. Most tasks which come to mind demand conformance to some "objective" criterion. This task must not demand accuracy and must require a task-set which is distinctly uncongenial to a person's possible inner requirements for accuracy and verifiable experience. The task to be described below fills this bill only approximately.

The job of devising a suitable task to demonstrate our point resolved into discovering task requirements opposed to the narrowed and discriminating cognitive attitude which we have named focussing. The key to our solution lies in the presumption that this attitude favors verifiable experience. The narrow and focussed attitude refers to confirmation of inner experience in terms of facts and attributes of the "outside world." A task requirement uncongenial with this would be one which demands "unverifiable experience," experience which by its nature is not logical, or orderly, or rational and for which a facility at concentration would be more a handicap than a help.

Detailed procedures of this task and its construction are stated in the following section; let us describe it here in more general terms. The task is one which requires subjects to sort sixty pictures into three piles solely on the basis of the instantaneous, initial feeling of liking or dislike which the picture inspires in them. If the picture inspires no feeling at all, it is to be placed in the middle "indifferent" category. The pictures range widely from innocuous and even dull representations through a number which are of considerable human interest to a few that are either gory, aggressively toned, or sexually provoking. The instructions specifically direct the subject to abjure any conventional, external standard for his choices. He is to respond only to his own transient emotional state.

The task set required, therefore, is such as to make that which was irrelevant in the size-estimation task relevant in the present task. In the one situation the expectation of the subject was that he should ignore the value or need stimulation as well as other irrelevant stimulus-attributes and concentrate upon the stimulus-attribute of size alone. In our picture sorting task it is only these former irrelevancies and their emotional impact upon the subject which are relevant. It would follow from the nature of the cognitive attitude we have posited that people who for adaptive purposes stress a narrowed and focusses outlook as the motif of their experiencing would find it difficult to adopt a task set so antithetical to this. On the other hand, a person

whose adaptive requirements favor more inclusive experiencing should have far less difficulty in adopting such a task set.

Since there is no external standard of right or wrong for this task we can judge a subject's performance only by the way he copes with the task requirement. It is necessary to assume that responses of "like" and "dislike" actually reflect emotional experiences which were recognized and acted upon by the subject. Responses of "like" or "dislike" will be taken to mean that the subject allowed the emotional impact of the picture to influence his behavior. Whether the response was "like" or "dislike" is not pertinent to our argument. The response "indifferent", however, is of a different order. While it is permitted by the instructions given the subject, its use indicates that despite the directive, the emotional impact of the picture, if any, did not influence the subject's behavior. It seems a truism that anything, particularly a picture, has the potentiality to arouse some degree of feeling about itself in an observer who is set to recognize such feelings. We can therefore legitimately ask whether subjects who are completely capable of adopting the spirit of the instructions for their task-set could meaningfully use an "indifferent" category of judgment. The experience of indifference, after all, implies the absence of feeling. Since the spirit of the task requirement is for the subject to open himself to his feeling, a judgment of "indifferent" indicates difficulty in adopting the required set. For this task, therefore, the number of "indifferent" choices is the criterion by which we will judge the degree of difficulty which the subject experienced

in adopting the required set.[1] We must demonstrate a negative relationship between accuracy in size-estimation and the number of "indifferent" choices in the picture sorting test.

3. It is a vital point in our argument that with respect to their interference with size estimation, values and needs, and more generally, emotional stimuli can be considered merely one class of irrelevancies among many which must be ignored by the subject. This is too broad a claim to be tested fully in this investigation, but a demonstration crucial to our argument and supporting of the broader claim can be made. Our size-estimation task required judgments of discs of two major classes, those bearing pictures with emotional connotations called the "emotionally-loaded" (EL) discs, and those faced in different colors and textures and of different weights which we called "neutrally-loaded" (NL) discs. Each class offers a different order of task irrelevant stimuli. In terms of our hypothesis, however, these should have similar effects on accuracy. In order to offer experimental support for this hypothesis we must show that the error associated with "emotionally-loaded" discs is predictable from error on "neutrally-loaded" discs.

4. Up to this point we have described operations that could test several assumed properties and consequences of our hypothesized

---

1. Other indices of this, including the subject's subjective experience, will be discussed below.

cognitive attitude, all of which are vital to its claim to be a principle of cognitive organization. But we have used the term cognitive organization as if it were for some purposes synonymous with personality organization. Having assumed that focussing, among the other cognitive attitudes, underlies cognitive experience, it seems plausible that it should have links to personality organization in general. In particular, our discussion of focussing suggests that the aspect of personality organization which has to do with the availability of emotional experience and the expression and control of emotions may be closely linked to our cognitive attitude. We propose that people whose cognitive functioning is organized about a narrowed and focussed attitude under the influence of which they prefer to exclude emotional influences as irrelevant will differ considerably in their general emotional experience from those whose cognitive functioning is not so organized.

It is difficult to find adequate tests for hypotheses about personality traits. While prolonged clinical investigation might give us the information we desire, it would hardly be feasible in the context of this study. The various psychological tests, particularly projective techniques, might lend themselves to our purpose, but since the answers to our questions via this route could be given only by complex interpretations of test responses which themselves refer to perceptual behaviors, we would be traversing a circular path rather than leaping to another level of theorizing. The solution adopted for this study was to cut the Gordian Knot

by asking the subjects to describe themselves with respect to their own emotional experiencing. An inventory was constructed (to be used for other purposes as well) which included a number of items pointed at emotional experience, and our subjects were asked to rate themselves. While we are in a sense employing an unvalidated "personality test," it is proposed that the items themselves have high "face validity." They can be so directly related to the questions asked that this need not be an objection.

It seems reasonable to expect that subjects who stress this cognitive attitude of focussing should be characterized in their emotional experience by relatively firm control over emotional expression, should tend to be in a relatively poor communication with their emotional processes and little given to acting with conviction, especially impulsively, on the basis of their feeling states. On the other side, they should prefer to think things through before acting, to prize being objective and dispassionate, and to rely with more confidence upon their thinking than upon their feelings. We would expect subjects who are at the other end of the continuum to be constantly in freer communication with their feelings and to be much freer and more open in their experience and expression of emotion. They should have greater conviction concerning their feelings.

The demonstrations described thus far lead us step-wise in the testing of our hypothesized cognitive attitude from defining

perceptual task to an aspect of personality functioning which would otherwise have no apparent link to perception. We might ask further: How useful is focussing in predicting individual differences in other perceptual tasks requiring the subject to ignore intrusive irrelevancies? Since there is hardly any limit to the number of tasks meeting this simple description, we can only expect to point toward an answer to this question. Two other perceptual tasks were performed by our subjects. One of them, a distance estimation task, was designed to have the same formal structure as our size-estimation task. All the conditions for an accurate (monocular) distance match (on the basis of size cues alone) were provided, while other task-irrelevant stimulus attributes which might be, but need not be, interfering, also were present. For a number of our subjects the size cue alone was not sufficient to make a distance estimation. For these subjects the matching of the sizes of the stimulus-cards was phenomenally quite different from a distance match of the same cards. The findings from this test were thus completely equivocal and have little relevance for the present problem, though they point to an interesting phenomenon deserving investigation in its own right. They will be omitted from this thesis. The other task was the familiar color-word interference test developed by Stroop (78). While quite a different task from either size or distance estimation in that speed as well as accuracy is required, this test was included because it is one frequently thought of in connection with interference by a task-irrelevant variable.

Let us summarize the main points to be tested.

1. The general hypothesis under which this investigation is conceived is that people differ from each other along a continuum with respect to the degree to which they stress focussing in their cognitive organizations.

2. Stress on this cognitive attitude should make easier the adoption of a set for accuracy when the task requires such a set. The congruence of the cognitive attitude and the task requirement should make for high accuracy on the defining task, size-estimation.

3. Conversely, when the task requirement is changed so that it is incongruent with the cognitive attitude, persons whose cognitive organizations stress focussing should find it difficult to adopt the appropriate task set.

4. Focussing should also promote the effective adoption of a set for accuracy when the nature of the irrelevant and interfering stimuli is not in itself such as to provoke special efforts at discrimination or a particularly watchful attitude. Accuracy on "neutrally-loaded" (NL) discs should predict accuracy on "emotionally-loaded" (EL) discs.

5. It is further hypothesized that the cognitive attitude of focussing has relevance not only to perceptual experience, but also to areas of personality functioning--particularly the experience, expression, and control of emotions. Those persons who stress

focussing in their cognitive organizations should describe themselves as being relatively unemotional, in stricter control of, and having less conviction in their emotions than those who do not stress this attitude.

6. If focussing has general applicability in explaining individual differences in perceptual tasks requiring accuracy or efficiency in the face of irrelevant, interfering stimuli, then we should be able to predict from our defining task to other tests falling under this description.

CHAPTER III

EXPERIMENTAL PROCEDURES

Experimental Tasks

The five experimental procedures used in this investigation were first tried out in a pilot study with 16 subjects. The aims of the pilot study were: (a) to see if large enough and consistent enough individual variations would occur in these tasks to permit the kind of explanation we had in mind; (b) to see if our subjects' performances were self-consistent among the tasks; (c) we wanted to secure information to help us select the most effective task-stimuli and methods of presentation for the full investigation.

Size-Estimation Test[1]

Since the size-estimation test is one which has been frequently used to demonstrate such effects as "accentuation" and since it was also used by investigators offering critiques of the theorizing and methodology of such investigations (46) it was decided to use this task as the central one of this investigation. It was used as the defining task for *focussing*, i.e., it furnished criterion measures of accuracy from which the degree of stress among our subjects on the cognitive attitude of *focussing* was inferred.

In the full investigation the test was conducted as follows: The subject was seated at a table facing a black box, 18 inches long,

---

1. Procedures are described in the order they were given to the subjects.

18 inches wide and 9 inches deep. The front panel of the box held two circular ground-glass panes each 4 inches in diameter and 8.5 inches between centers with the ground faces inside. Close behind the right hand pane was mounted a 12-leaf iris diaphragm, linked mechanically to a knob in the upper right-hand corner of the face of the box. The diaphragm opening cast a shadow on the ground-glass screen which defined a bright disc. Its diameter was adjustable from 15 to 59 millimeters and could be read on a scale at the side of the box. The scale faced the experimenter and was outside the subject's view. While the variable disc was not actually a true circle, the 12 elliptical leaves of the diaphragm cast a shadow which was all but indistinguishable from a true circle in the range from 40 to 59 millimeters in diameter--a range which includes nearly all of the size-estimations of our subjects. Only a few subjects commented on the slight irregularity of the outline and none reported any difficulty in making the judgments required.

Behind the left-hand pane was a standard lantern slide holder. During this experiment the slide holder contained a piece of black paper with a circular cut-out which, when illuminated from behind, cast a shadow on the ground-glass screen. The bright, circular patch was exactly 50 millimeters in diameter. Each field was illuminated from behind by its own 25-watt, standard, frosted bulb enclosed in a metal can having a quarter-inch aperture at the end facing the panes. This arrangement of lamps and apertures

cast sharp shadows of both the diaphragm and the prepared lantern slide on their respective ground-glass panes and gave field intensities of 2.7 foot candles. Since the intensity of the illumination of a ground glass screen dropped off sharply as the subject's line of vision departs from the axis of the illumination system, the box was tilted to suit the height of the subject so that he looked directly at the ground glass panes from a distance of about 18 inches.

In the full investigation the task consisted of four parts. The subject was seated comfortably at the apparatus and it was adjusted to suit him. The working of the diaphragm by the knob was demonstrated and the subject was allowed to try it out for himself.

I. Pre-tests with identical stimulus-discs:

Both ground-glass fields were illuminated. The subject was directed to make the right-hand variable field exactly the same size as the left-hand standard field. The following instructions were given:

> "You are to make the right-hand disc exactly the same size as the left-hand disc by turning this knob. When you are satisfied that they are exactly the same size, take your hand off the knob. There are no time limits to this. You may work at your own comfortable pace."

Once the task was understood by the subject four ascending[1] and four descending trials were given in order A, D, D, A; A, D, D, A. The purpose of this first pre-test was to provide an indication of the subject's accuracy at size estimation when both standard and comparison were identical--both were projected discs of the same brightness and color lying in the same frontal plane. The two discs were projected at slightly different heights on their ground glass screens so that the subject would have to compare the two discs rather than the distance from the disc to the edge of the pane. Under this condition for size estimation the amount of irrelevant stimulation contributed by the field was minimal. Better conditions for accuracy could hardly have been realized save by moving the two fields closer together in space.

II. Pre-test with light and heavy gray discs:

The illumination of the left-hand field was turned off and the subject was handed a gray-painted disc 1/4" thick and 48.5 millimeters in diameter. He was directed to hold this as demonstrated in the palm of his hand adjacent to the variable stimulus field and in a manner comfortable to him. He was encouraged to rest his left elbow on the table and to find a position that he could hold comfortably for some time. Again the subject's task was to adjust the projected, variable disc to exactly the same size as the disc held in his left hand. The instructions given the

---

1. Ascending refers to those trials which began with the variable disc smaller than the standard. Descending refers to those trials which began with the variable disc larger than the standard.

subject were the same as for Part I modified for the different condition for judgment. The subject was also warned to keep his left hand against the face of the box and not to move it any closer to the variable disc than was demonstrated, if these added instructions seemed necessary. Two ascending and two descending trials in order A, D, D, A were given successively with this gray disc.

An identical gray disc which had been hollowed out on the reverse side and weighted with lead was then substituted for the first gray disc and four more trials taken in the same way. This was then followed by four more trials with the light gray disc and another four with the heavy gray disc. Through this procedure a "weight-size" illusion could be tested for. The difference in weight between the two gray discs (10.9 grams and 58.5 grams) was very apparent to all subjects, most of whom commented with surprise at the unexpected weight of the heavy gray disc.

III. Main portion of test:

The subject was presented with 12 discs, one at a time. Each disc was judged only once until all 12 had been seen. Four such series were given with the order of presentation within each series randomized. Thus 48 judgments in all were made. Two of the four series were given as ascending judgments and two descending judgments in order, A, D, D, A. The instructions given the subject were the same as for Part II except that the subject was told to

return the disc to the experimenter after each judgment. The 12 discs ranged from 48.5 millimeters in diameter to 52 millimeters in diameter. This slight variation in size was introduced in order to break up a possible set of "sameness" and to help assure that each disc would be judged individually.

Five of the discs represented the variables of color, weight, texture and reflectivity. These were task-irrelevant differences which might have, but need not have, intruded upon the size estimation to be made. These five discs included the light gray (Gray)[1] and heavy gray (H'v'y.) discs used in preliminary testing, a disc faced with black velvet (Bl'k.), a disc faced with red construction paper (Red) and a disc faced with yellow construction paper (Yel.). These five will be referred to as the "relatively-neutrally-loaded" discs, and abbreviated as NL discs. Five other discs were each faced with a picture having emotional connotations. These pictures included a posing, all-but-nude, "muscle-man" (Man), a photograph of an electrocution (Elec.), a nude woman lying prone on a bed (Prone), a rather fuzzy photograph of a nude woman from the waist up (Fuz.), and a photograph of a couple in a passionate embrace (Cl'ch.). All of these pictures were cut-outs from magazines and completely covered the face of the discs. No margins showed. The pictures were such as could (and did) pass through the mails as parts of photographic magazines or as magazines "for

---

1. The abbreviations in parentheses are those used to designate each disc in Figure 1 and Table VIII.

men only," and none of them was really pornographic. This series of five discs, then, bore pictures which because of their content and explicit affective appeal might interfere with the required size estimations. These five discs will be referred to as the "emotionally-loaded" discs, and abbreviated as the EL discs. While the "emotional loading" of the EL discs was at first presumed, inquiry following the test established that they were, in fact, more "interesting" and provocative. All subjects indicated that they were not unduly bothered by the content and some openly expressed a preference for them. The subjects' spontaneous and requested reactions fully bore out the presumed difference in affective connotation of the NL and EL discs.

The other two discs of the series bore pictures with no such explicit affective connotations. One bore a photograph of a straw beach hat taken from above (Hat). Because of the shadows cast this could be seen either in correct or in reversed perspective, i.e., either as a hat or as a kind of tunnel. The other bore a photograph of a rather ornate chair with a round upholstered seat (Ch'r.). The picture was mounted so that the chair seat was almost concentric with the edges of the disc. Both of these were included because in pilot testing their optical illusion character seemed to provoke difficulties which were commented upon by the subjects. The reversible perspective of the one and the round chair seat of the other tended on the whole to interfere with accurate size estimation. These two discs will be referred to as the "illusion discs," and abbreviated as ILL discs.

IV. Post-test with identical stimulus discs:

This was a repetition of Part I and the conditions and instructions were identical with that Part. This last series of trials was included in order to provide a check upon possible fatigue, boredom, and learning or other effects which might cause a change in performance over time. Since both stratification and randomization were employed in ordering the four trials for each disc, temporal changes were minimized by the design.

No rest period was given during the course of this test, other than the brief interval between Parts, unless the subject asked for it. The subject was urged and helped to make himself comfortable before beginning the test in order that he might deliver his optimum performance. Normal room illumination prevailed throughout the test. Following the test the subject was allowed to express himself freely about it, and this led into an inquiry into his experience with it, particular difficulties, etc.

The scores for the several parts are given in terms of total amount of error, i.e., with the signs of the errors ignored. The basic score is the total amount of error for all 4 trials on each disc. To obtain a comparable figure the sums of the errors for Parts I and IV, where 8 trials were given, were each divided by two. Average errors for each one of three classes of discs, ML, EL, and ILL, were obtained by dividing the total error for the class by the number of discs in the class.

In the pilot study 20 discs had been used. These included additional discs in all three classes. The 12 discs for the full investigation were those in each class which produced the most error. The pilot study differed from the full investigation, too, in that the four trials for each disc were given successively.

Picture Sorting Test:

The subject was seated at a table in ordinary room illumination. He was given the following instructions.

> "I have here a stack of cards which I want you to place in three piles in front of you. It is most important that you understand the basis on which you are to sort these pictures into the three piles. I want you to look at each picture in turn and put it into one of the three piles depending on the instantaneous feeling which the picture inspires in you. If the feeling which the picture inspires in you is one of liking, put the picture in the pile at your right. If it is one of dislike, put it in a pile to your left. And finally, if the picture inspires in you no feeling at all, one way or the other, put it in the middle. There are no standards for this test; the only thing that matters is the immediate feeling which each picture may arouse in you. I specifically do not want you to make any judgment about the picture's artistic quality, style, or technique, the artist, should you recognize him, or anything else of that kind. This is not to be an artistic or critical evaluation of any kind of the pictures. I merely want you to react to each picture in terms of the first feeling which it arouses. Only if it arouses no feeling at all are you to place it in the middle pile. You do not have to justify your sortings. There are no right and wrong answers and it does not matter which picture ends up in which pile or how many end up in any pile. This is not a test of speed either, work only as quickly as is comfortable for you. At whatever pace you work, please work steadily without interrupting the task for questions or anything else until you are finished. Please hold the cards in your lap and sort them one at a time into the three piles."

Any questions which the subject had about these instructions or what he was to do were answered, as far as possible, by repeating appropriate portions of the original instructions. Any particular difficulties which the subject experienced in grasping the instructions were noted on the data sheet. The subject was helped to understand as well as he could the kind of performance which was expected and only after this appeared to be accomplished as well as it could be was the test begun.

The experimenter noted the exact time at which each card was placed by means of an electro-magnetic pen connected to a continuous-feed kymograph. The subject was told that the experimenter would do this but that it was not intended to hurry him. Each subject was asked and none reported any feeling of time pressure on this test. Any special signs of indecision were noted as were changes in sortings, spontaneous remarks, gestures or other indications of the subject's state during the test.

At the end of the test the subject was allowed to express himself spontaneously if he wished to do so, and if it was not apparent from his comments, a systematic inquiry was conducted into the degree of difficulty or comfort he experienced, what he thought he was doing, how natural the task seemed to him, and whether he customarily experienced in the terms that the task required.

Special stress was placed in the inquiry upon what the subject experienced in connection with indifferent choices, particularly to see if these were really accompanied by no feeling at all, or if perhaps equal but opposite feelings were present, or if slight feelings were present which were not above some subject-established criterion level for sorting of pictures into either like or dislike categories. The subject was then asked if there were any pictures which he sorted into the indifferent category not so much because he had no feeling at the time about them, but because he would prefer not to express any feeling about them. He was then asked if any of the pictures in the like category were put there not so much because the immediate feeling he got for the picture was one of liking, but because he felt he ought to put the picture into that category, i.e., this was "the sort of thing one was supposed to like" or "people should like this sort of picture." Similar questions were asked about the dislike category. If the subject showed any indication that he had experienced anything like this the individual cards in each sorting were reviewed with him and the basis for each sorting noted. The few instances of marked indecisions noted during the test were inquired into as well.

The basic score for this test was the number of cards sorted into each category. Our hypothesis related only to the number of pictures sorted into the indifferent category. The average times for each of the judgment categories as well as for the task as a

whole was computed as an additional datum of possible interest but without any hypothesis about them.

The materials for this test consisted of 60 pictures, mainly cut-outs from magazines and other periodicals, each mounted on a 7 x 7 inch, white, cardboard mat. The cards were numbered serially in their lower right-hand corners but were not marked in any other way. The pictures were quite varied in content, style of execution, artistic quality and purpose. They included news photographs of hungry Korean children, reproductions of modern abstract paintings, children's drawings, monochromatic lithographs, nude photographic studies, portraits, etc. The range of emotional stimulus-value was very wide. In the pilot study none of the pictures was chosen universally as liked, disliked or indifferent although a number of them showed fairly consistent trends toward the one or the other pile. No picture was chosen consistently as indifferent. The pictures themselves are not reproduced here partly because of the difficulty in obtaining the copyright holders' permission and more importantly because the findings appear to be due less to particular qualities of the pictures than to a response-tendency among our subjects. It appears doubtful that the particular pictures used are of great significance for the problem or results.

Color-Word Interference Test (78):

The subject was seated comfortably at a table under ordinary room illumination. He was given the following instructions:

"This next is a test of speed and accuracy. I want to see how fast you can read a page of color-words which I will hand to you."

The experimenter handed the subject sheet A, a practice sheet consisting of a letter-size sheet of white paper mounted on stiff cardboard. On this was typed in black a list of 100 color-words (red, blue, green, and yellow) in random order, ten words to a line, and ten lines to the page. At the head of the page was one additional line spaced away from the rest and intended for practice. Covering all but the practice line with another sheet of paper the experimenter told the subject:

"Read this top line for practice aloud, as quickly as you can, like this."

The experimenter then quickly read the first few words clicking his stopwatch conspicuously as he started.

"Now you begin and read the words on this line as quickly as you can."

If the subject evidently read the words with real effort to read quickly, he then was allowed to read the rest of the page while the experimenter timed him by stopwatch, noting the time for each two lines. If the subject did not seem to be reading at his maximum speed he was encouraged to try the practice line again with the speed demand emphasized. When the subject finished this first sheet it was removed and he was handed another sheet, sheet B, laid out exactly like the first except that instead of words it had a series of X's occupying the

same spaces and positions as the words on the first page. These X's were each typed in a different color (again red, green, yellow, and blue) but in such a fashion that no color appeared where its color name appeared before. The subject was again shown the top practice line and told:

> "Now I want you to read aloud as quickly as you possibly can the colors which you see here."

The experimenter again demonstrated and timed the performance in the same fashion as for the first sheet. All errors, corrections and hesitations were noted. When the subject was finished the experimenter removed this sheet and handed him a third one, sheet C, which had on it the same arrangement of color-words as on sheet A but printed in the same colors as were on sheet B. On sheet C no color-word appeared in its own color. The administration was again conducted and timed as for the other two sheets.

Following the task an inquiry was made into the subject's experiences. The basic score is the ratio of the time needed to read the colors with the words interfering to the time needed to read the colors alone. This is abbreviated in Table VIII as C/B. The subject was penalized for uncorrected errors by the addition of one unit time for each uncorrected error.

Personal Inventory

The subject was seated as he was for the color-word test and picture-sorting test and was handed a booklet. He was asked to read the cover sheet which contained instructions and then, if he had no further questions, to proceed. The inventory consisted of 139 items. He rated each item on a seven-point scale in which 1 signified "completely true" for him, and 7 "completely false". A rating of 4 indicated "neither true nor false" for him. If the subject preferred not to answer a question on personal grounds or if he did not understand a question, he was free to omit it. He was specifically instructed to answer each question individually and not to attempt to be consistent.

The core of the inventory for the purpose of this investigation was a group of 46 items (see Table X) which were scattered throughout the inventory and which related to aspects of the subject's emotional experience, control and expression. These 46 items included 24 which should have been answered true in some degree and 22 which should have been answered false in some degree by an "ideal person" who could be described as completely "free" in his affective life, i.e., one who communicates easily with his feelings, expresses them easily, and feels a minimum need for special efforts at affective control. Thus the way that this cluster of 46 items was constructed provided a key (established a priori by the experimenter and checked independently by two other clinical psychologists) to evaluate responses to these items. The

basic score for the inventory was the number of responses out of a possible 46 which agreed with the key. For this purpose a rating of 1, 2, or 3 was counted as true and a rating of 5, 6, or 7 as false. Ratings of 4 were merely not counted. Thus a high score indicated good agreement with the key, implying great freedom of affective expression, easy communication with his feelings and minimal necessity for special efforts at affective control. Agreement with this key was used to evaluate the emotional experience, control and expression of subjects scoring high and low in accuracy on the size-estimation task.

The balance of the inventory was composed of additional clusters of items concerned with various other aspects of behavior and experience not directly related to the hypotheses to be tested in this investigation. For the purpose of this study they served merely as "filler" items.

Summary of Experimental Procedures:

I. Size-estimation test: The subjects matched the size of twelve hand held discs with a variable disc of light. Four trials were given for each disc. Five of the discs (NL) were faced with different colors, textures and different from each other in weight and thickness. Another five (EL) differed from each other only in being faced with different sexually or aggressively toned pictures. Two other discs (ILL) were faced with pictures which had no particular emotional connotation but

whose circular designs might interfere with size estimation. This main portion of the test was preceded by eight trials for each of a light and heavy gray disc from which it was hoped to gain a measure of "size-weight illusion". The test as a whole was preceded and followed by eight trials in which the subjects matched the size of an illuminated disc on a ground glass surface identical with and adjacent to the variable stimulus disc. This was intended to provide a measure of accuracy under conditions of minimum irrelevant and interfering stimulation.

II. Picture sorting test: The subject sorted sixty pictures varying in content, style and emotional impact into three piles according to whether the first feeling inspired in him by the picture was one of liking, dislike, or left him with no feeling at all. The instructions stressed that the subject was to take a set of responding to his first feeling about each picture and to use the indifferent catogory only if no feeling was aroused.

III. Color-word interference test: The subject read first, for practice, a sheet bearing 100 color words, red, green, yellow and blue, repeated in random order. He then read as quickly as possible a similar sheet containing the actual colors themselves. Following this he read, again for speed, the same 100 colors when these were the colors of the ink in which conflicting color words were printed.

IV. Personal inventory: The subject rated 139 items relating to his personal behavior and experience on a seven point scale ranging from completely true for him to completely false for him. Forty-six of these items constituted a scale measuring the experience, expression and control of emotions. Only the ratings of these 46 items will be considered here.

The battery of procedures was given in almost every case during one session which lasted between 1½ to 3 hours. This wide range resulted from the policy of allowing each subject to work at his preferred pace (in all except the color-word interference test).

SUBJECTS

Forty subjects comprised the sample for the full investigation. Of these 29 were women and 11 were men ranging in age from 18 to 30. Their mean age was 23.6. The subjects were drawn from two main sources: 8 of them were sophomore and junior university students who volunteered with the understanding that they would be paid for their time. Thirty-two were employees of the Menninger Foundation, (clerical workers, adjunctive-therapy students and staff members and nurses) who volunteered as subjects with the understanding that the testing would be done on work time. Some of the students were, at the time of testing, enrolled in psychology courses but none were familiar with the area of this investigation. No independent measure of intelligence was available

for the subjects, but a rough estimate of intelligence level is provided by the fact that 31 of them either were then attending or had attended some college or university. Thus it can be safely presumed that the subjects were of at least normal intelligence, mostly above average. Since all of the tasks required at least normal visual acuity, no subject was accepted whose vision was not correctable to normal standards (20/20) with glasses. No subjects were color-blind.

Each subject was tested individually. Subjects were introduced to the testing with an explanation that the experimenter's interest was in the possible connections between a number of perceptual tasks which outwardly seemed quite different. Their interest was solicited. All of the subjects had expressed their interest initially by volunteering, the small payments made could hardly have served as a major incentive in view of the travel and inconvenience which appointments entailed. Nearly all subjects expressed their interest at the close of testing to volunteer for additional research if they were needed.

STATISTICAL TREATMENT

The scores yielded by each of the tests are:

Size estimation test: All scores are given in terms of total amount of error, i.e., with the signs of the errors ignored. The basic score is the total amount of error for all four trials on each disc. To obtain a comparable figure the sums of the errors

for Parts I and IV, where eight trials were given, were each divided in half. Average errors for each one of the three classes of discs, HL, EL, and ILL, were obtained by dividing the total error for the class by the number of discs in the class.

Picture sorting test: The basic score is the number of pictures out of 60 sorted into the indifferent category.

Color-word interference test: The basic score is the ratio of the time needed to read 100 colors with conflicting color-words interfering to the time needed to read 100 colors without interfering color-words.

Personal Inventory: The basic score is the number of agreements between the subject's ratings of 46 items pertaining to emotional experience and a predetermined key devised for an ideal "emotionally-free" person.

The experimental design lends itself best to correlational analysis and product-moment correlations are referred to throughout. But we will also have recourse to a cruder measure of association, chi-square. The reason for this is that many of our data (from the picture sorting test and inventory), while having the outward appearance of exact quantification, are probably of relatively low precision. For these data a measure of association committed only to such a broad distinction as, above or below the median, seems more appropriate than a precise, sensitive measure of

relationship. In some instances to follow, the use of both types of measures where the most precise would serve may seem redundant. But in other instances, where the scattering of scores lowers the significance of the more sensitive correlation coefficient, chi-square, presuming less about the data, may indicate an appreciable association and represent matters more fairly. Since the four-fold tables from which chi-square is computed will generally have a theoretical frequency for each cell of only ten, the Yates correction for continuity is used throughout.

CHAPTER IV

QUANTITATIVE RESULTS: SIZE-ESTIMATION TEST, PICTURE SORTING TEST, AND COLOR-WORD INTERFERENCE TESTS

A summary of the data of the full investigation is presented in the appendix. The subjects are ranked in order of their average error in size-estimation of the NL discs. Subject #1 is most accurate and subject #40 least accurate. These error scores will be used as the best measure of the hypothesized cognitive attitude of focussing.

The comparable findings for the size-estimation task of the pilot study (N = 16) were analyzed by means of a double classification analysis of variance. (See appendix.) These showed that the primary variables (subjects and discs) were significant at better than the one per cent level. The interactions (subjects x discs) also tended to be significant. Because of the definiteness of these findings, which in effect only confirm previous findings (46), this analysis was not repeated with the data from the full investigation. This analysis answered only one of the questions which we must put to the data. By assuring us that within the task subjects tend to err consistently upon the various discs, they make it reasonable for us to attempt to explain the consistency.

Let us then see how well our hypothesized cognitive attitude can explain the consistencies and differences in the data. Let us look first at our defining task, the size-estimation test.

We should expect, if the presence of value or need in itself leads to greater error, that the average error on the EL discs should be larger than the average error on the NL discs. The difference, however, between 8.03 mm. for the NL discs and 7.41 for the EL discs, is not statistically significant. All we can say is that the presence of the irrelevant need or value did not lead to greater error than other kinds of irrelevancies.

The findings offer encouragement to our hypothesis that a cognitive attitude is involved here. This hypothesis led us to expect that the differences in accuracy among our subjects would be greatest when the irrelevant stimulation was least provoking, i.e., in a sense more "subtle" or "insidious." Under such circumstances, those subjects who would be prone to focus sharply in any case would do so, while those not so inclined as a preferred mode of adaption would find little provocation in the nature of the irrelevancies to focus sharply. When the irrelevancies are more flagrant and attention-demanding, we should expect that even those who are not habitual focussers will be provoked into more acute concentration. We can see too that the individual differences in accuracy tend to be smaller on the EL than the NL discs. The standard deviation for the NL discs is 4.59 mm. as compared with 3.72 for the EL discs. The difference is in the expected direction but not quite large enough to be significant at the .05 level.

In order to establish our thesis that the individual differences in size-estimation among our subjects can be explained in terms of a cognitive attitude it will first be necessary to rule out the more obvious explanation that they differ merely in perceptual acuity. The experimental design used offers several checks upon this question and these will be taken up in their context in the discussion of results to follow.[1]

We can find support in the data for our expectation that subjects who are habitual focussers (i.e., very accurate on the NL discs) should be little affected by the nature of the irrelevancies present in the field as compared with subjects who are not habitual focussers (i.e., very inaccurate on the NL discs). As can be seen from Figure 2., the mean difference between the average errors on the EL and NL discs for subjects 1-10 (most accurate) is + 2.21 mm. For subjects 31-40 (least accurate) the mean difference is - 4.47 mm. The difference between these two mean differences is significant at better than the .01 level. The plus and minus signs of the mean differences indicate that the focussers tended to have somewhat greater error on the EL than the NL discs while the non-focussers showed a significantly larger decrease in error in this comparison. The decrease in accuracy of the focussers on the EL discs raises a puzzling question for which no answer is immediately apparent.

---

1. References to this issue will be found on pp. 48, 49, 51, and 52.

We can suggest that the focussers are working at their maximum efficiency so that any additional stress or distraction such as is afforded by the EL discs can only impair their performance. The non-focussers who we presume are working at less than their maximum capacity for focussing may be provoked by the attention-demanding nature of the EL discs to focus more effectively. We can conclude, however, that the difference between the SD's of the EL and NL distributions reflects in large part an increase in accuracy of the "non-habitual focussing" subjects in connection with the more obvious irrelevancies of the EL discs. This finding also tends to argue against the possible objection that the differences in accuracy are due to differences in the trait, "ability to be accurate," among our subjects.

Further light can be shed upon this issue if we depart, for the moment, from the a priori NL and EL breakdown of the discs and choose instead an operational definition of the "interference potency" of the discs. Let us compare our focussers and non-focussers on those discs which yielded the largest and the smallest errors for the entire population of 40 subjects. Such a breakdown cuts across the NL and EL categories and is not, of course, an independent one. As can be seen from Figure 1., the high-errors discs are the "heavy," "gray," "black," "man," "fuzzy," and "prone" discs. The low error discs include the "red," "yellow," "chair," "hat," "clinch," and "electrocution" discs. This comparison is presented as part of Figure 2. It is obvious (considering only these 20 extreme

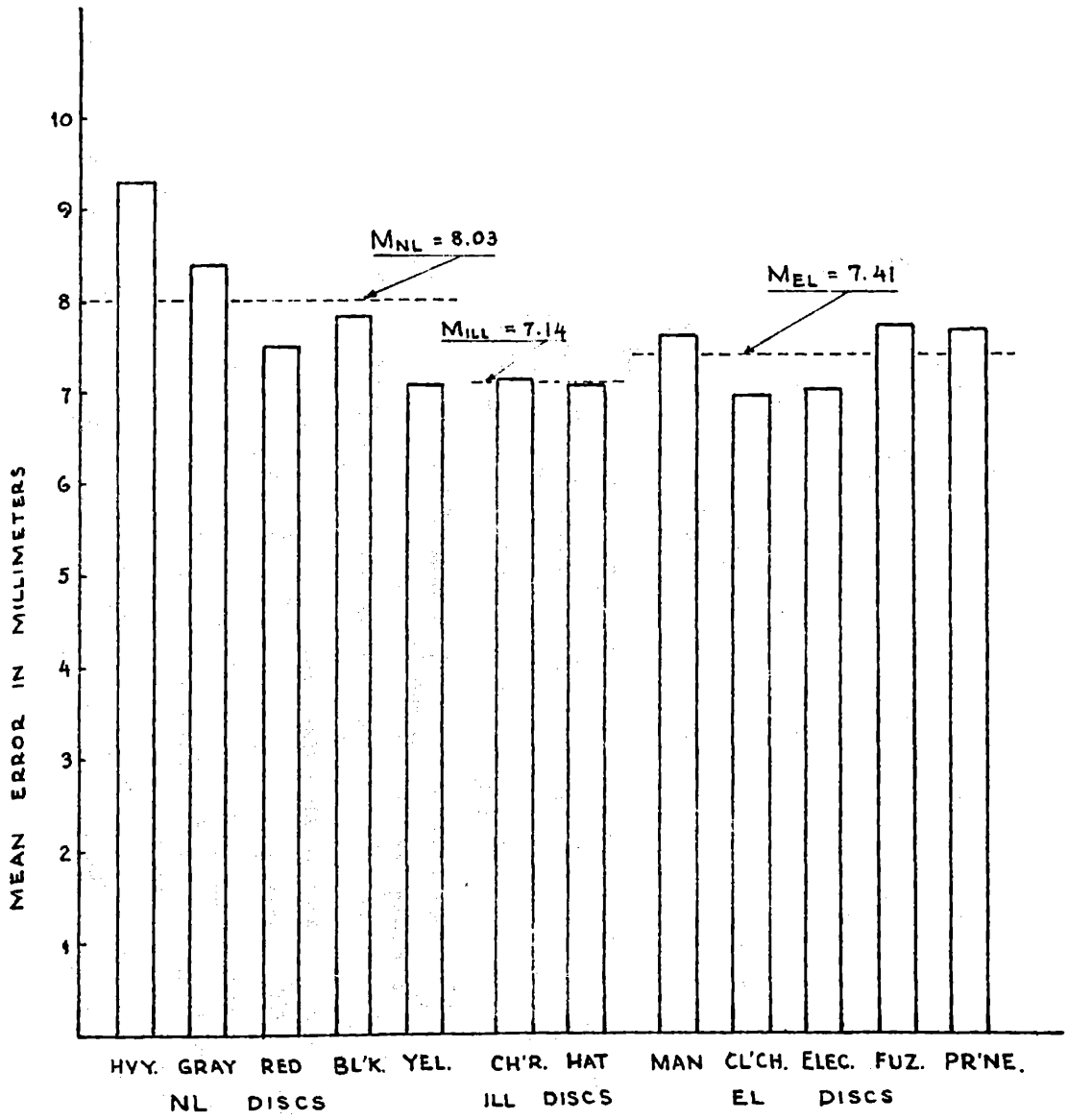


Figure 1. Size-estimation test. Mean error scores for 40 subjects.

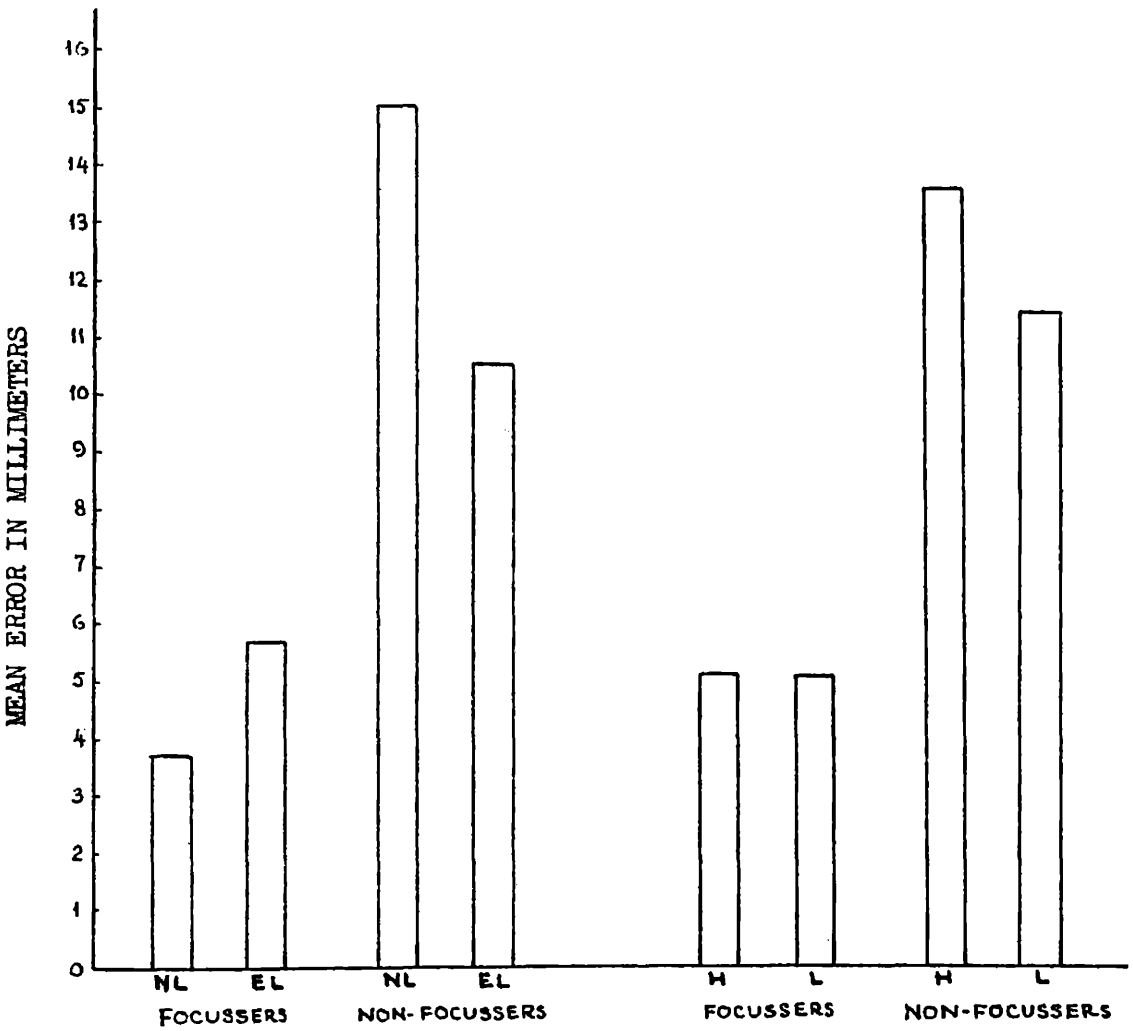


Figure 2. Size-estimation test. Comparison of mean error scores of focussers (N = 10) and non-focussers (N = 10) on five neutrally-loaded (NL) and five emotionally-loaded (EL) discs and on six high error-provoking (H) and six low error-provoking (L) discs.

subjects) that the difference between those discs most productive of error and those least productive of error is contributed only by our non-focussing subjects. This finding offers some additional support for the contention that the prime difference between these groups of subjects is not in absolute ability to be accurate by re-emphasizing that the degree of accuracy attained by the non-focussing subjects varies considerably depending on the discs judged.

In order to help preclude the possibility that differences in general ability to be accurate among our subjects might confound the picture, we had selected subjects whose vision was correctable to normal standards. We have, however, further experimental checks upon the "ability question." In addition to judging the hand-held NL, BL, and ILL discs, each subject also estimated the size of a projected disc of light equivalent in all respects to the variable stimulus. Under these conditions of judgment irrelevant stimulation in the vicinity of the comparison field was reduced to a minimum. We should expect smaller errors under these conditions than with size-estimation of hand-held discs. If an ability factor is at work, however, we should also expect to find a relationship between errors in this situation and errors in connection with the three classes of discs. Figures 3, 4, and 5 are scatter diagrams plotting errors under conditions of identical standard and comparison discs against each of the three classes of hand-held discs. The scatter diagrams clearly indicate no appreciable relationship. The two-by-

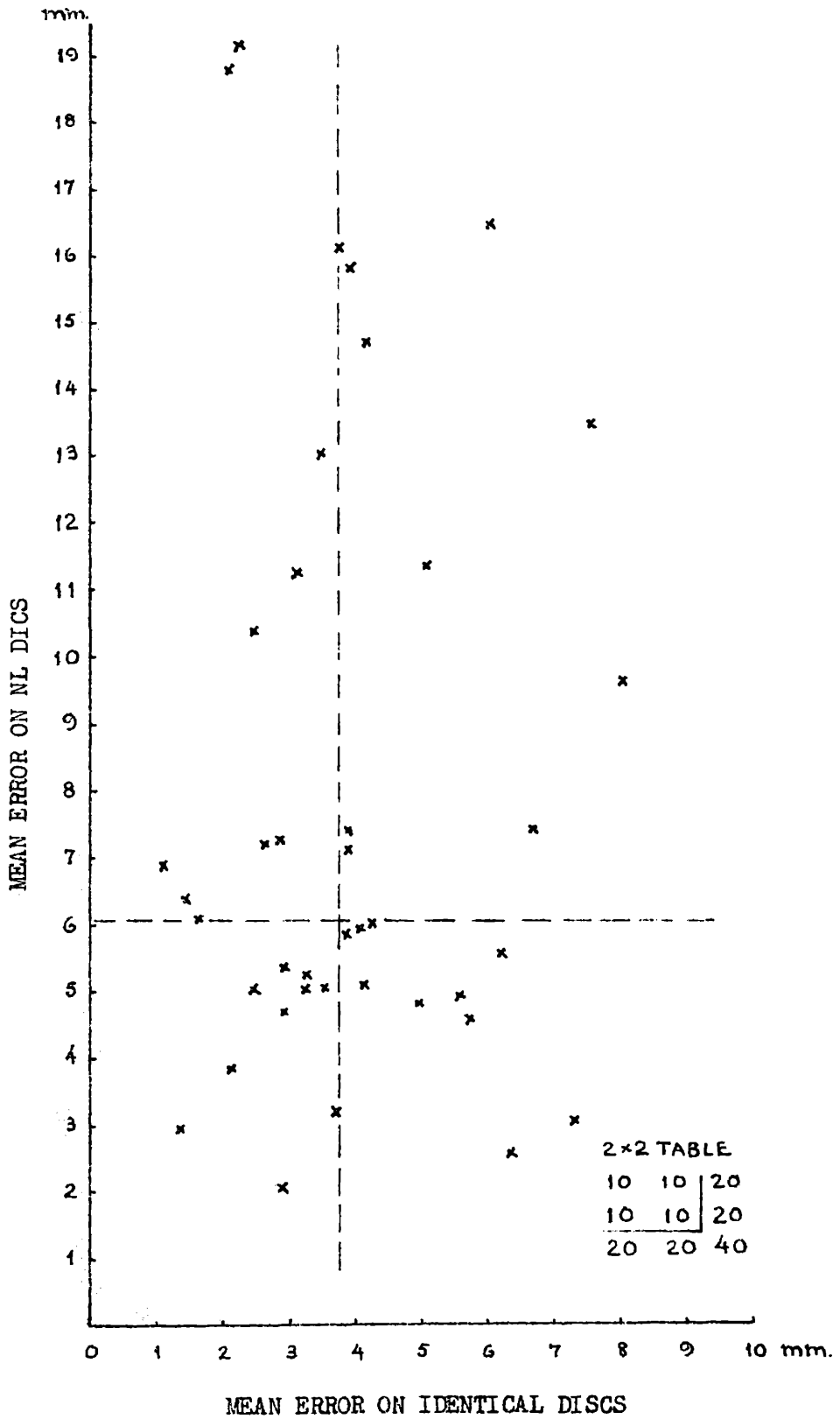


Figure 3. Size-estimation test. Relation of error on identical, projected discs to error on neutrally-loaded (NL) discs.

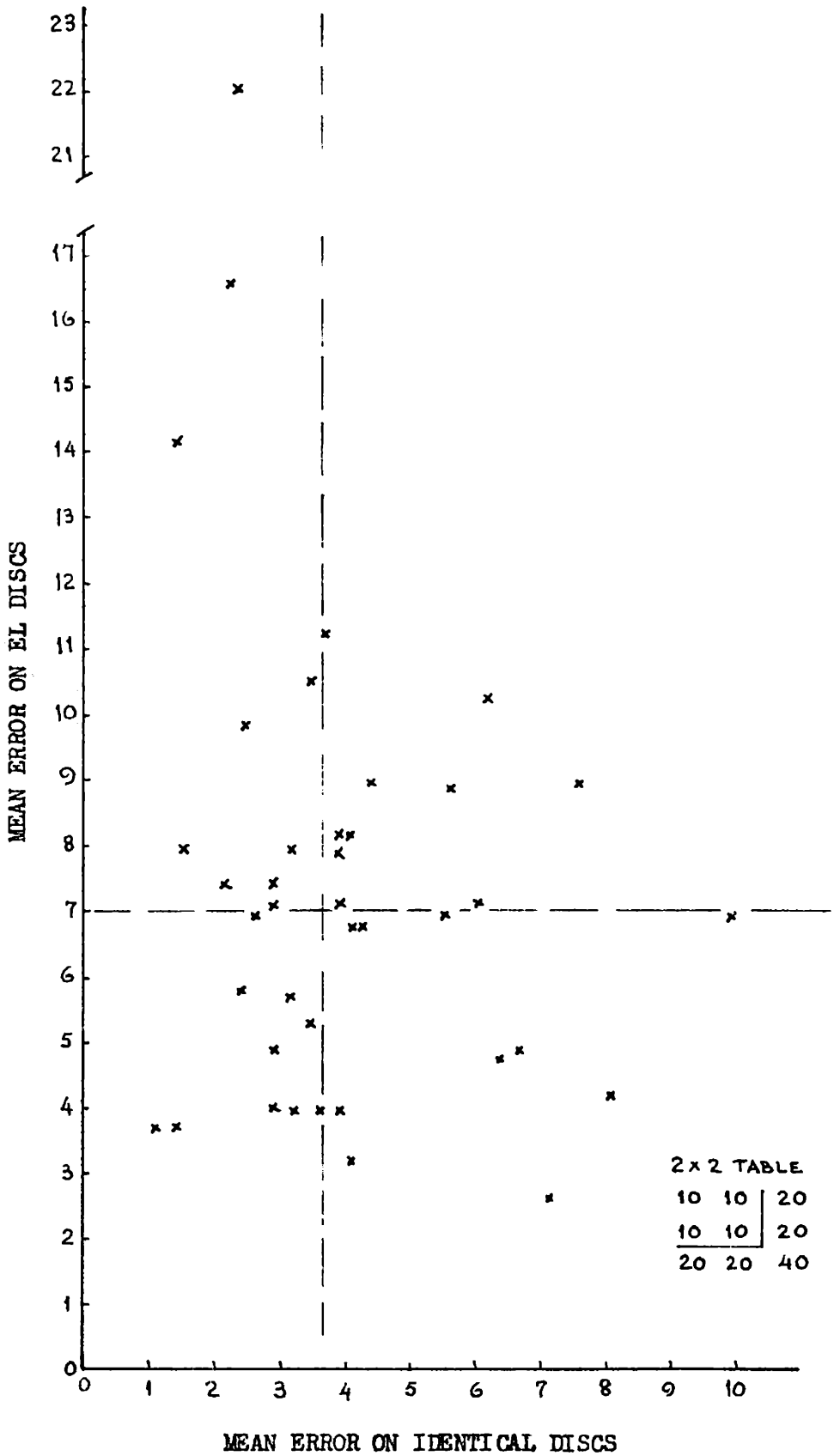


Figure 4. Size-estimation test. Relation of error on identical, projected discs to error on emotionally-loaded (EL) discs.

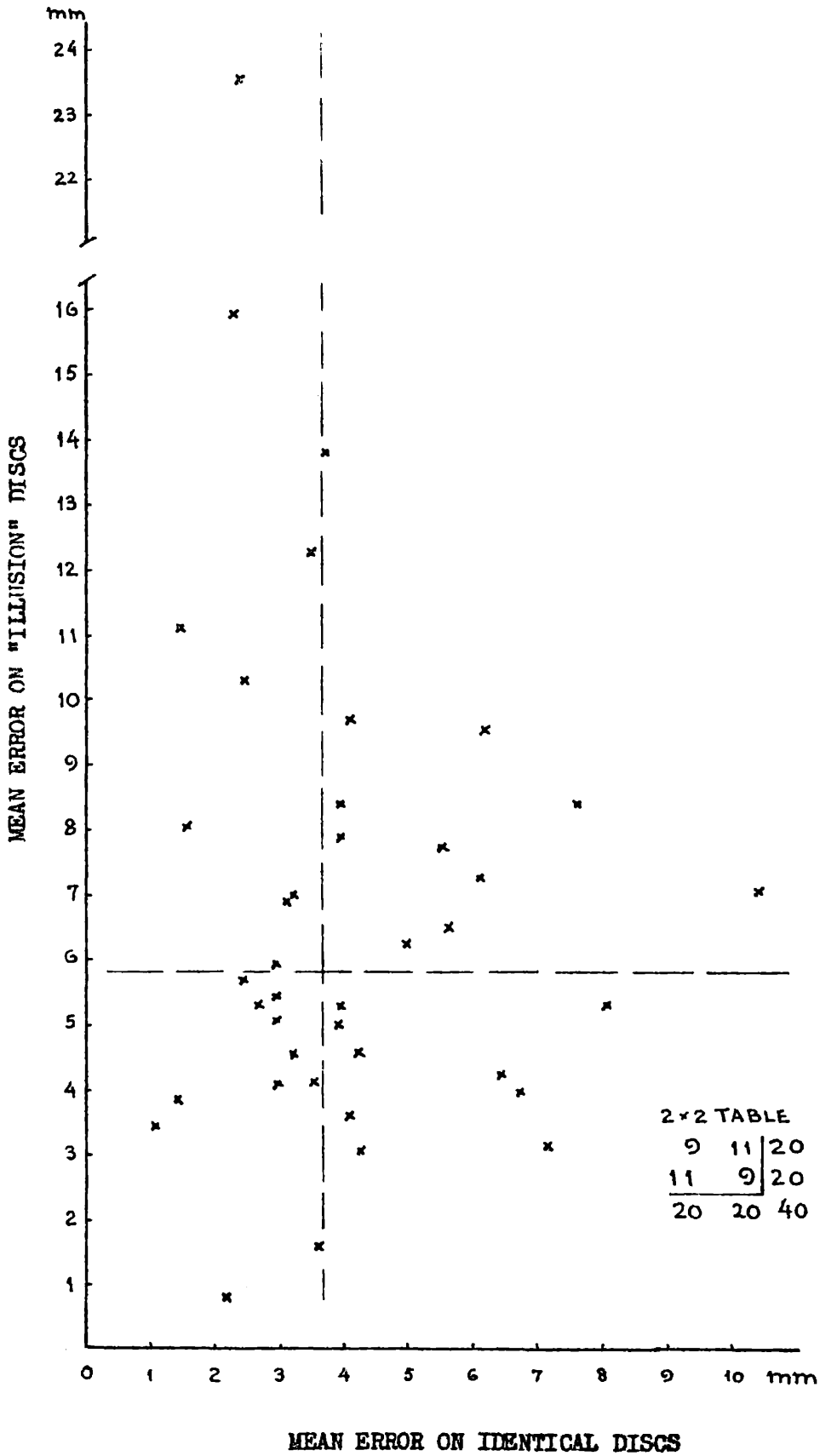


Figure 5. Size-estimation test. Relation of error on identical, projected discs to error on "illusion" discs.

two tables formed by dividing the distributions at the medians show only a chance breakdown. Clearly, then, the individual variation in size-estimation of the hand-held discs is not explainable merely by invoking possible differences in ability to be accurate among our subjects.

We can find support in the data for our contention that emotional stimulation, grafted as it was upon the size-estimation task, can be regarded as merely an additional irrelevancy. Let us compare our subjects in their average errors on the NL and EL discs.

Figure 6 is a scatter diagram plotting each subject's average error on the NL discs against his error on the EL discs. While the scatter of these plots is considerable, the relationship is apparent. The Pearson correlation coefficient computed from these data is $+.61$.[1] When the data are divided along the medians of the two distributions, the two-by-two table thus formed yields a chi-square corrected for continuity of 2.5, which is significant at approximately the .06 level with a one-tail test. Thus we can state with some confidence that the error on the EL discs which, according to current fashion, might be "explained" by the "values and needs" associated particularly with these stimuli, is predictable from a knowledge of the subject's performance on the same task

---

1. With 40 cases, a correlation coefficient of .312 is needed for significance at the .05 level. The effect of extreme cases on product moment correlations is discussed below.

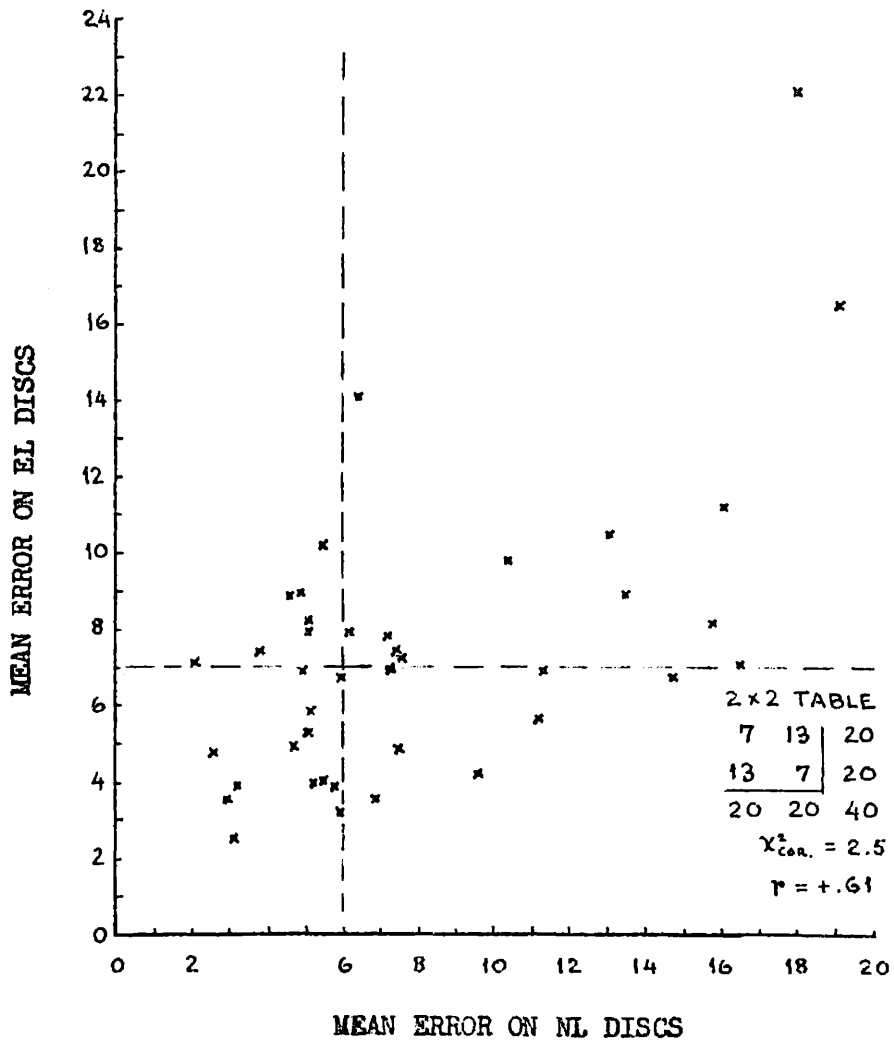


Figure 6. Size-estimation test. Relation of error on neutrally-loaded (NL) discs to error on emotionally-loaded (EL) discs.

when the value and need stimuli are absent. Perhaps more importantly, this finding suggests strongly that we may do better to look for our explanation in the relationship of the subject to the task rather than in the relationship of values or needs to perception.[1,2] Figure 7 plots the relationship between the NL discs and the illusion discs. Again the relationship is apparent, the correlation coefficient ρ .66. The two-by-two table formed by cuts at the medians of the two distributions yields a chi square corrected for continuity of 2.5 which is significant at about the .06 level for a one-tail test. The distributions, however, are highly skewed and a two-by-two table formed by cuts at the means of the two distributions yields a chi square of 3.6 which is significant at about the .03 level with a one-tail test. It is clear from these findings that there is a systematic variation among subjects and consistency within subjects in estimating the size of all three classes of discs as there would have to be if our hypothesis is to stand.

The findings thus far support the contention that people differ in the degree to which they focus on relevancies and ignore irrelevancies, with the result that some are more accurate than

---

1. Even greater consistency is seen in the performances of subjects when the comparison is made on the basis of constant (algebraic) errors rather than total (arithmetic) errors. See pp. 82ff.

2. This is not intended to imply that other needs and values present in the subject are without influence on his performances. The present discussion is limited to the values and needs which may have been injected by the EL stimulus discs.

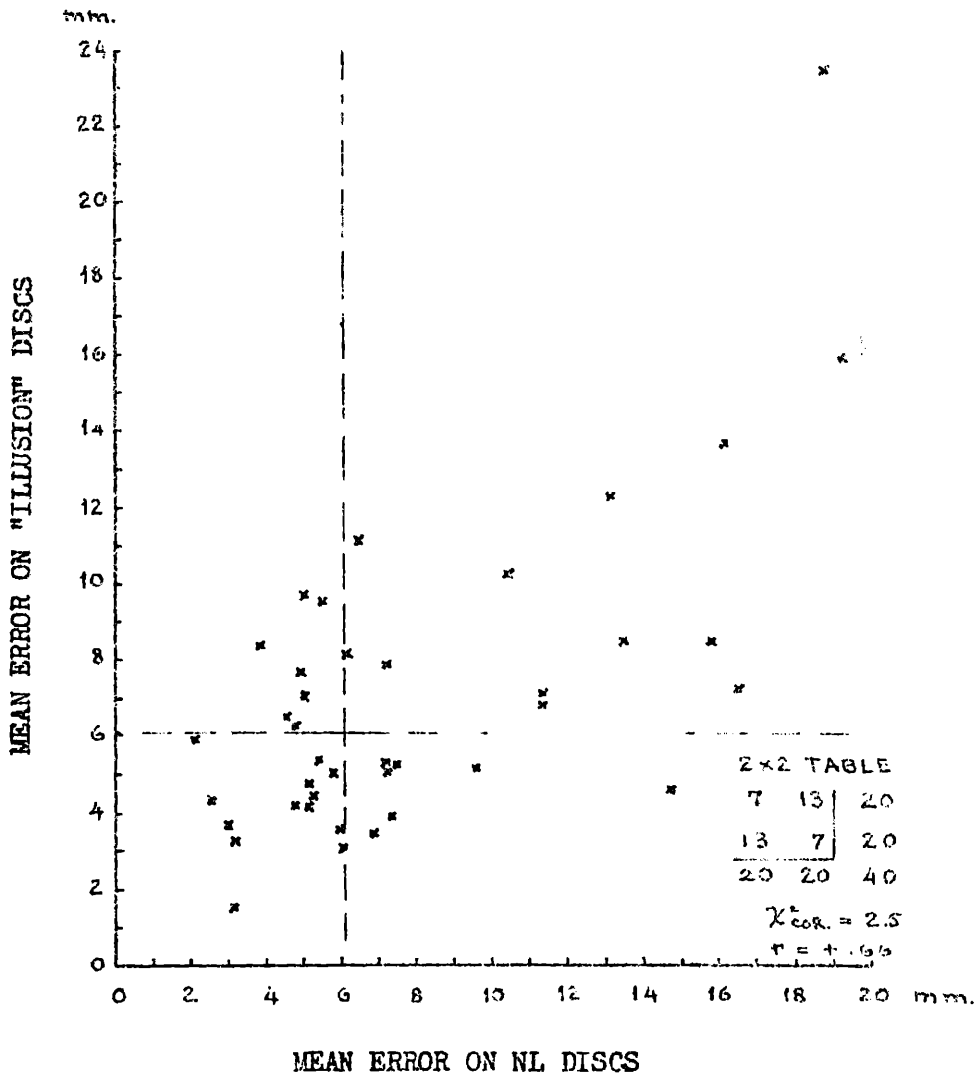


Figure 7. Size-estimation test. Relation of error on neutrally-loaded (NL) discs to error on "illusion" discs.

others in their size-estimations under conditions where various kinds of irrelevant stimulation are present. It has also been shown that ability to ignore irrelevancies like emotion-laden or need or value related pictures is predictable from the subject's performance under conditions when the irrelevancies are of a formal, "neutral" kind without explicit emotional connotations. To demonstrate further that a cognitive attitude is at work here we must show that this readiness to adopt a set of focussing upon irrelevancies has as its opposite face a relative inability to adopt an opposing set--one for a broadened, inclusive, non-critical acceptance when the task demands this latter set. The rationale for the picture sorting test led us to predict that persons whose stressing of the cognitive attitude of focussing netted them low error scores on the size-estimation test should be relatively less able to react to the pictures with any conviction of feeling about them, either of like or of dislike, and should therefore accumulate more ratings of "indifferent" than will those who do not particularly stress this attitude.

Figure 8 is a scatter diagram plotting error in size-estimation for the five ML discs against the number of indifferent ratings in the picture sorting test. While the scatter of the scores is wide, a clear negative relationship is apparent. The scattering reduces the correlation coefficient to -.21. The four-fold table is formed by dividing the size-estimation distribution at its

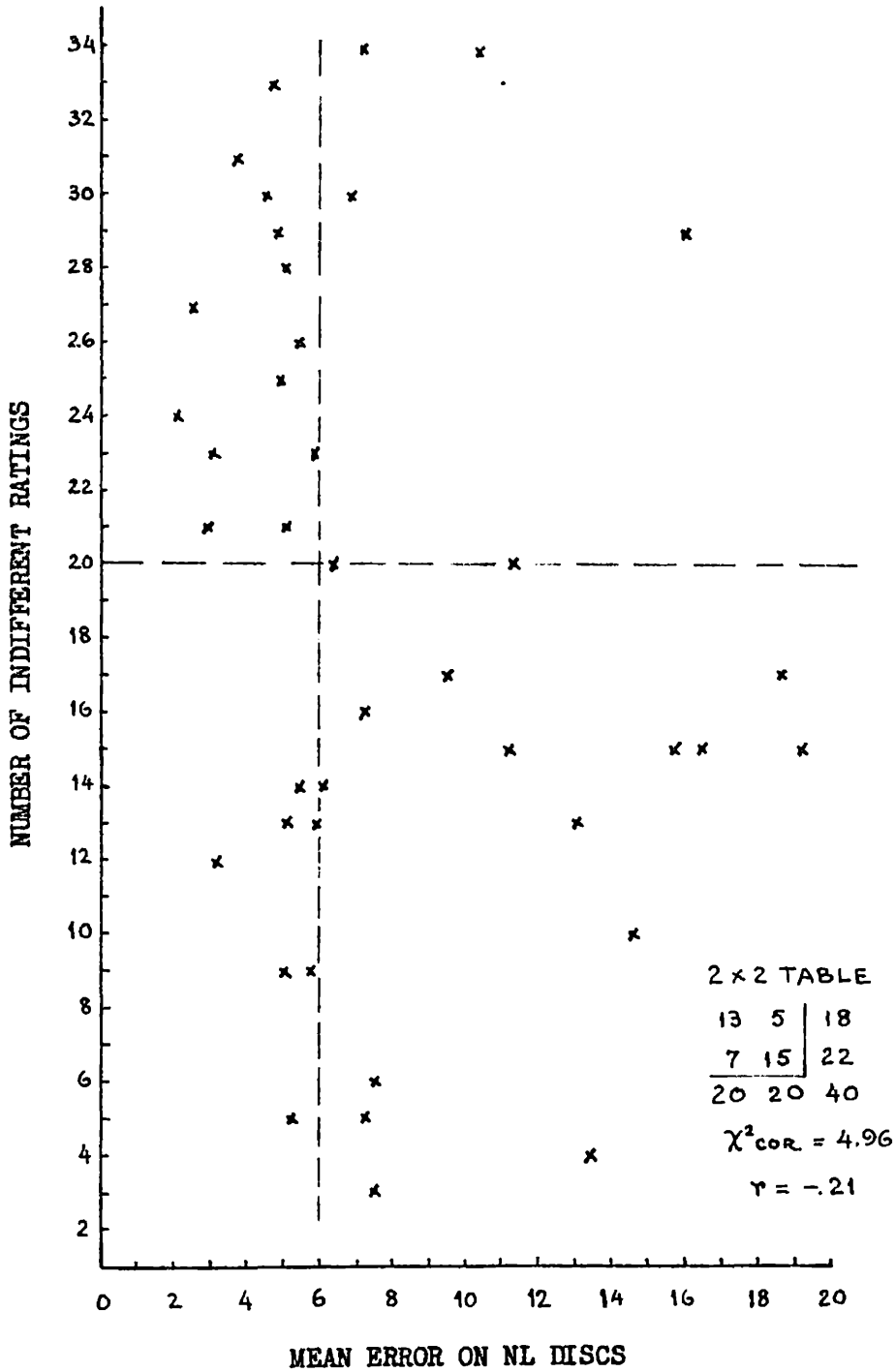


Figure 8. Relation of error in size-estimation of neutrally-loaded (NL) discs to number of indifferent ratings in picture-sorting test.

median and the indifference score distribution at twenty choices.[1] The chi-square corrected for continuity is 4.96, which is significant at about the two per cent level with a one-tail test.

As a further check on the "ability factor," Figure 9 plots the error in size-estimation of the identical, projected discs against the indifference score. This yields an insignificant, negative correlation coefficient of -.16, while the four-fold table yields a chi-square corrected for continuity of zero.

A measure of "weight-size" illusion was obtained by taking the difference between the means of the eight pre-test trials with the light gray and with the heavy gray discs. This did not relate appreciably with any of the other measures used in the investigation.

Our general design in this presentation of results is to offer experimental support for our hypothesized cognitive attitude by checking predictions which span levels of theorizing (e.g., perception and personality). We should expect one thing more of our hypothesized attitude, however: that it be able to predict performance in other perceptual tasks which, like the defining task, size-estimation, require the subject to concentrate for the attainment of accuracy in the face of potentially interfering

---

1. The theoretical expectancy for any one category of a three-category test having sixty items. Of course, the three categories and their scores are not independent of each other; a high indifferent score implies few like and dislike ratings.

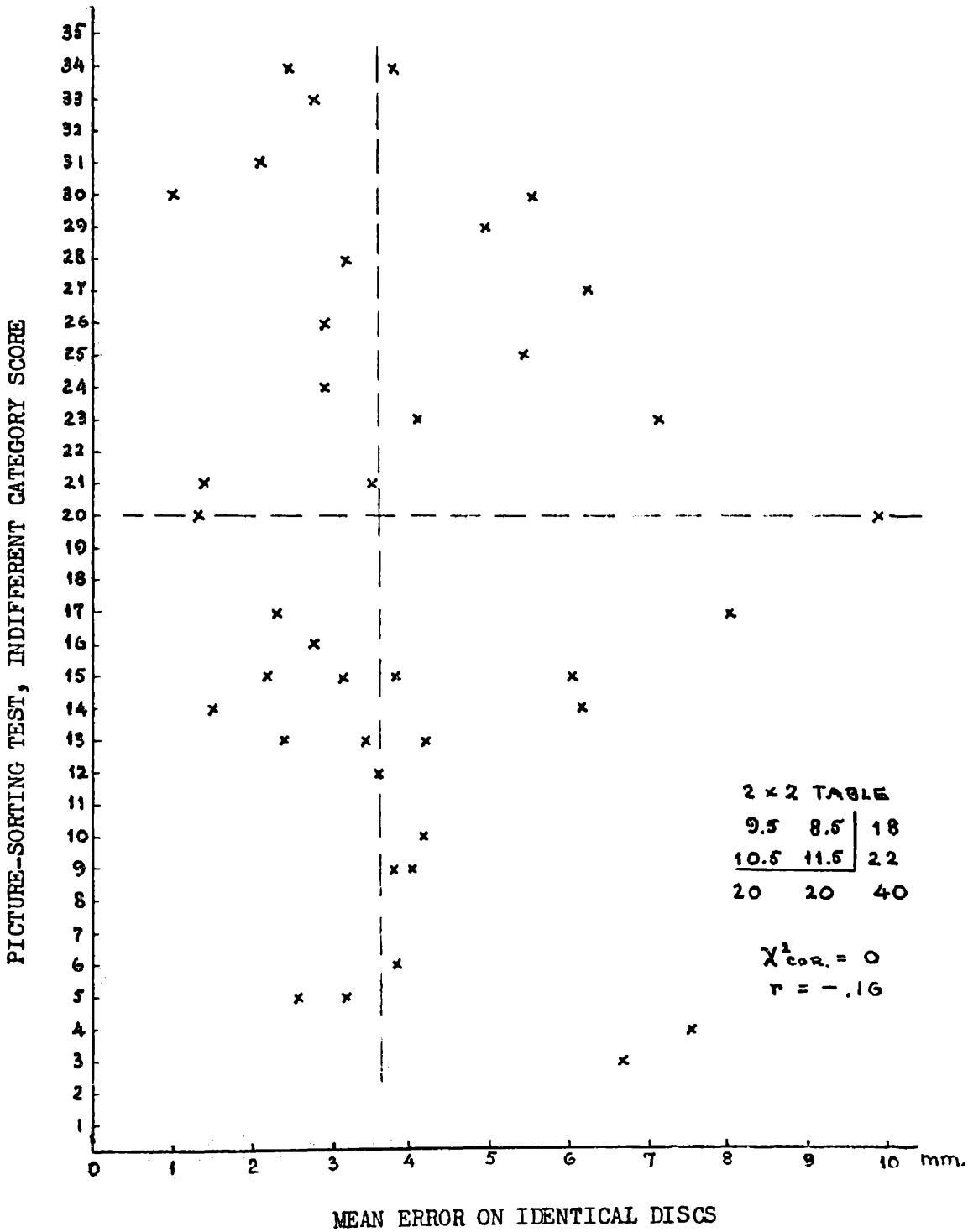


Figure 9. Relation of error in size-estimation of identical, projected discs to number of indifferent ratings in picture-sorting test.

irrelevant stimulation. We originally chose two of the many possible tasks which meet these formal requirements in order to make a beginning effort to study the problem of generality of focussing in perception.

The findings for one of these tests, the color-word test, are plotted against average error on the NL discs in Figure 10. A glance at the distribution of color-word test scores shows that it is a very constricted one compared with that for the size-estimation test. The narrow range of color-word interference scores and the scattering of scores in this distribution sharply lower the correlation between the two distributions. This was computed as ρ .01. If, however, the two distributions are divided in half at their medians, the resulting two-by-two table yields a chi-square corrected for continuity of 2.5, which is significant at the .06 level for a one-tail test. Thus, despite the narrow distribution of color-word test scores, we can see that low errors in size-estimation of NL discs tend to be associated with low interference on the color-word tests.

The findings from the other test, the distance-estimation test, are not presented here because it seems clear that the phenomenology of the distance-estimation task was quite different for different subjects, effectively confounding the meaning of the error in distance-estimation which we were attempting to predict. It is a point for investigation in itself that people experienced

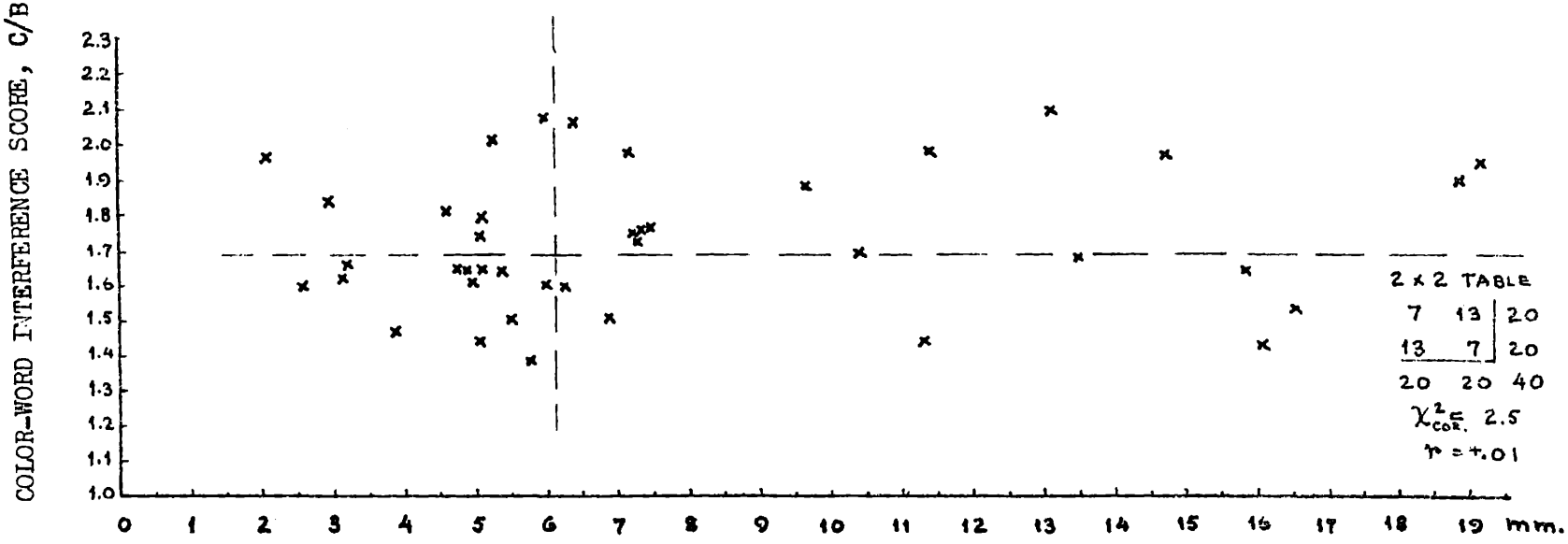


Figure 10. Relation of error in size-estimation of neutrally-loaded (NL) discs to amount of interference in color-word interference test. C/B ratio is time needed to read colors with words interfering to time needed to read colors alone.

this distance-estimation task so differently. Perhaps a still unsuspected personal or cognitive variable was at work here. Our present highly equivocal findings only suggest this possibility but do not give us the opportunity to explore it further. At any rate, it would seem advisable to discount the significance of our findings about distance-estimation and to reserve as an open question the generality of our hypothesized cognitive attitude with respect to the estimation of distance.

Let us pause for a moment to recapitulate our findings.

The picture sorting test, size-estimation test, and color-word interference test have put on trial several of the properties which we earlier derived from the hypothesized cognitive attitude of focussing. We have shown that:

1. The most likely alternative explanation for consistencies in size-estimation, an "ability factor," is not sufficient to account for the findings.

2. Emotional-loading does not of itself produce greater error than other irrelevancies in the field but rather tends to produce less error than other irrelevancies among subjects prone to interference.

3. Error on emotion-laden discs is predictable from error on non-emotion-laden discs.

4. Amount of color-word interference is associated with amount of error in size-estimation.

5. Greater accuracy in the size-estimation test is associated with difficulty in adopting a set of broadened acceptance of stimulation which would allow free access of inner feelings into experience.

Some implications of these, the last especially, have already been touched upon (pp. 16ff). Because of the importance of the picture sorting test to our hypothesis, we will present additional findings from this test in some detail.

CHAPTER V

FURTHER RESULTS AND IMPLICATIONS OF THE PICTURE-SORTING TEST

The test pictures spanned a wide range of content and emotional stimulus-value. It would be interesting to see if pictures of different content and connotation were responded to differently (in terms of indifferent choices) by those subjects who are organized around the cognitive attitude of focussing and those who are not. To this end a kind of item analysis of the test was undertaken. In order to highlight whatever differences might appear between persons presumably at the extremes of the continuum for this attitude, the upper and lower 25 per cents of the HL discs distribution were compared. There were ten subjects in each group.

As a first step those pictures were separated which were rated as indifferent by at least six out of the ten subjects in the "focussing" group and by no more than four out of the "non-focussing" group. Table I lists the pictures which meet this test.

It is noteworthy that, out of the eight pictures in this group seven (i.e., all but number 17) can fairly be said to be highly charged emotionally. This table suggests that the focussers were even less able to respond in terms of their feelings when the pictures to be responded to (or perhaps because the pictures to be responded to) were of an emotionally-exciting kind.

TABLE I

EIGHT PICTURES RATED INDIFFERENT BY AT LEAST 6 OUT OF 10 EXTREME FOCUSSERS AND NO MORE THAN 4 OUT OF 10 EXTREME NON-FOCUSSERS

Picture Number	Description	Focussers (Low Error Group) (N = 10)			Non-Focussers (High Error Group) (N = 10)		
		L	D	I[1]	L	D	I
7.	Photograph of a female nude doing a backbend toward the viewer.	2	3	6	5	3	2
17.	Monochrome lithograph "London Scene".	1	2	7	5	4	1
37.	Photograph of statue of a female nude.	2	1	7	4	3	3
39.	Photograph of a man sobbing uncontrollably.	0	3	7	2	7	1
49.	Photograph of a nude female back on which shadows of iron grill-work are cast.	1	2	7	7	0	3
52.	Dramatic photograph of a hand with an amputated finger, bandaged.	2	2	6	3	5	2
56.	Photograph of a hillside in India with carcasses and skeletons of animals scattered about.	1	3	6	1	8	1
57.	Photograph of a girl's head, screaming in fright.	2	2	6	6	1	3

1. L, D and I refer to the three categories Like, Dislike and Indifferent.

Going a step further, the pictures were sorted into groups of relatively homogeneous content or emotional connotation. Because of the variety of content represented in the pictures, only a few groups of any appreciable size can be selected if they are to be at all homogeneous. Two groups of pictures were selected which can be said to be emotionally charged. One group of 11 contained pictures of pronounced aggressive connotations--another group of 12 had fairly pronounced sexual connotations. A third group of 13 had pictures which, in comparison with those of the other two groups, can be considered rather neutral in emotional tone. Some arbitrariness, of course, is involved in defining the emotional tone of a picture; this is a matter subject to individual interpretation. It is perhaps most arbitrary of all to say that a picture is "neutral", and it must be emphasized that this distinction is meant in a restricted and comparative sense. The pictures in the neutral group were selected on the basis of being (at least to the experimenter) unprovocative. While certainly they are all subject to emotional interpretation, they tend in content and execution to be drab and unexciting.

The mean number of indifferent ratings given to each group of pictures by the ten extreme focussing and ten extreme non-focussing subjects are compared in Table II.

TABLE II

MEAN NUMBERS OF INDIFFERENT RATINGS GIVEN BY TEN FOCUSSING SUBJECTS AND TEN NON-FOCUSSING SUBJECTS TO THREE CATEGORIES OF PICTURES

	Focussers (Low Error Group) (N = 10)	Non-Focussers (High Error Group) (N = 10)	Difference	t	p
Aggressive Pictures (N = 11)	3.18	.73	2.45	3.90	<.05
Sexual Pictures (N = 12)	5.50	3.08	2.42	3.91	<.05
Neutral Pictures (N = 13)	4.70	3.46	1.24	1.59	----

The focussing group can be seen to be highest in indifference choices for each of the categories of pictures. The difference between the two groups seems greatest for the two categories of emotionally charged pictures. These findings tend to support the earlier suggestion that focussing subjects may have especial difficulty responding on the basis of their feelings when the stimulus material is emotionally provocative.

It is obvious from a glance at Table II that we are far from having unanimity of indifference in the focussing group. The non-focussing group is more homogeneous in this respect. None of these three categories of pictures is as efficient in discriminating between the two extreme groups of subjects as is the total series of 60 pictures. The mean number of indifference choices on the whole test for the extreme focussing group is 25.5 and for the non-focussing group, 15.3, these means are on opposite sides of the theoretically expected figure of 20 choices. The difference between them is significant at better than the .01 level. The response times for the picture-sorting test were also analyzed. The pattern of sortings and response times are summarized in Table III.

Table III shows that there is very little difference, on the whole, between the response times for the three response categories. The finding of a slightly longer response time for the indifferent pictures seems reasonable, but the difference

TABLE III

MEAN NUMBER OF SORTINGS AND RESPONSE TIMES FOR PICTURE-SORTING TEST

		Sortings	Response Times (Seconds)	
		Mean	Mean	SD
All Subjects N = 40	Liked Pictures	21.2	3.4	1.48
	Disliked Pictures	20.8	3.4	1.36
	Indifferent Pictures	18.7	3.7	1.54
	All Pictures		3.5	1.26
Focussing Subjects N = 10	Indifferent Pictures	25.5	3.3	1.57
	All Pictures		3.3	1.52
Non-Focussing Subjects N = 10	Indifferent Pictures	15.3	4.0	1.50
	All Pictures		3.8	1.33

between it and the other times is not significant. The focussing subjects appear to have shorter response times for the total test, and especially for their indifferent responses, than the non-focussing subjects, but these differences are not significant. A glance at the raw data (Table VIII) shows the wide range of response times. For the total test the means response times range from 1.48 seconds to 6.32 seconds. The subjects, of course, were specifically instructed to work at their most comfortable pace.

The inquiry conducted after the picture-sorting test was quite informative in the case of some subjects and rather less so for others. Not many subjects were able to verbalize clearly the experiences they had during this test. It is our impression that the fewer the indifferent responses and the more comfortable the task set to respond on the basis of the first feeling aroused, the less could the experience be verbalized (although there were exceptions to this). It seemed as if for such subjects the task and their responses were self-evident. A typical comment by such a subject (#36, five indifferent responses) was "generally, if I like or dislike something it doesn't take me long to decide it. I'm that way with most things--what I like, I like...." For contrast, here is a comment by another subject (#16, 26 indifferent responses) "I had trouble deciding which left me indifferent and which I disliked... Those which I liked were for various and sundry reasons...I tried

to evaluate the photos at first...the first two I liked would be indifferent if I did it again. They're not as good as I thought they were at first."

The latter comment clearly indicates that the task set, to free oneself to respond to one's feelings, as required by the instructions for the test, was never established by this subject, whose approach to the pictures was evaluative and critical.

The inquiries also warn us about how vulnerable the indifferent category score is. Several of our subjects--particularly those who had difficulty in adopting the required task-set--re-defined the task for themselves and in doing so gave spuriously low indifferent scores. An example is subject 27 (3 indifferent responses) who stated, "Not many gave me a real feeling...I tried to keep them out of the middle. I felt I'd like to decide one way or the other." Such comments tell us how important it is to make sure that the subject is actually operating under the task set which the instructions attempt to establish. They warn us further not to take a subject's responses at face value in such a test as this without thorough inquiry into his experience.

CHAPTER VI

QUANTITATIVE RESULTS: PERSONAL INVENTORY

We have shown that the picture sorting test data support our hypothesis of a cognitive attitude that favors the formation of sets for narrowed and focussed attention and makes difficult the adoption of antithetical sets. In the course of this demonstration we proposed (and gave some evidence to support) linking emotional stimulation with other task-irrelevant stimulation. Again, we must emphasize that from a logical viewpoint emotional stimulation and inner feelings need not be thought of in this way, except when the task explicitly or implicitly defines them so. This was the case for the size-estimation test. The picture sorting test, however, specifically required an antithetical set. In it emotional stimuli and inner feelings were to be allowed to guide behavior. The differences which emerged among our subjects in this task not only support our thinking about the role of focussing, but suggest further that our subjects also differ widely in their emotional life in general. If this suggestion could be verified it would add weight to our argument that focussing, as a cognitive attitude, could be regarded as a principle of personality organization. It would help us to designate at least one aspect of personality organization to which focussing is relevant.

The inclusion in the test battery of a personal inventory with items aimed at the ways people experience, express, and control emotions makes it possible for us to relate the findings

from which we infer support for the existence of a cognitive attitude of focussing to this more general aspect of personality functioning. The 46 inventory items were keyed true and false from the viewpoint of how an "ideal person" who tends to be completely free in experiencing and expressing emotions, and who feels little need for suppressive control of emotions should answer them.

The decision to key each item only as true or false (considering a rating of one through three as true, and a rating of five through seven as false, with ratings of four not counted) was made after observing various subjects rate the inventory and after inspecting all the completed inventories. It was obvious that subjects used the inventory rating scale in vastly different ways. Some obviously felt constrained to rate all items either one or seven, while others hovered closely about the mid-point in their ratings. While such varying uses of the inventory scales would in themselves provide an interesting subject for investigation, in the present context they make unwise a too literal acceptance of the numerical ratings. Thus, only the fact that a rating was above four or under four was considered. Each subject therefore received a score which reflected the number of agreements between his ratings of the items and the previously established key.

The scores ranged from 12 to 37 agreements with the key. The expected frequency of agreements with the key for a 46 item

test with a two-category response choice is 23.[1] The mean score was 25.7; the median was 25. The relative positions of the mean and the median, as well as the location of both above the expected number of agreements indicate that either our scale is biased mildly or that our subjects on the whole are, or say they are, emotionally free.

Figure 11 is a scatter diagram plotting the number of inventory items answered according to the key against the error in size-estimation of the NL discs. The prediction based on the properties of our hypothesized cognitive attitude would be that those subjects in whom the focussing attitude is stressed should describe themselves as relatively unemotional, as relatively distant and without conviction in their emotional experience, as preferring a relatively narrow range of emotional experience, and as favoring suppressive control over their emotions. We should therefore expect a positive relationship between amount of error in size-estimation (our defining score for focussing) and the inventory score, i.e., our focussing subjects should have lower inventory scores than our non-focussing subjects.

---

1. Although three categories were actually provided--true, false, and neither true nor false--ratings of four (neither true nor false) were relatively infrequent among our subjects. Our 10 focussing subjects have an average number of "4" ratings of 4.9 while the non-focussing have an average number of "4" ratings of 2.5. It seems appropriate, therefore, to consider this as essentially a two-category test, ignoring for this purpose the few "neither true nor false" responses.

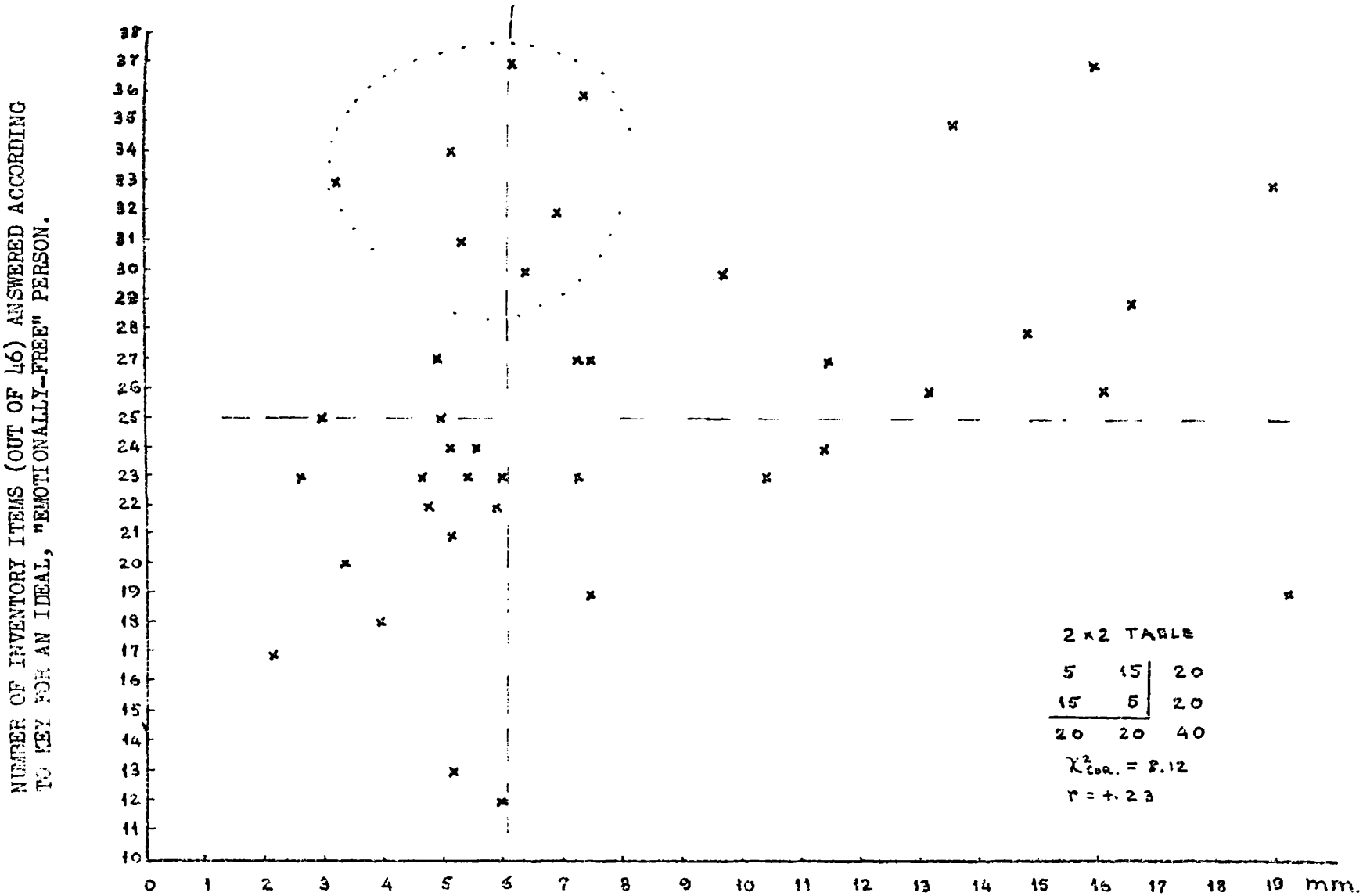


Figure 11. Relation of error in size-estimation of neutrally loaded discs to number of inventory items (out of 46) answered according to the key for an ideal, "emotionally-free" person. The seven plots encircled by the dotted line are discussed in the text.

The relationship between the variables plotted on the scatter diagram is immediately apparent although again there is considerable scattering of scores. The correlation coefficient is ρ .23, which does not reach significance. The two-by-two table formed by dividing the two distributions at their medians yields a chi-square corrected for continuity of 8.12 which is significant for a one-tail test beyond the .005 level. The mean inventory score for our 10 focussers, 23.3 as against 28.5 for the 10 non-focussers. The difference of 5.2 yields a t of 2.270, which is significant at better than the .03 level for a one-tail test.

The scattering of scores, which reduces the correlation coefficient, appears to be localised largely in a cluster of seven plots. These are encircled on the scatter diagram. An examination of these scores indicates that four out of the seven were from subjects who typically under-estimated the size of discs. Since the distribution of errors in the size-estimation of the unloaded discs is quite markedly skewed positively this finding was further investigated. Figure 12 is a scatter diagram in which the inventory score is plotted against the subjects' constant errors (observing signs) on the NL discs. Instead of one linear relationship, as Figure 11 shows, the plots now seem to fall along two regression lines, with the inventory score increasing with increases in negative as well as in positive error. The two correlation coefficients are ρ .34 and - .44, both of which approach significance at the .05 level. The correlation coefficient for all of the cases, not

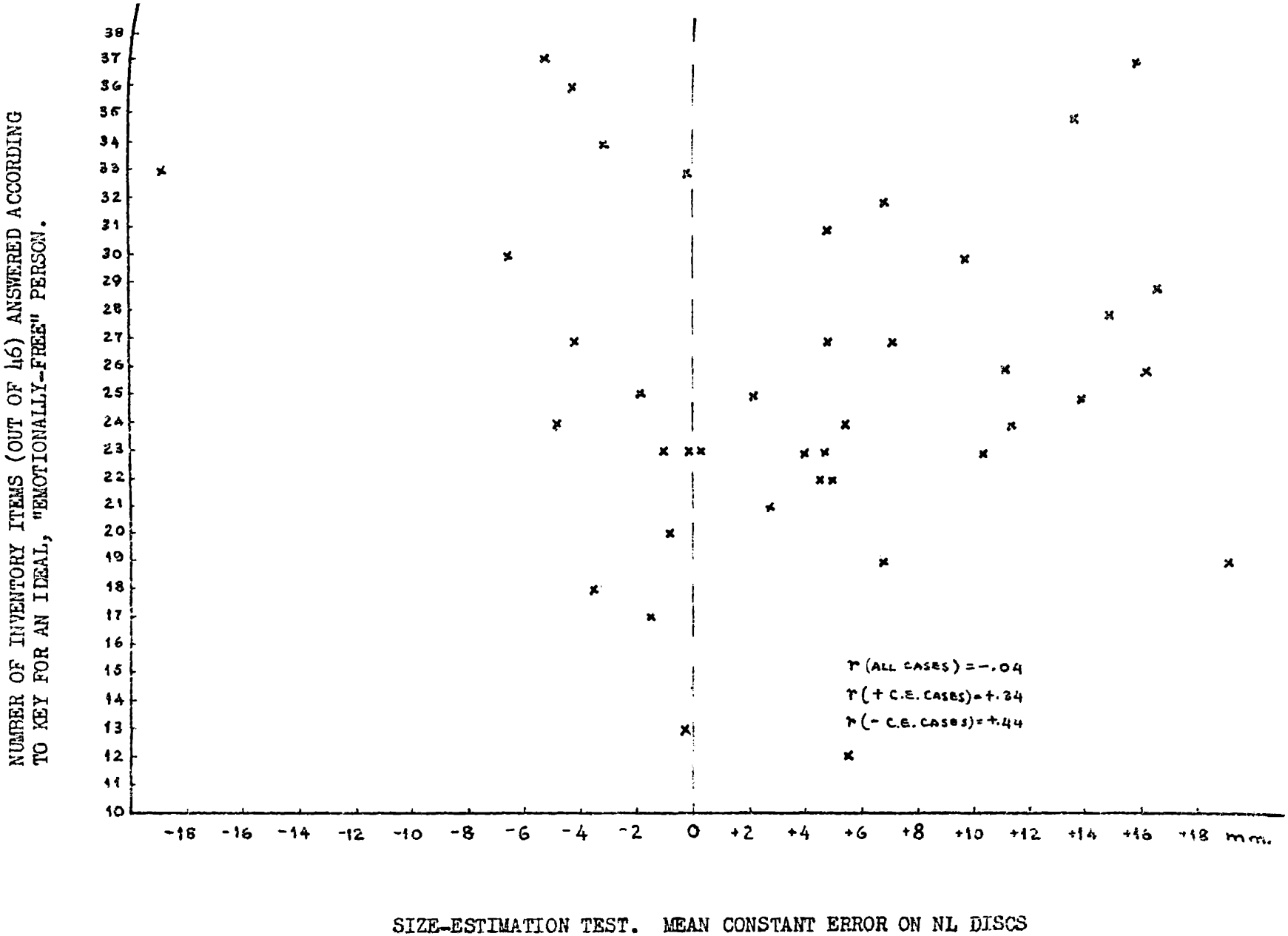


Figure 12. Relation of constant error (observing signs) in size-estimation of neutrally-loaded (NL) discs to number of inventory items (out of 46) answered according to the key for an ideal, "emotionally-free" person.

separating positive from negative error, is - .04. Evidently, for our purposes high positive error and high negative error are equivalent--the amount of error rather than its direction is related to the cognitive attitude we have hypothesized. This is not to say that direction of error may not have consequences of its own which are not tapped by this study, but merely that amount, rather than direction of error, predicts the personality attributes which we have derived from our hypothesized cognitive attitude.

In Figure 12, it is evident that the two regression lines for the positive error distribution and the negative error distribution do not have the same slope. The greater slope for the negative error distribution accounts for the clustering of the deviant plots in Figure 11. We can offer the suggestion that a probable reason for the difference in slopes (which is related, also, to the marked positive skewing of the constant-error distribution) is that the size-estimation task with hand-held discs makes for a systematic bias toward over-estimation. We can venture that this comes about because the hand-held disc is held about two inches nearer the subject than the plane of the variable, projected disc. This provides, in effect, a miniature "size-constancy" situation in which a more distant variable disc is to be adjusted to the size of a nearer standard. Such a situation on a larger scale typically yields judgments which are compromises between the "law of size constancy" and the "law of the visual angle." Thus, the expected judgment, with respect to the <u>true</u>

object size, is an over-estimation. Those subjects, therefore, who tend to under-estimate (for whatever reason) do so against the "pull" of the situation. It seems reasonable to suppose further that the situational bias, in effect, cancels out some of their tendency toward under-estimation and, from the viewpoint of total errors, lowers their error score. Such a hypothetical process would account for a steeper slope for under-estimation.

As might have been expected from the relationships demonstrated above, the inventory score is negatively related to the picture-sorting test indifference score. Figure 13 is a scatter diagram plotting this relationship. It yields a correlation of -.22 which, though in the proper direction, does not reach significance. A two-by-two table dividing the inventory distribution at the median and the picture sorting test distribution at its theoretical mid-point yields a chi-square corrected for continuity of 2.64, which is significant at approximately the .06 level for a one-tail test.

Thus far we have used our inventory only in terms of the number of agreements with our predetermined key. We have been able to show that focussing, as defined by accuracy on the size-estimation test and further delineated by the picture sorting test can be used to predict a global quality of emotional experience reflected in the cluster of 46 items as a whole. An item analysis should sharpen our conception of the quality of emotional experiences which are predictable.

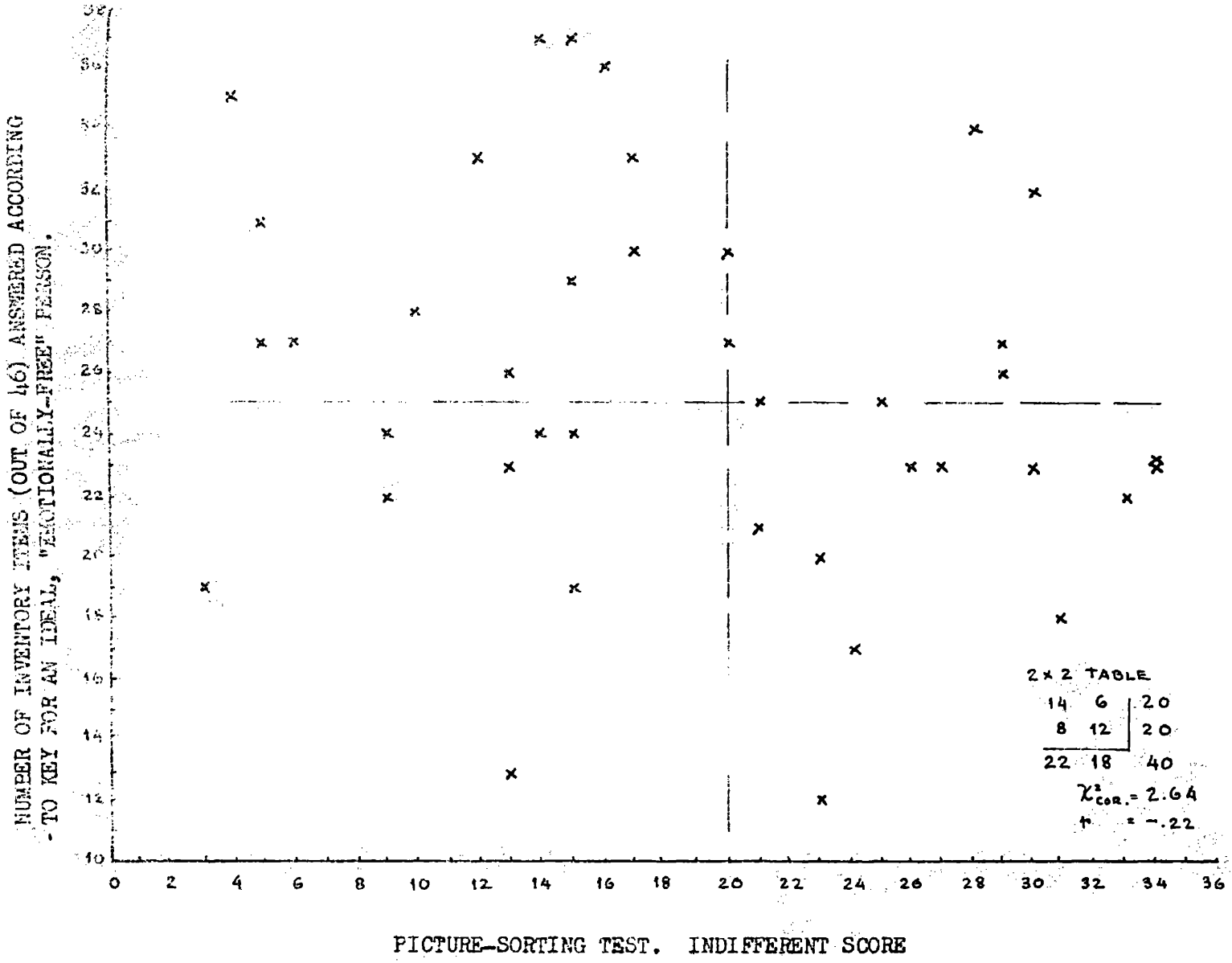


Figure 13. Relation of number of indifferent ratings in picture-sorting test to number of inventory items (out of 46) answered according to the key for an ideal, "emotionally-free" person.

CHAPTER VII

ITEM ANALYSIS OF THE PERSONAL INVENTORY

Our purpose is to highlight the items of the inventory which contributed most to the relationships between the inventory score and the defining task, size-estimation. In order to do so, only the responses of the ten subjects lowest in error (focussers) and the ten highest in error (non-focussers) in the size estimation of the NL discs will be compared.

An examination of the inventory responses for the focussing and non-focussing groups immediately makes clear that while the responses to the cluster of items as a whole clearly differentiates the groups, less than half of the items discriminate individually between the two groups with any effectiveness. To increase our understanding of the differences between the two groups in terms of these items, those which discriminate most clearly and those which discriminate relatively less clearly will be presented separately. The item analyses are summarized below in Tables IV and V. The items selected for these tables were those to which the two groups responded in accordance with the key set up before the investigation. For Table IV only those items were chosen upon which the two groups clearly diverged in their response tendencies, i.e., six or more in each group of ten responded in the direction set up by the key. In Table V are those items which discriminated between the two groups in accordance with the key for each item, but not as sharply within one or the other group as did the items

TABLE IV

INVENTORY ITEMS WHICH CLEARLY DISCRIMINATED BETWEEN THE FOCUSSING AND NON-FOCUSSING GROUPS IN ACCORDANCE WITH THE KEY

No.	Item	Focussers (Low Error Group) (N = 10) T	O	F[1]	Non-Focussers (High Error Group) (N = 10) T	O	F
10.	Sometimes I talk myself into feeling the way I think I should.	6	3	1	4	0	6
56.	Sometimes I get so emotionally involved in a question that I can't think straight.	3	0	7	6	0	4
60.	My spirits depend very much on my surroundings, a gloomy room makes me feel that way too.	3	1	6	8	0	2
96.	At the movies I identify myself easily with the characters on the screen and feel almost as if I were going through their adventures.	3	1	6	7	0	3
102.	At different times I seem to love and hate the same people.	2	2	6	6	2	2
126.	I am easily moved to tears by a sad part in a movie.	3	0	7	9	0	1
132.	My feelings are easily hurt by ridicule or by the slighting remarks of others.	3	0	7	8	0	2

1. T, O and F in this and the following tables refer to True (ratings of 1-3), neither True nor False (rating of 4), and False (ratings of 5-7). The response category called for by the key is shown by underlining the appropriate columns.

TABLE V

INVENTORY ITEMS WHICH DISCRIMINATED RATHER LESS SHARPLY BETWEEN THE FOCUSSING AND NON-FOCUSSING GROUPS THAN DID THE ITEMS IN TABLE IV

		Focussers (Low Error Group) (N = 10)			Non-Focussers (High Error Group) (N = 10)		
No.	Item	T	O	F	T	O	F
23.	I can get considerable relief for my feelings out of a good cry.	5	0	5	8	0	2
41.	I consider myself a rather unemotional person.	3	3	4	0	0	10
53.	I find that I tend to be guided more by my feelings about things than what I know about them.	5	1	4	9	0	1
86.	I have a rather sentimental attitude toward most things in life.	5	2	3	10	0	0
95.	Giving way to one's emotions seems to me a sign of weakness.	3	3	4	1	0	9
118.	Sometimes I talk myself out of having feelings.	3	4	3	2	0	8
130.	I pride myself on my self-control.	5	1	4	1	2	7
135.	I'm inclined to "let myself go" emotionally.	1	1	8	5	2	3

of Table IV. On these items one group showed a strong tendency in the predicted direction, while the other group showed only a weak tendency, i.e., fewer than five of the ten subjects answered in the predicted direction. In no case did either group show a strong tendency opposing the prediction.

Taken at face value the results for these items suggest that the difference between the two groups has to do with the experiencing of feelings and the recognition of their importance. If we can let the majority speak for the whole on these items the non-focussers clearly describe themselves as "emotional" people who are aware of their feelings, who relate themselves to others freely, and who easily become emotionally involved with others. The focussers, on the other hand, describe themselves largely in negative terms on these items by indicating that they do not apply to them. It is interesting that only one out of the seven items (#10) deals with a positive experience of the focussers. This points at a finding which Table V will make clearer, that our inventory has succeeded far better in capturing the emotional experiences of non-focussers than of focussers. Perhaps it is not surprising, in view of our hypotheses about the focussers playing down of affective processes in favor of "verifiable experience" that their emotional experiences should be rather elusive.

Although four out of the eight items in Table V are aimed at the experiences which were hypothesized as characterizing focussers,[1] the distinction between focussers and non-focussers on these items are due to the almost unanimous rejection of them by the non-focussers. The focussers as a group do not really commit themselves on these items. They take their only strong stand in rejecting item number 135 which states "I am inclined to let myself go emotionally". To reiterate, the non-focussers emerge as a much more clearly defined group in terms of their self-ratings on the inventory. The focussers establish themselves as quite different from the non-focussers, but tend not to commit themselves (though, with one noticeable exception, item 10) to any positive qualities of emotional experience of their own.[2]

It is also clear that for the most part the non-focussers show far fewer instances of subjects answering neither true nor false to these items. Combining the items of Tables IV and V for this purpose, we find only six instances in the non-focussing group of subjects using the ratings "neither true nor false" for

---

1. Items 41, 95, 118 and 130.

2. This comparison is limited to those items which discriminated between the groups in accordance with the key. There are a number of items which do not discriminate and on which the focussers indicate somewhat greater involvement with feelings. This could be inferred from the findings that the mean inventory score for the focussers is 23.3 and the mean of the non-focussers is 28.5. The focussers are thus slightly above the theoretical mid-point (23) for the scale. We see therefore that with respect at least to this present sample of subjects the inventory is biased in the direction of describing people as emotionally free.

TABLE VI

INVENTORY ITEMS WHICH DISCRIMINATED BETWEEN THE FOCUSSING AND NON-FOCUSSING GROUPS AND CONTRADICT THE KEY

No.	Item	Focussers (Low Error Group) (N = 10) T	O	F	Non-Focussers (High Error Group) (N = 10) T	O	F
44.	I'm more the "happy-go-lucky" type than a moody type of person.	5	4	1	3	2	5
103.	I sometimes wish I could feel as deeply about things as other people seem to.	3	1	6	6	3	1

their answers as opposed to 26 instances in the focussing group. It seems a fair inference, upon looking at the responses to all 46 items, that the non-focussing subjects, as a group, had much less difficulty in making up their minds one way or the other about these items than did the focussing subjects. It would seem possible to attribute the unclear emotional status of the focussers entirely to the crudeness or bias of the inventory. Indeed this objection can hardly be ruled out with the data in hand. But the evidence is clear enough that on items which the non-focussers have little difficulty in accepting or rejecting, the focussers tend to hedge. It does not seem an implausible inference that these subjects are, as a group, simply not sure about this area of experience. Such an inference would fit easily with our hypothesis of poor communication between the focussers and their emotional processes. It also seems consistent with their larger number of indifferent choices on the picture sorting test.

Thus far we have looked only at the items which discriminate in accordance with our key. To round out the picture we must look also at those items which discriminate in the opposite direction. Of the 46 items only two were rated by the two groups in such a way as to contradict clearly the hypothesis made about them.[1] These items are shown in Table VI above.

---

1. We do not include here the twenty-nine items which either did not discriminate at all between the groups or where the differences in response tendencies between the groups were so slight as to make individual attention to the items unjustifiable.

Aided by hindsight, we may wonder why item 44 was included in the cluster of feeling items. The writer's best guess is that it stemmed from his notion at that time that persons who are more freely in communication with their feelings and who exert less suppressive control over emotions would thereby be "happier" than those who did the opposite. A little reflection, however, indicates that this need hardly be true. Also, "moody" is a term which could describe a person with strong feelings while "happy-go-lucky" could be taken to mean "carefree" in the sense of not feeling one's troubles much. Answered as it was, the item does not seem to contradict either the letter or the general spirit conveyed by the cluster of items which discriminated in accordance with the key (Tables IV and V). In itself, it does not challenge any of the hypotheses implied in the key nor any of the other items taken individually. Item 103 offers a somewhat different problem for explanation. In part it, too, appears based upon a notion of the writer which, on afterthought, seems open to question. The point of the item was the writer's expectation that those subjects who would have difficulty in recognizing their feelings or who had little conviction in them would wish to be different, to be "freer," in terms of the writer's value-system. Upon reflection, we may wonder why this would need be so.

There is no reason why our focussing subjects should necessarily experience their modes of dealing with emotions as "a difficulty". These speculations are supported by the fact that

item 103 is the only item of the 46 which is couched in terms of "I wish." All of the others call only for a description of experience. Perhaps it is not surprising, then, that it is our non-focussing group, those for whom we hypothesized greater freedom in their handling of feelings and emotions, who wish to feel even more intensely than they do and who set a premium upon this kind of experience.

To sum up the contribution of the inventory data: Both the more formal link to our defining task (size-estimation), via the key and inventory scores, and the examination of items which discriminate between the two groups support the hypotheses about the cognitive attitude of focussing which led us, in the first place, to use the inventory. It seems quite clear that the focussers behave toward their emotional processes as they did toward irrelevancies in the field of the size-estimation test.

CHAPTER VIII

CONSISTENCIES IN DIRECTION AS WELL AS AMOUNT OF ERROR IN SIZE-ESTIMATION

Throughout this thesis we have used amount of error in size-estimation of the NL discs as a measure reflecting the degree to which our subjects stress the cognitive attitude of focussing. While our cognitive attitude has been linked operationally to a measure of amount of error and our interests turn almost entirely upon it, it would be hard to overlook the fact that in much of our data the subjects show impressive consistencies in the direction as well as in the amount of their errors.

Figure 14, for example, plots the relationship between the constant errors for the NL discs against the constant errors for the EL discs. The relationship is apparent and the correlation coefficient of ρ .93 speaks for its strength. This finding confirms a suggestion made in an earlier paper (46) that for many subjects such consistencies might be the rule. It casts still more doubt upon "accentuation" as an explanatory principle for over-estimation in the presence of imposed value- or need-stimulation. Obviously, if subjects who over-estimate emotionally-laden discs also tend to over-estimate non-emotionally-laden discs to the extent that this correlation indicates, then we need hardly seek any special explanation for the one case of over-estimation alone.

Before going further to see how well the constant errors on this task relate to the other tasks of this investigation, it

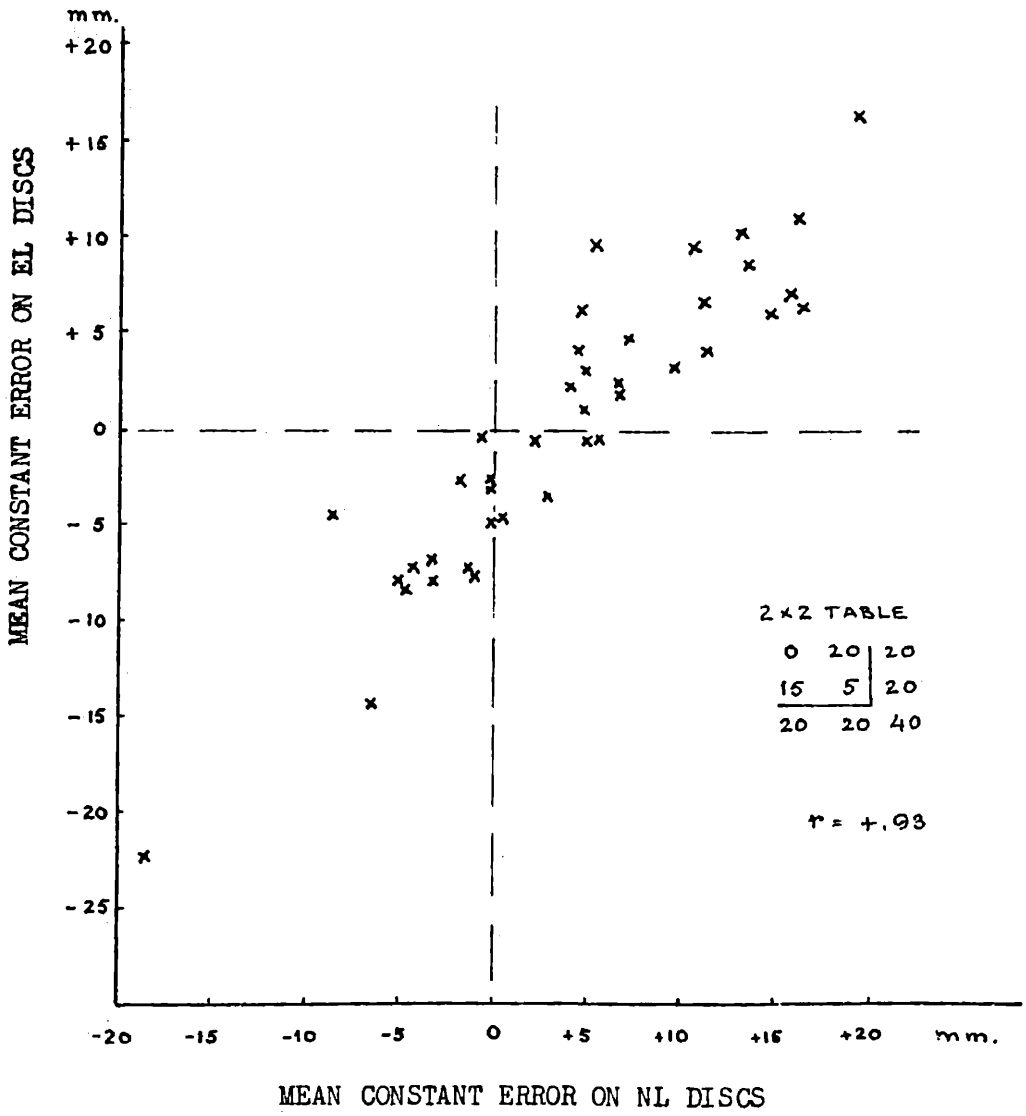


Figure 14. Size-estimation test. Relation of constant-error on neutrally-loaded (NL) discs to constant-error on emotionally-loaded (EL) discs.

would be well to look at the relationship between the total error measure which has been used throughout this study and the constant error measure to which we have just turned our attention. Figure 15 plots constant errors against the total errors for the group of NL discs. The lines which divide the upper and lower halves of the graph at a 45 degree angle indicate where each plot should fall if all twenty trials on which it was based resulted in errors in a single direction. If a subject has over-estimated or under-estimated uniformly his plot will be on that line. To the extent that a subject's errors included over-estimations as well as under-estimations, his plot will deviate from the line. The proportionate distance along the vertical axis from a plot to either line indicates the proportion of his total errors which resulted from over-estimation or under-estimation.

It is immediately obvious that the greater the total error the more errors tend to be made in a single direction. Despite the fact that the constant error measure and the total error measure can logically be uncorrelated, it is also clear that the scatter diagram formed by these plots would indicate a very high correlation between them (correlating over- and under-estimations with the total error separately). Figure 16 indicates that this state of affairs is true for the EL discs in size-estimation, too. Figure 17 shows that this is true too, though to a somewhat lesser extent, even for the size-estimation of the identical projected discs.

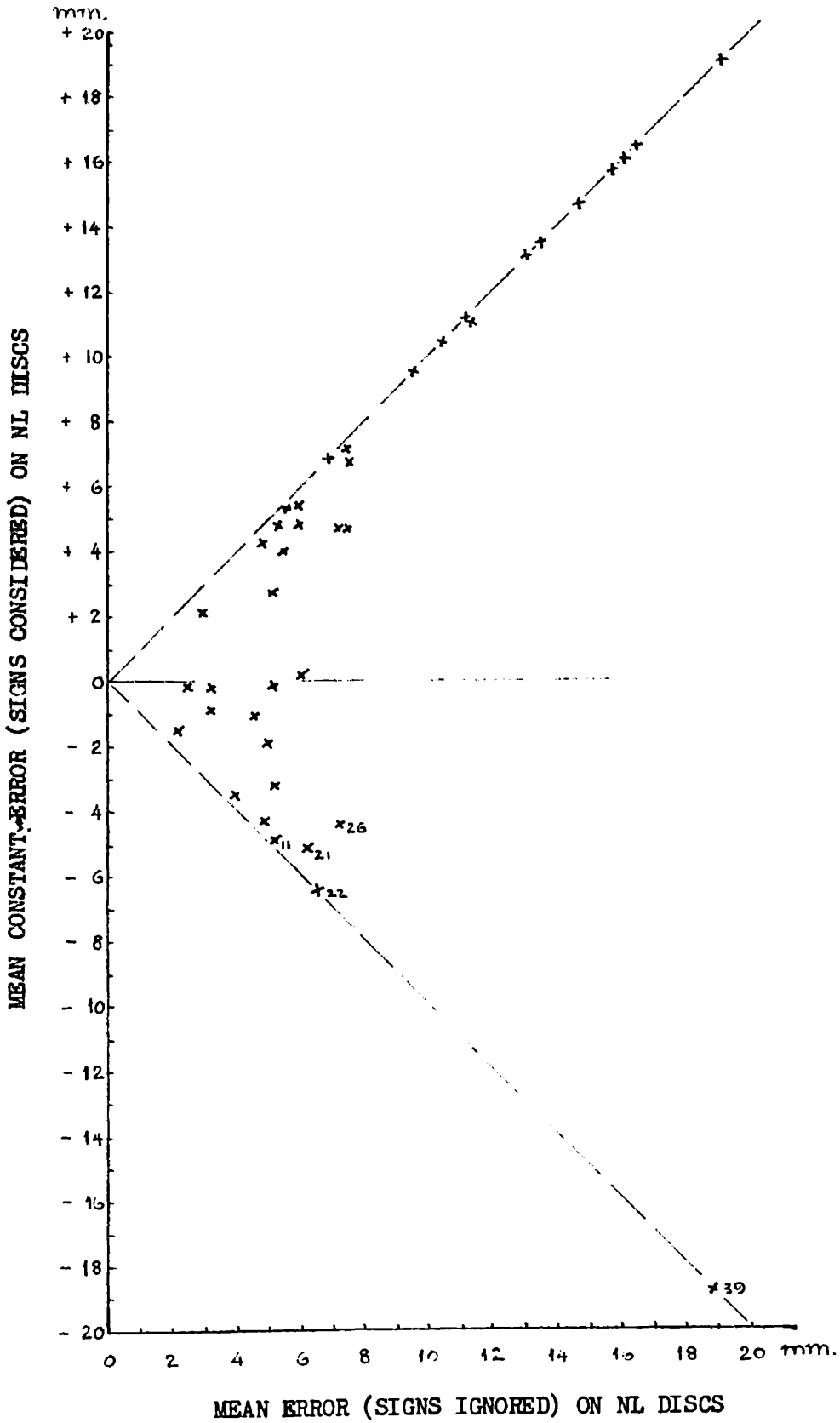


Figure 15. Size-estimation test. Relation of arithmetic-error (signs ignored) to constant-error (signs considered) on neutrally-loaded (NL) discs.

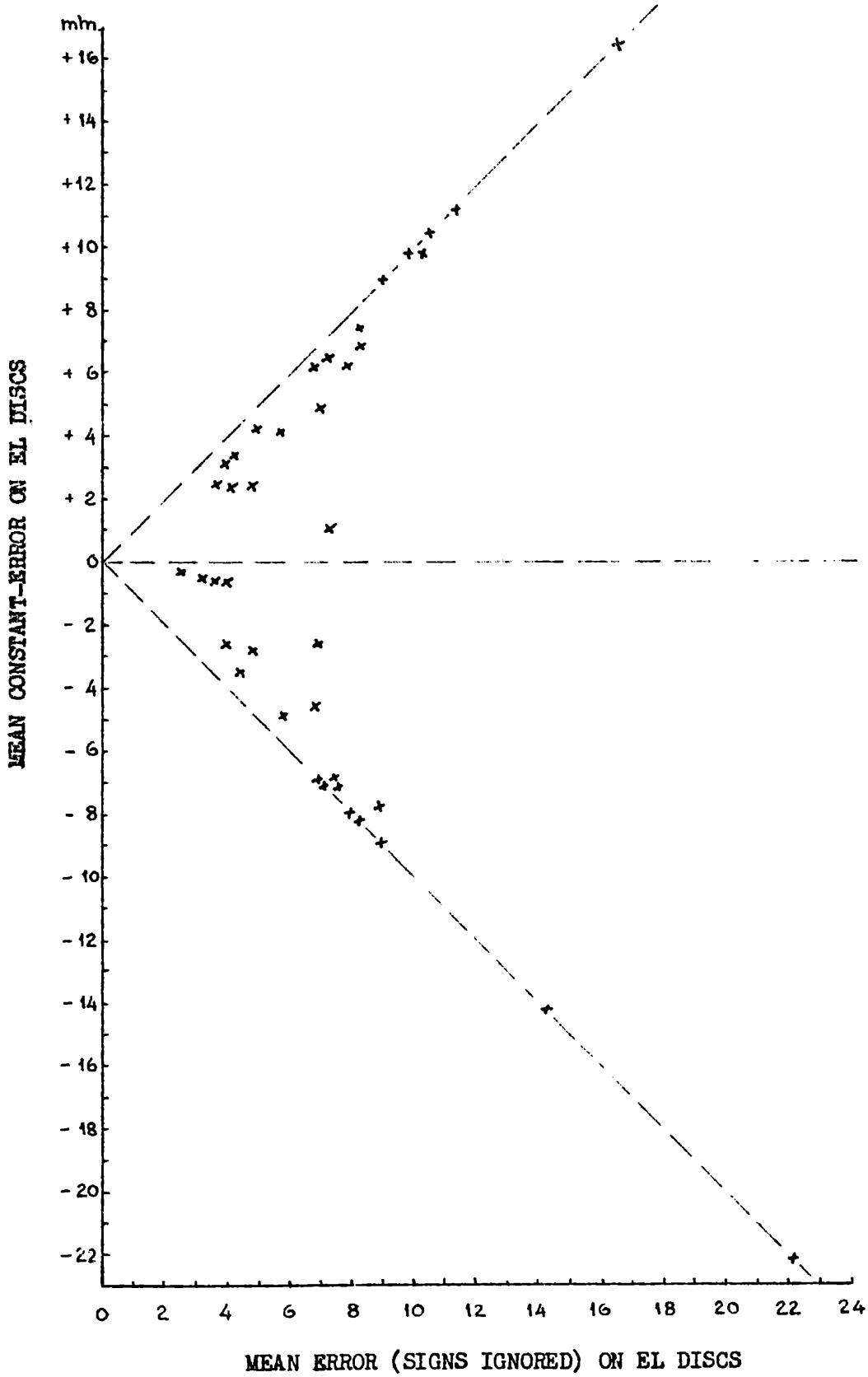


Figure 16. Size-estimation test. Relation of arithmetic-error (signs ignored) to constant-error (sighs considered) on emotionally-loaded (EL) discs.

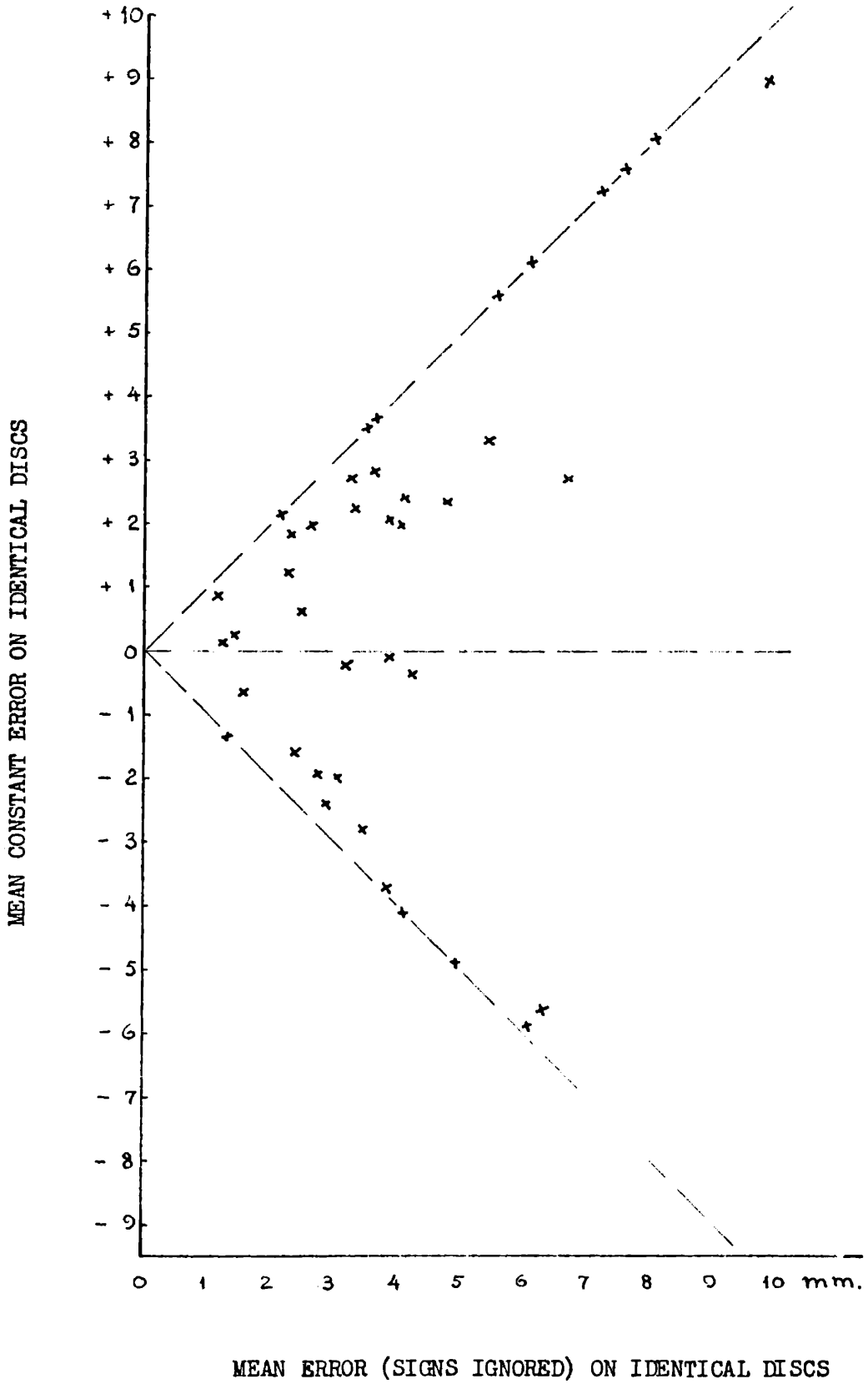
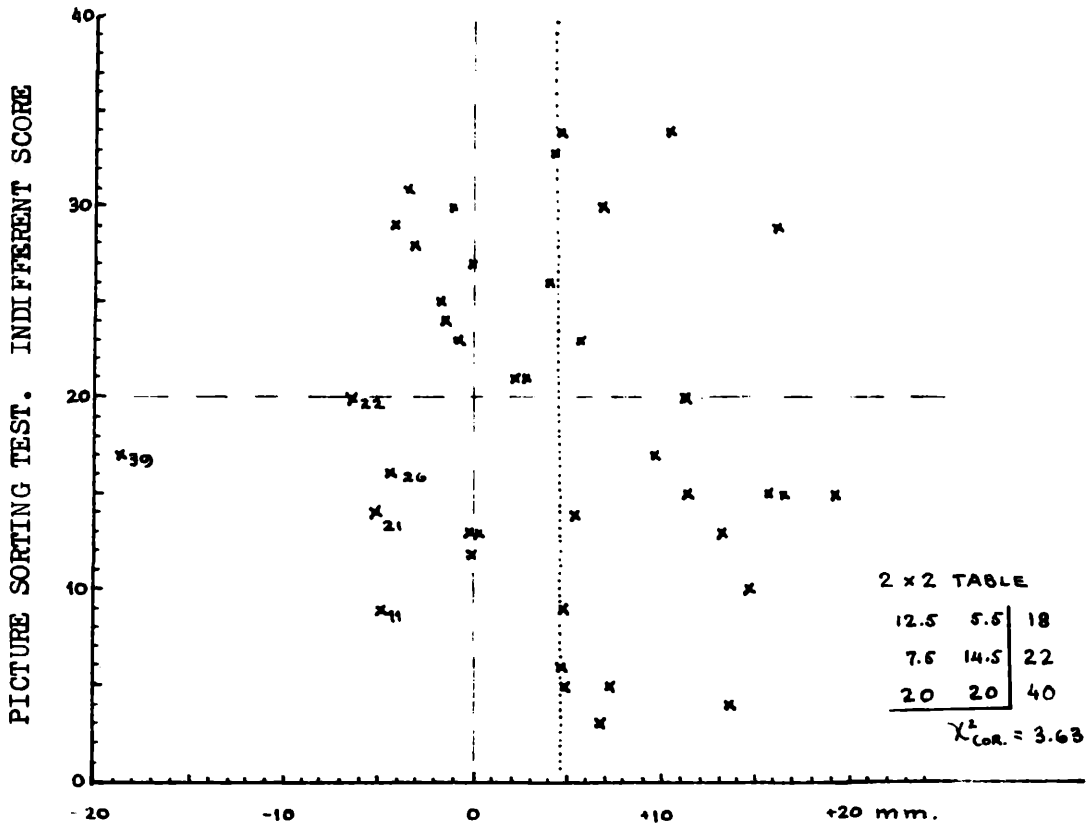


Figure 17. Size-estimation test. Relation of arithmetic-error (signs ignored) to constant-error (signs considered) on "identical" discs.

The significance of this finding of high correlations between our total error measures and constant error measures is that in any comparison of the two measures we would be in many cases comparing the same scores. We are thus in no position to make a firm comparison between the two measures with the data at hand. It would be interesting, however, to make even a tentative comparison between them. In order to do so we would have to ignore those scores which are the same in both measuring systems (and from which we should, therefore, be able to make identical predictions) and confine ourselves to those scores which differ in the two measuring systems and from which we might have different expectations. In the case of our defining task, size-estimation of the NL discs, we should be most interested to see whether the high and relatively high under-estimators (and there are only a few of them) tend to behave more in the fashion predicted for subjects who make high total error or whether they behave differently.

Figure 18 plots the constant errors in size-estimation of our NL discs against the picture-sorting test indifference scores. While the scattering of plots will obviously not yield an appreciable correlation coefficient, a two-by-two table formed by dividing the indifferent category score distribution at the chance frequency of 20 and the constant error distribution at its median yields a chi-square corrected for continuity of 3.63, which is significant at somewhat better than the .05 level for a two-tail test. As was observed above, the high and relatively high over-



SIZE ESTIMATION TEST. CONSTANT ERROR ON NL DISCS. DOTTED LINE DIVIDES SIZE ESTIMATION DISTRIBUTION AT MEDIAN, 4.8 mm.

Figure 18. Relation of constant-error (signs considered) in size-estimation of neutrally-loaded (NL) discs to number of indifferent ratings in picture-sorting test.

estimations which contribute strongly to the relationship here are the same high total error scores which contributed to the strong relationship seen in Figure 8. The crucial question must be answered by looking at the larger under-estimations (excluding those under-estimations given by subjects in the focussing group, i.e., the ten subjects lowest in error).[1] Referring once again to Figure 15, we find that the plots of the five subjects giving the largest under-estimations are numbered. These same subjects' plots are numbered in Figure 18. It is immediately clear that these five subjects behave on the picture sorting test in the manner predicted for high total error subjects, and their location in the in the present constant error scatter diagram tends to diminish rather than enhance the relationship. It seems reasonable to expect that in a larger sample with a greater number of consistent under-estimators the relationship between constant error on these discs and the picture sorting test indifference score would be much lower, if not wiped out entirely.

---

1. Obviously an important consideration here is the bias of the entire distribution toward over-estimation. There are relatively few under-estimators among our subjects and fewer still of these are consistent under-estimators. Thus, while our data are not sufficient to make a final distinction between these two measures, the behavior of the few relatively consistent under-estimators available to us for study is suggestive.

The effectiveness of the constant error score in predicting inventory responses was discussed previously in connection with Figure 12. It seems clear here, too, that the consistently high under-estimators behave in the same manner as the high over-estimators and that the relationship between the size-estimation task and the inventory is best demonstrated by the total error measure.

Figure 19 is a scatter diagram plotting the constant error in size-estimation for the NL discs against the color-word interference score. The clustering of scores obviously will not yield a significant correlation coefficient. A two-by-two table formed by dividing the two distributions along their medians yields a chi-square which is not significant at the 5 per cent level. The constant error measure does not seem even as efficient a predictor of the color-word interference score as was the total error measure plotted in Figure 10.

To sum up the findings in connection with direction of error: We have shown that the consistencies in constant error cannot be related to the other experimental tasks in the same manner as could the total error measure. This is not to suggest that the facts of consistent over-estimation and consistent under-estimation among subjects are unimportant ones. Far from it, they suggest that at least one additional varisble in cognitive organization is operating. This thesis, however, is not prepared to suggest the nature of the variable or what its consequences might be. It should be clear from the foregoing that in terms of the tasks and hypotheses with which

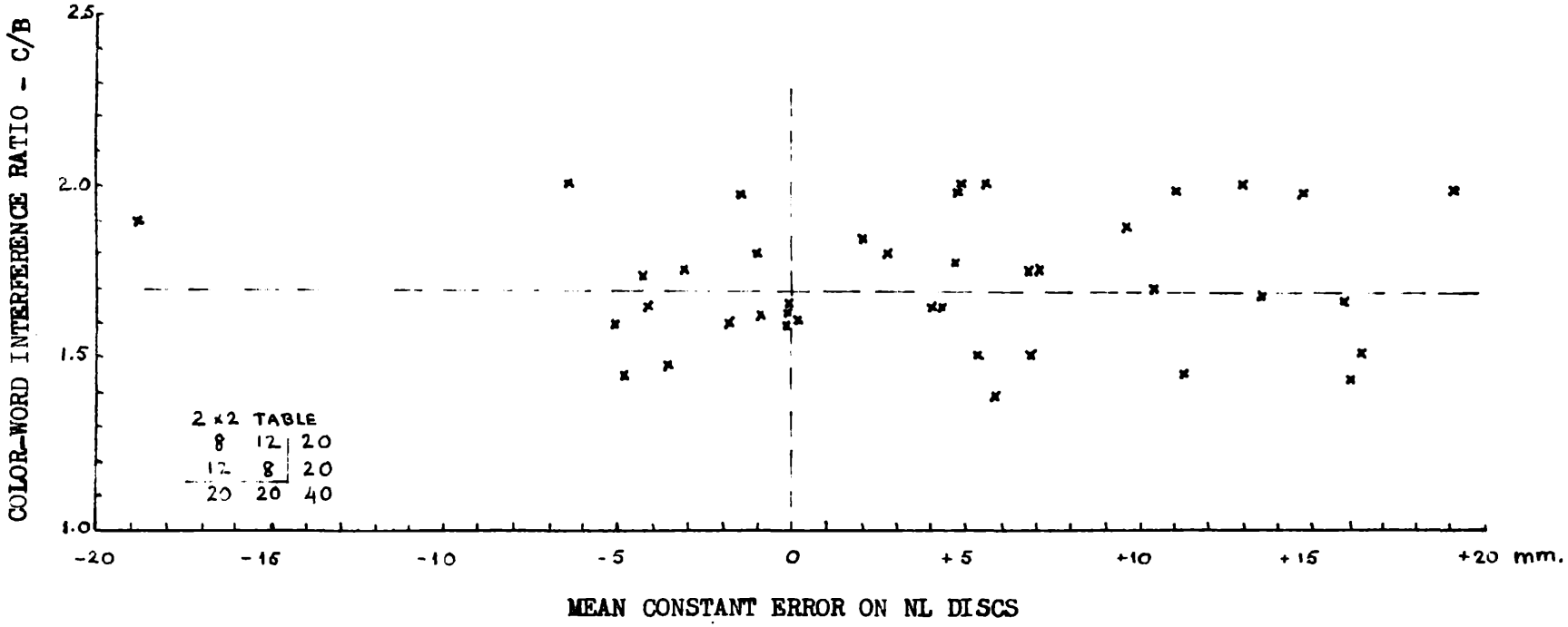


Figure 19. Relation of constant error in size-estimation of neutrally-loaded (NL) discs to amount of interference in color-word interference test. C/B ratio is time needed to read colors with words interfering to time needed to read colors alone.

this investigation has been concerned, those subjects who under-estimate considerably and those who over-estimate considerably may be combined and compared with those who do neither.

CHAPTER IX

DISCUSSION

IMPLICATIONS AND SUGGESTIONS FOR FURTHER WORK

It might be well, before detailing some of the broader implications of the relationships we have found, to summarize them and the rationale which led us to look for them.

The amount of error in the size-estimation of NL discs was shown to predict the amount of error in the size-estimation of EL discs indicating that a more general explanation is necessary for errors in size-estimation than one based on the direct influence of emotional stimulation. The prediction of the amount of error in the size-estimation of the ILL discs also support this indication. The case for the cognitive attitude of focussing advanced to account for these findings was strengthened when it was shown that the amount of error in the size-estimation of the NL discs could also be used to predict the number of indifferent ratings given by subjects to a series of pictures to which they were required to react in terms of their immediate feeling of liking or dislike. High accuracy on the size-estimation task was associated with many indifferent ratings. The link making this relationship understandable was that in the size-estimation task the set required was to attend only to the relevant stimulus-attribute of size and ignore or suppress the possible intrusive stimulation offered by the irrelevant differences in color, texture, etc., of the NL discs and the emotion-laden associations

to the pictures facing the EL discs. Effective performance on this task was thus seen to be a function of being able to take a set to exclude irrelevancies in the field. The picture-sorting test, on the other hand, explicitly made task-relevant just those kinds of feelings or emotional associations which in the size-estimation task were task-irrelevant. The relationship obtained between these tasks showed that facility in adopting the task-set for narrowed and focussed attention implied a relative inability to adopt the opposing one of permitting a broad acceptance of stimulation both from the stimulus field and from within the person and offered support to the suggestion that a personality variable was involved in the apparent preference for the one or the other type of task set. Accuracy in size-estimation was also shown to be probably related to color-word interference.

The prediction by the size-estimation error score of the personal inventory responses related to the experiencing, expression and control of emotions lent further support to this suggestion. Those subjects who were least accurate in the size-estimation task and who gave fewest indifferent ratings on the picture-sorting test described themselves on the personal inventory as being freer in their expression of emotions, exercising less suppressive control over them and being in more open communication with their emotions than those subjects who were most accurate and gave more indifferent ratings.

The most plausible alternative hypothesis to account for the consistencies in the size-estimation task, that our subjects differ only in perceptual acuity, in an "absolute" ability to be accurate, could hardly explain the relationships to the picture-sorting task or to the personal inventory nor would it have led us to look for them. This alternative hypothesis, however, was more directly shown to be untenable by the demonstration that accuracy in size-estimation in the presence of a practical minimum of irrelevant stimulation in the field was not significantly related to accuracy in size-estimation of the NL, EL or ILL classes of discs. The "ability" hypothesis was also weakened by the finding that those subjects who were least accurate on the NL discs improved in accuracy when judging the EL discs whose irrelevancies were more patent and provoked greater attention to the task.

The predictions we made and the relationships found have led us step-wise from a task traditionally considered "pure perception" to a facet of personality functioning far removed from any obvious connection with perception. These unlikely predictions were derived from our hypothesized cognitive attitude of <u>focussing</u>, a concept which permits us to tie together in a single explanatory framework behaviors traditionally regarded as having little in common.

Perhaps the major contribution of this thesis has been to show that the search for "relationships between personality and perception" has generally overlooked at least one important variable: the cognitive organization of the perceiver. This finding highlights one consequence of thinking of perception and personality as two realms which are distinct and relatively autonomous but which, under special circumstances, influence each other. As observed previously, the kind of influence which has most often been studied has been that in which motivation (as an aspect of personality) has interfered with perception. Even the choices of concepts (e.g., autism) indicates the nature of the influence which is presumed. It is as if in some quarters the spirit of the investigations inspired by the "new look" has been to debunk the purity of perception and show that human frailties, needs and goals can as easily play hob with laboratory-derived principles of perception as they can with life outside the laboratory. There seems to be an implicit value judgment, however, that, though perception is not the virginal thing she was reputed to be, nevertheless she ought to be so. It is hard to escape the implications that "autism" for instance, is bad and that "accentuation" tells something about us to our discredit--that these are flaws in our ability to perceive. The investigators who have identified these phenomena have in effect extended the maxim, "to err is human", into the formerly aseptically precise reaches behind the brass instruments.

These implied values reflect in part the stress that the largest segment of our civilization places upon accurate perception, upon calm objectivity which judges the "facts" while hoping for the triumph of reason. Perception, according to such a view, should give us the facts and tell us how the world really is. That perception might simultaneously project upon the world outside some consequences of inner processes could only reflect a disorder in a basically faithful reproducting system. We would thus be forced to the conclusion that if perception is "healthy", it will be as the traditional textbook format would have it, autonomous and independent in principle, if not always in fact. Perhaps it is implicit thinking of this kind which in part dictates the choice of tasks such as size-estimation that build arenas for conflicts between "basically orderly" perception and "basically undisciplined" motivations. In such situations "good perceivers" would be expected to show little "interference" by the emotional stimulation.

The size-estimation task introduced emotionally tinged stimuli as extraneous and irrelevant intrusions upon the task. The value or needs so represented were expected to intrude upon and interfere with performance. This is, of course, not the necessary relationship of values or needs to perception. It would not be hard to think of instances were values and needs are appropriate guides to perception--but this is not so in the usual situations in which this mal-influence is measured.

Perhaps more thought about our values about perception might lead us to reconsider the use of such tasks as size-estimation as paradigms for the study of personality and perception. If this paper has made a contribution toward this end, it will be by having shown that in choosing such a paradigm, we in effect, place a value upon one style of cognitive organization or personality organization and suppress others. By an unwitting pars pro toto we then are led to draw conclusions about perception and personality organization in general.

One consequence of subsuming value and need effects upon perception under the general heading of dealing with irrelevancies in perception is that we are led to look at the influence of other, non-motivational, task-irrelevant variables. As long as the problem is viewed solely in terms of the influence of motivation upon perception, no more general theory is possible. The work and imagination which led to the proposing of such concepts as "autism" and "accentuation" succeeded in prying the study of perception loose from the confines of laboratory investigations of autochthonous processes and stimulus variables.

These studies added the qualification to our knowledge about perception that while perception indeed has its own laws, there are situations ("flukes", as it were) in which the "normal" course of perceptual events is "influenced" by a motivational variable.

We believe that a larger theory of behavior, within which general theories of perception and personality must be lodged, will result not from tearing down the barriers between two adjacent chapter headings in the text book of general psychology--perception and motivation--but by reformulating the problem so that at the focus of our investigations is not a rarified abstraction, perception or motivation, with their interrelationships, but rather the perceiver. Without him no study of perception would be possible.

Our hypothesized cognitive attitude has led us to make predictions which experimentation has, on the whole, borne out. The mere fact of successful, statistically acceptable predictions is not enough, however, to force acceptance of the theory from which they sprang. It is necessary not only to be able to span the gaps between isolated and self-contained areas of behavior or experience, but also to show that the isolation and self-containment were more apparent than real. While the earlier presentation of our hypothesis suggested that we might look for relationships between accuracy in size-estimation and emotional experience, no strong case was made for the likelihood of finding such a relationship.

Perhaps we can make clearer the links between our defining task of size-estimation in the presence of irrelevancies in the field and qualities of personality functioning having to do with the experience, expression, and control of emotions. We can draw a parallel between the explicit task-set--to be accurate--for the size-estimation test and the kinds of implicit sets which may be

taken by people in the course of everyday behavior. The injunction, "be accurate," can be paraphrased as, "make your experience conform exactly with the size-attribute of the stimulus." Viewed in this way, the size-estimation task, uni-dimensional as it is, shares a great deal with much of extra-laboratory experience.

It is certainly true that much, if not nearly all, of our everyday behavior is governed by the "reality principle." By this shorthand expression we mean that in our everyday behavior we act with respect to objects and other people under circumstances in which our behavior and evaluation of situations must need be predictable. Our behavior and experiences conform far more than less to standards and conventions which either coincide with some objective fact, some thing "out there," or with some consensus. This conformity and predictability of everyday behavior requires that we frame our experience in a structure of conventional logic. To the extent that we are "adjusted," we think logically and act consistently upon these thoughts.

Yet at the same time we all have within us the potentiality for a quite different mode of functioning. We have inner needs, feelings, emotions, and affects which, in a regime ordered by logic and convention, must frequently be ignored or suppressed if our "primary" logical purposes are to be served. In the most general sense, these inner processes often may be intrusive irrelevancies upon the course of logical thinking and behavior. In behaving as we are each expected to in our everyday lives, the fact that

we are hungry, or tired, or in love, or angry, that we are capable of liking or disliking, are all extraneous. We function in spite of feeling quite differently or even at cross-purposes from the way know we must act.

These observations re-state truisms. We reiterate them only to make the point that people may well differ in the degree to which they must exclude from their everyday experience the knowledge, recognition, and "sense of community" with their feelings and emotions. For some people the possibility of a non-logical mode of response may be more threatening than for others. For some, we can suppose, there is not only the common necessity to act differently from the way they may feel, but, further, they must not feel differently from the way they act. In terms of our theory we could say that such people organize their experience around a "core" attitude, a principle of focussing. The essence of the resulting styles of experience is the minimizing of the potentially intrusive, emotional aspects of their personalities. The adaptive advantage gained in this way, we presume, is the lessening of the threat to such persons of a possible disturbance of reality testing.[1]

---

1. We are indebted for some of our hunches about the relationship of focussing and emotional experience to Freud's formulations about the defense mechanism of isolation (27). While focussing and isolation seem to share common ground, it cannot be claimed, on the basis of this study, that they have the same meaning.

It is a matter of common observation that some people permit a great deal more communication with their feeling-states than do others and that this does not necessarily interfere grossly with reality testing or conventional behavior. We merely think of some people as more labile, perhaps more impulsive, than others and their opposite numbers perhaps as more "businesslike," "cold," or "dry." We must emphasize once again that we are not distinguishing between good and bad in personality organization but are indicating various possible styles of organization. We are not making invidious comparisons among these styles. We are merely pointing out that they exist and that they have different consequences for a theory of cognitive and personality organization.

We believe that we have established at least a plausible analogy between the formal structure of the size-estimation test and that of everyday goal-directed behavior. Perhaps further experimentation and/or advances in theory will shed light upon this and the further question implied: Why are people organized so differently?

We cannot hope to anticipate all the questions which arise in the reader's mind as he re-traces our exploration, but we are aware of several large issues about which we hope he would have questions. Some of these have been underlined in the text of the paper.

Certainly more work is needed to discover the meaning of the impressive consistencies in direction of error among our subjects. We have been able to show only (and only with a moderate degree of certainty) that directional consistencies do not relate to the cognitive attitude of focussing. In terms of our predictions, extreme over-estimators and extreme under-estimators were shown to be much more like each other than either was like an accurate subject. The facts of these directional consistencies remain, however, and only additional work will settle the puzzling question of their meaning.

The issue of generality of prediction to perceptual tasks other than size-estimation was left almost as open as when we first raised it. While the color-word test gave us mild encouragement, the distance-estimation test only raised new issues without answering any of the questions we put to it. Other tasks which it might be interesting to sample in follow-up studies are weight-estimation tasks and loudness discrimination tasks having the same formal structure with regard to irrelevancies as the size-estimation task. A distance-estimation task in which the experience of distance is unequivocal would also be a valuable addition to such a study.

Our picture sorting test was intended to meet the need for a task requiring a set opposite to narrowed and focussed attention upon stimulus attributes and it was fairly successful in meeting this need. It would help clinch the point we wanted to make if

other tasks were devised in which stress on non-focussing or a broadened acceptance of stimulation could be demonstrated, not by poor performance, as on the size-estimation task, but on its own terms.

We raised another problem when we demonstrated that people differ in their cognitive and personality organization and stress various principles of organization in different degrees. It is only natural to ask, if one does not in doing so expect an immediate answer: How can we account for the difference? Perhaps such a question must wait until we have established the facts of differences in organization more firmly. If we may speculate in advance of the millenium when all the facts are neatly in place, perhaps we can suggest that we will need to have recourse to some genetic theory.

A more imminent problem is that of the relationship between focussing and other cognitive attitudes (47) which have been experimentally isolated through the medium of tasks different in many ways from our size-estimation task and yet similar to it in other ways. As with the other questions we have raised here, we have no ready answer for this one. We can only affirm its importance and state that data have and are being collected which may shed some light upon it.

CHAPTER X

SUMMARY

The purpose of this thesis was to demonstrate that a cognitive attitude of focussing can be used to account for individual differences in a task requiring accuracy in the presence of irrelevant and intrusive stimulation. This cognitive attitude, or perceptual style, was used to predict individuals' performances in other tasks permitting an approach in terms of narrowed, focussed attention or in terms of a broad, inclusive, and less critical acceptance of stimulation.

Forty subjects were asked to estimate the sizes of hand-held discs, some of which (NL) bore irrelevant stimulation in the form of surface color, texture, or weight and others of which (EL) bore pictures having open sexual or aggressive connotations. Two other discs (ILL) bore circular forms which made the estimation of their sizes difficult. An analogous task in distance-estimation was also employed but gave equivocal results and is not reported upon here. A picture sorting test measured ability to take a set for broadened acceptance of stimuli, particularly emotional stimuli which in other contexts might be deemed task-irrelevant. A color-word interference test offered an additional measure of susceptibility to interference. A personal inventory measured the degree to which subjects in their everyday life favored free expression of feelings, minimum control over them and maximum attunement to them.

Subjects' accuracy on the NL discs was shown to be predictive of accuracy on the EL and ILL discs as well as of performance on the picture sorting test, color-word interference test, and personal inventory. It was demonstrated that a perceptual attitude was at work rather than merely an ability to be accurate by showing that these relationships did not hold when accuracy in size-estimation under conditions of minimum irrelevant stimulation was used as a criterion.

Strong tendencies in direction of error as well as accuracy were demonstrated in the size-estimation task. However, no relation could be demonstrated between direction of error and performance on the other tasks.

Implications of the findings were discussed in relation to what is commonly thought of as "good" and "bad" performance in perception and in terms of the current fashion of ascribing particular perceptual effects to personal values, needs, or other states of the organism. The thesis attempted to demonstrate that a significant and often overlooked variable is the way in which the person is organized cognitively to deal with value, need, or other stimuli which may intrude upon the task.

APPENDIX

TABLE VII

VARIANCE TABLE FOR DATA FROM SIZE-ESTIMATION TEST IN PILOT STUDY ON SIXTEEN SUBJECTS

Source	df	Sum of Squares	Mean Square	F	p
Subjects	15	825.620	55.04	52.92	.01
Discs	19	95.837	5.04	4.84	.01
Interaction subjects X discs	285	878.10	3.08	2.96	.01
Within cells	960	1,004.637	1.04		
TOTAL	1279	2,804.185			

TABLE VIII

SCORES ON ALL TESTS FOR FORTY SUBJECTS

SIZE ESTIMATION TEST

	Mean Error for three classes of discs, Main Test			Mean Error on Pre-Test discs Part I		Part II	
S	5 NL discs	2 ILL discs	5 EL discs	"Ident." disc	Gray disc	Heavy disc	Difference Heavy - Gray
1	2.04	5.95	7.08	.73	1.54	1.89	.35
2	2.56	4.25	4.70	1.58	2.22	2.30	.08
3	2.97	3.85	3.59	.35	2.27	3.72	1.45
4	3.14	3.20	2.56	1.80	1.87	1.57	- .30
5	3.20	1.65	3.90	.90	1.87	1.42	- .45
6	3.84	8.40	7.46	.53	4.95	4.15	- .80
7	4.58	6.50	8.86	1.40	2.25	1.90	- .35
8	4.72	4.10	4.90	.70	2.37	3.02	.65
9	4.82	6.30	8.92	1.24	.98	1.84	.86
10	4.94	7.75	6.92	1.38	1.61	.82	-1.33
11	5.02	9.70	8.20	1.02	.85	1.04	.19
12	5.06	7.00	7.96	.80	2.84	2.77	- .93
13	5.06	4.15	5.36	.87	2.15	2.20	.05
14	5.10	4.70	5.72	.60	3.64	4.39	.75
15	5.26	4.55	3.98	.80	2.27	2.27	.00
16	5.40	5.40	4.00	.73	1.94	1.32	- .62
17	5.50	9.55	10.30	1.55	3.89	2.52	-1.37
18	5.82	5.00	3.90	.95	3.15	3.94	.79
19	5.98	3.65	3.20	1.02	1.27	2.22	.95
20	6.00	3.05	6.72	1.06	2.07	3.27	1.20
21	6.12	8.10	7.94	.38	3.93	3.66	- .27
22	6.42	11.15	14.20	.33	2.05	1.47	- .58
23	6.88	3.46	3.66	.26	3.17	4.27	1.10
24	7.20	7.90	7.80	.96	2.82	5.64	2.82
25	7.26	5.35	6.98	.65	1.87	1.90	.03
26	7.28	5.05	7.40	.70	2.60	2.00	- .60
27	7.42	3.90	4.88	1.67	3.52	4.24	.72
28	7.46	5.30	7.14	.96	2.92	3.27	.35
29	9.64	5.30	4.20	2.02	3.95	7.19	3.24
30	10.40	10.30	9.84	.62	6.32	6.65	.33
31	11.30	6.95	5.68	.78	9.00	8.32	- .68
32	11.36	7.05	8.18	2.48	4.72	5.22	.50
33	13.08	12.35	10.50	.87	9.87	11.19	1.32
34	13.50	8.45	8.98	1.89	6.40	8.07	1.67
35	14.70	4.65	6.72	1.04	5.99	6.87	.88
36	15.80	8.45	8.20	.96	4.22	6.90	2.68
37	16.10	13.85	11.26	.91	7.75	8.00	.25
38	16.50	7.30	7.04	1.52	9.37	10.57	1.20
39	18.80	23.60	22.14	.58	6.96	7.50	.54
40	19.20	15.95	16.56	.56	9.85	11.32	1.47

Note.--Basic score is total arithmetic error for four trials per disc in millimeters.

SCORES ON ALL TESTS FOR FORTY SUBJECTS (CONTINUED)

SIZE ESTIMATION TEST (CONTINUED)

	Mean Error, Individual discs, Part III												Mean Error Part IV
	NL discs				ILL discs			EL discs					"Ident."
S	Hvy.	Gray	Red	Blk.	Yel.	Chair	Hat	Man	Clch.	Elec.	Fuz.	Prn.	Disc
1	1.4	2.5	4.8	3.8	3.5	6.6	5.3	4.0	8.3	9.4	3.2	10.5	1.28
2	2.5	4.6	1.8	2.5	1.4	4.5	4.0	3.8	3.3	3.6	4.9	7.9	1.74
3	5.7	4.0	1.2	2.6	1.2	3.9	3.8	2.4	2.4	3.1	6.5	4.5	.97
4	3.9	2.7	2.7	3.1	3.3	2.1	4.3	3.9	0.9	2.2	2.5	3.3	1.95
5	3.2	5.4	1.6	1.5	3.9	1.0	1.9	2.2	4.1	3.2	3.1	6.9	1.02
6	6.1	3.2	5.9	7.4	5.2	9.0	10.4	4.4	7.9	9.3	6.9	11.6	1.01
7	4.0	2.4	4.5	5.2	6.8	6.9	6.1	5.3	10.2	11.0	4.8	13.0	.91
8	9.0	5.8	2.8	2.6	3.2	3.4	4.8	11.3	4.2	2.3	4.8	1.9	.36
9	1.8	3.2	6.6	9.8	6.3	6.7	6.7	4.6	7.5	9.6	10.5	12.4	.29
10	4.0	3.9	7.3	6.0	3.5	6.9	8.6	5.0	8.7	5.9	7.0	8.0	.73
11	3.3	4.3	4.7	6.0	6.8	9.8	9.6	3.8	6.8	9.3	8.8	12.3	----
12	6.2	2.9	2.7	7.4	6.1	8.6	5.4	6.1	9.8	5.1	10.1	8.7	----
13	5.9	6.1	6.3	2.6	4.4	3.6	4.7	5.5	4.0	9.7	.6	7.0	1.85
14	3.1	5.7	7.1	5.6	4.0	3.3	6.1	1.9	7.8	6.1	4.9	7.9	.36
15	6.8	10.8	2.2	2.1	4.4	4.4	4.7	2.5	4.3	4.9	5.7	2.5	1.50
16	6.4	13.1	3.5	2.4	1.6	10.9	3.3	7.7	2.7	2.6	3.8	3.2	1.01
17	7.1	6.1	5.5	3.2	5.6	8.7	10.4	13.6	7.9	8.4	6.3	5.4	----
18	9.5	8.3	3.9	6.3	1.1	3.5	3.8	6.2	4.0	3.5	2.8	5.7	.71
19	8.2	7.4	4.5	5.7	4.1	3.2	4.1	4.0	1.0	2.6	3.2	5.2	.44
20	7.2	4.0	4.7	6.5	7.6	3.8	2.3	5.9	8.3	6.4	5.9	7.1	1.16
21	2.9	6.0	7.0	9.6	5.1	8.9	7.3	4.3	7.4	9.3	5.9	12.8	----
22	5.1	3.4	8.1	9.9	5.6	13.1	9.2	9.5	15.4	14.6	12.8	18.7	.69
23	10.1	7.7	7.7	4.0	4.9	4.8	2.2	5.9	2.5	3.6	3.9	2.4	.87
24	8.5	8.5	6.7	9.7	2.6	8.6	7.2	6.8	8.5	5.7	9.1	8.9	1.03
25	11.1	7.1	6.4	4.3	9.1	3.5	7.2	9.0	5.2	5.0	9.5	6.2	1.35
26	10.2	3.3	5.1	12.7	5.1	6.9	3.2	3.0	7.0	12.6	4.4	10.0	----
27	10.0	5.6	8.9	6.0	6.6	5.1	2.7	10.4	4.3	3.2	4.3	2.2	1.50
28	9.2	7.0	6.7	7.6	6.8	5.5	5.1	6.9	4.3	8.7	7.0	8.8	1.34
29	14.6	12.2	7.1	8.2	6.1	4.8	5.8	8.3	2.0	2.0	6.2	2.5	1.47
30	11.9	11.5	9.3	7.7	9.6	11.2	10.5	14.0	10.5	9.3	9.6	5.8	.47
31	12.0	14.9	11.8	7.5	10.3	5.2	8.7	8.8	4.3	4.3	7.7	3.3	.66
32	13.1	16.1	9.6	10.5	7.5	6.3	7.8	9.1	4.2	6.8	13.1	7.7	.95
33	13.6	14.9	12.6	10.5	13.8	10.9	13.8	15.4	12.6	5.1	9.8	9.6	.72
34	17.4	15.5	10.4	15.3	8.9	5.1	11.8	7.6	9.2	7.6	11.9	8.6	2.55
35	19.6	15.2	15.2	10.3	13.5	4.1	5.2	8.3	4.2	3.0	14.2	3.9	1.14
36	18.7	16.2	15.8	13.5	14.8	7.2	9.7	11.6	9.2	4.5	11.0	4.7	1.20
37	24.1	13.0	15.3	14.2	13.9	17.3	10.4	13.5	10.5	8.9	17.3	6.1	----
38	20.0	15.1	13.6	16.8	16.6	5.1	9.5	10.3	5.9	7.2	7.7	4.1	.50
39	16.3	18.5	21.5	17.9	20.2	23.9	23.4	16.9	21.9	26.3	17.9	27.7	1.94
40	17.7	17.7	18.4	24.1	18.1	17.8	14.1	20.7	15.7	14.7	20.6	11.1	1.13

SCORES ON ALL TESTS FOR FORTY SUBJECTS (CONTINUED)

	PICTURE-SORTING TEST						COLOR-WORD INTERFERENCE TEST			
	Number of Pictures Sorted As:			Mean Time (seconds) for each choice category			Total Time (Seconds			
S	Like	Indif.	Disl.	Like	Indif.	Disl.	Sheet A	Sheet B	Sheet C	C/B
1	20	24	16	3.30	2.90	2.90	34.4	70.3	138.4	1.97
2	18	27	15	1.60	1.57	1.40	23.2	37.0	69.2	1.60
3	22	21	17	4.41	5.74	4.69	33.6	51.0	94.8	1.85
4	16	23	21	1.32	2.40	2.20	31.8	46.0	75.0	1.63
5	25	12	23	3.81	3.78	3.46	33.5	59.2	99.2	1.67
6	11	31	18	1.58	1.45	1.55	43.4	83.0	123.6	1.48
7	17	30	13	2.77	3.19	2.96	30.4	51.2	92.8	1.81
8	17	33	10	6.52	6.20	5.64	34.8	66.6	110.0	1.65
9	7	29	24	2.26	1.97	2.23	36.0	46.0	76.2	1.65
10	20	25	15	4.95	4.40	3.95	35.6	68.8	110.8	1.61
11	24	9	27	3.90	4.24	3.64	37.8	67.6	98.2	1.45
12	21	28	11	2.14	2.30	2.20	38.8	69.8	123.6	1.76
13	22	21	17	3.50	3.36	3.65	34.4	55.0	99.0	1.80
14	25	13	22	2.57	3.11	3.00	29.6	55.4	92.4	1.66
15	39	5	16	2.35	2.92	2.57	37.4	56.2	109.2	2.02
16	8	26	26	2.25	2.06	2.42	35.0	72.0	119.2	1.65
17	26	14	20	2.79	3.47	3.62	40.2	62.0	94.0	1.51
18	34	9	17	4.83	6.00	6.84	37.6	70.4	98.2	1.39
19	21	23	16	4.94	6.50	5.20	36.8	58.6	122.0	2.08
20	17	13	30	2.98	2.92	3.65	37.2	58.2	94.1	1.61
21	17	14	29	3.86	3.67	2.98	39.0	63.0	101.2	1.60
22	18	20	22	2.55	2.51	2.40	41.2	63.4	131.8	2.08
23	19	30	11	5.30	5.50	5.20	41.0	68.0	103.6	1.52
24	14	34	12	5.00	3.90	3.60	32.2	51.4	102.0	1.98
25	28	5	27	1.97	2.96	2.11	46.0	70.2	122.4	1.76
26	21	16	23	2.79	2.93	2.68	33.4	51.2	89.2	1.74
27	26	3	31	2.70	4.46	2.60	35.2	48.5	85.6	1.76
28	26	6	28	2.80	2.83	2.32	33.0	73.6	130.8	1.77
29	20	17	23	3.54	3.52	3.76	33.0	68.6	130.0	1.89
30	16	34	10	3.61	3.70	3.38	30.6	46.8	80.0	1.70
31	26	15	19	3.06	3.77	3.53	39.2	68.0	99.2	1.45
32	16	20	24	3.72	4.00	3.20	37.8	48.6	96.4	1.98
33	22	13	25	2.10	2.06	2.20	29.0	54.8	115.4	2.10
34	32	4	24	5.30	6.20	4.84	30.8	49.0	82.2	1.68
35	40	10	10	4.00	4.20	3.40	42.8	69.2	135.6	1.96
36	20	15	25	2.53	2.16	3.07	34.6	62.0	103.2	1.66
37	13	29	18	5.23	5.00	6.14	30.2	56.2	81.2	1.44
38	15	15	30	4.11	5.70	4.00	31.8	51.0	79.0	1.54
39	34	17	9	7.07	5.43	4.32	35.0	64.4	124.8	1.90
40	18	15	27	1.70	1.84	1.85	37.4	76.8	150.2	1.95

SCORES ON ALL TESTS FOR FORTY SUBJECTS (CONTINUED

PERSONAL INVENTORY

	No. of Agreements with Key
1	17
2	23
3	25
4	20
5	33
6	18
7	23
8	22
9	27
10	25
11	24
12	34
13	21
14	13
15	31
16	23
17	24
18	22
19	12
20	23
21	37
22	30
23	32
24	23
25	27
26	36
27	19
28	27
29	30
30	23
31	24
32	27
33	26
34	35
35	28
36	37
37	26
38	29
39	33
40	19

TABLE IX

RELIABILITIES OF PRINCIPAL EXPERIMENTAL TESTS*

Test	Reliability Coefficient
Size-Estimation Test:	
NL discs	.81
ILL discs	.76
EL discs	.69
Picture-Sorting:	
Indifferent choices	.82
Personal Inventory:	
Agreements with Key	.71

*Computed by means of Kuder-Richardson Formula 21.

TABLE X

FORTY-SIX PERSONAL INVENTORY ITEMS RELATING TO COMMUNICATION WITH, EXPRESSION OF, AND CONTROL OF EMOTIONS

See page 43 for explanation of key

NO.	ITEM	KEY
3.	I tend to form "crushes" on people easily.	T
9.	I can't honestly say that I have ever been in love.	F
10.	Sometimes I talk myself into feeling the way I think I should.	F
11.	Even when I am most excited or angry there is always a part of me which stays aloof, cold, and uninvolved.	F
12.	When others around me lose their heads and become involved I can usually remain cool and collected.	F
17.	I am slow to warm up to people as friends.	F
22.	I can't bear to see an animal in pain.	T
23.	I can get considerable relief for my feelings out of a good cry.	T
26.	I manage to enjoy myself at most anything I do.	T
34.	I become very squeamish at the sight of blood.	T
35.	No one knows the way I really feel about things.	F
40.	My mood tends to be quite stable; I tend to feel about the same regardless of weather or little events of the day.	F
41.	I consider myself a rather unemotional person.	F

TABLE X (CONTINUED)

NO.	ITEM	KEY
42.	I like to keep my private feelings hidden even from people who know me fairly well.	F
44.	I'm more the "happy-go-lucky" type than a moody type of person.	T
53.	I find that I tend to be guided more by my feelings about things than what I know about them.	T
56.	Sometimes I get so emotionally involved in a question that I can't think straight.	T
57.	I sometimes have the experience of remembering a painful or frightening incident and find that I still shudder even at the thought of it.	T
58.	My judgment of a person is likely to be influenced by the way I feel about him.	T
60.	My spirits depend very much on my surroundings; a gloomy room makes me feel that way too.	T
69.	I don't really like or dislike anybody.	F
83.	I frequently notice that when others around me are deeply moved (saddened) I have no particular feeling one way or the other.	F
86.	I have a rather sentimental attitude toward most things in life.	T
87.	I am frequently only amused by things which might disturb other people.	F
88.	I am never quite sure of what I feel about anything.	F
95.	Giving way to one's emotions seems to me a sign of weakness.	F

TABLE X (CONTINUED)

NO.	ITEM	KEY
96.	At the movies I identify myself easily with the characters on the screen and feel almost as if I were going through their adventures.	T
102.	At different times I seem to love and hate the same people.	T
103.	I sometimes wish I could feel as deeply about things as other people seem to.	F
105.	I feel that I am temperamentally different from most people.	F
106.	When I find myself close to tears at a sad part of a movie I try to suppress them and not be so emotional.	F
107.	I can get quite angry, but it usually blows over quickly.	T
109.	I find that I feel with my friends; when they are happy, I am happy.	T
111.	I sometimes feel "empty"; without any feeling at all.	F
112.	Sometimes, even though I know how I ought to feel, I don't really feel that way.	F
118.	Sometimes I talk myself out of having feelings.	F
122.	I'm easily moved to help people who are sick, unfortunate, or unhappy.	T
123.	I don't get much fun out of life.	F
126.	I am easily moved to tears by a sad part in a movie.	T
127.	I'm apt to fall in love rather easily.	T
128.	My spirits get a real lift out of a sudden nice change in the weather.	T

TABLE X (CONTINUED)

NO.	ITEM	KEY
130.	I pride myself on my self control.	F
131.	I usually feel free to tell a person what I think about him.	T
135.	I'm inclined to "let myself go" emotionally.	T
137.	I don't make a secret of the way that I feel about anything.	T

BIBLIOGRAPHY

1. Ansbacher, H. Perception of number as affected by the monetary value of the objects. Arch. Psychol., 1937, 215.

2. Ansbacher, H. Judgments of number of postage stamps: A continuation to the psychology of social norms. J. Psychol., 1938, 5, 347-350.

3. Ashley, W. R., Harper, R. S., and Runyon, D. L. The perceived size of coins in normal and hypnotically induced economic states. Am. J. Psychol., 1951, LXVI, 564-672.

4. Baker, K. H. Pre-experimental set in distraction experiments. J. gen. Psychol., 1937, 16, 471-488.

5. Baker, K. E., Wylie, R. C., Gagne, R. M. The effects of an interfering task on the learning of a complex motor skill. J. Exp. Psychol., 1951, 41, 1-9.

6. Belmont, L. and Birch, H. G. Re-individualizing the repression hypothesis. J. Abn. Soc. Psychol., 1951, 46, 226-235.

7. Binet, A. La measure des illusions visuelles chez l'enfant. Rev. Philos., 1895, 40.

8. Boernstein, W. On the functional relations of the sense organs to one another and to the organism as a whole. J. gen. Psychol., 1936, 15, 117-131.

9. Brewer, P. W., Ammons, R. B., and Ammons, C. N. Influence of brief noise on rotary pursuit performance. Mot. Skills Res. Exch., 1951, 3, 10-15.

10. Bruner, J. S. Personality dynamics and the process of perceiving. in R. R. Blake and G. V. Ramsey, (Eds.) Perception: An Approach to Personality, New York: Ronald Press, 1950.

11. Bruner, J. S. and Goodman, C. Value and need as organizing factors in perception. J. Abnorm. Soc. Psychol., 1947, 42, 33-44.

12. Bruner, J. S., Postman, L., and MacGinnies, E. Personal values as determinants of perceptual selection. Amer. Psychologist, 1947, 8, 285 (Abstract).

13. Bruner, J. S. and Postman, L. Tension and tension release as organizing factors in perception. J. Personality, 1947, 15, 300-306.

14. Bruner, J. S. and Postman, L. Symbolic value as an organizing factor in perception. J. Soc. Psychol., 1948, 27, 203-208.

15. Bruner, J. S. and Postman, L. Perception, cognition and behavior. J. Personality, 1949, 18, 14-31.

16. Bruner, J. S. and Rodrigues, J. S. Some determinants of apparent size. Paper read at A.P.A., Chicago, 1951. (Abstract in Amer. Psychologist, 6, 1951, 317-318.)

17. Bullough, E. On the apparent heaviness of colors. Br. J. Psychol., 1907, 2, 111.

18. Cameron, N. and Cameron, M. A. Experimental studies in thinking: I. scattered speech in the responses of normal subjects to incomplete sentences. J. Exp. Psychol., 1943, 32, 617-627.

19. Campbell, N. The cognitive aspects of motor performances and their bearing upon general motor ability. J. Exp. Psychol., 1936, 19, 323-333.

20. Carter, C. F. and Schooler, K. Value, need and other factors in perception. Psychol. Rev., 1949, 56, 200-207.

21. Crafts, L. W. et al. Recent Experiments in Psychology, New York: McGraw-Hill, 1938 (Chapter 14).

22. Crosland, H. R., Taylor, H. R., and Newsome, S. J. Intelligence and susceptibility to the Muller-Lyer illusion. J. Exp. Psychol., 1927, 10, 40-51.

23. Dashiell, F. J. Fundamentals of General Psychology. New York: Houghton Mifflin, 1937, 455.

24. De Camp, J. E. The influence of colour on apparent weight. J. Exp. Psychol., 1917, 2, 347.

25. De Silva, H. R. and Golub, B. L. The influence of smell on reaction time. J. gen. Psychol., 1937, 16, 279-282. (Abstract.)

26. Durup, G., and Pierson, H. Un conflict perceptif: distance et dimension. J. Psychol. Norm. Path., 1940, 41, 37, 38, 415-417.

27. Freud, S. The Problem of Anxiety, New York: Norton, 1936.

28. Gilbert, G. M. Inter-sensory facilitation and inhibition. J. gen. Psychol., 1941, 24, 381-407.

29. Gibson, J. J. The reproduction of visually received forms. J. Exp. Psychol., 1929, 12, 1-39.

30. Graham, C. H. Behavior and the psychophysical methods; An analysis of some recent experiments. Psychol. Rev., 1952, 59, 62-70.

31. Graham, C. H. Visual perception. In S. S. Stevens, (Ed.), A Handbook of Experimental Psychology. New York: John Wiley, 1951.

32. Gundlach, C. and Macowbrey, C. The effect of color on apparent size. Am. J. Psychol., 1931, 43, 109.

33. Hartman, G. W. Changes in visual acuity through simultaneous stimulation of the other senses. J. Exp. Psychol., 1933, 16, 383-392.

34. Hartridge, H., Phelps, J., and Weil, R. An illusion of size. Nature, Lond. 1945, 156, 118-269, 636-637.

35. Henderson, M. T., Crews, A., and Barlow, J. A study of the effect of music distraction on reading efficiency. J. appl. Psychol., 1945, 29, 313-317.

36. Henneman, R. H. A photometric study of the perception of object-color. Arch. Psychol., 1935, 179.

37. Hevner, K. Experimental studies of the affective value of colors and lines. J. appl. Psychol., 1935, 19, 385.

38. Howard, H. J. A test for the judgment of distance. Am. J. Ophthal, 1919, 2, 656-675.

39. Holway, A. H. and Boring, E. G. Determinants of apparent visual size with distance variant. Am. J. Psychol., 1941, 54, 21-37.

40. Huang, I. The size-weight illusion in relation to the perceptual constancies. J. gen. Psychol., 1945, 33, 43-63.

41. Huang, I. The size-weight illusion and the "weight-density illusion." J. gen. Psychol., 1945, 1945, 33, 65-84.

42. Katzin, D. and Murray, E. Instability in color-naming in normal and anomalous observers. Am. J. Psychol., 1934, 46, 611.

43. Klein, G. S. Adaptive properties of sensory functioning. Bull. Menninger Clin., 1949, 13, 16-23.

44. Klein, G. S. and Schlesinger, H. J. Where is the perceiver in perceptual theory? J. Personality, 1949, 18, 32-47.

45. Klein, G. S. The personal world through perception. In R. R. Blake and G. V. Ramsey, (Eds.) Perception: an approach to personality. New York: Ronald Press, 1950, 328-355.

46. Klein, G. S., Schlesinger, H. J., and Meister, D. E. The effect of personal values on perception: an experimental critique. Psychol. Rev., 1951, 58, 96-112.

47. Klein, G. S. and Salomon, A. Cognitive style and regulation of need. Amer. Psychologist, 1952, 7, 321-322. (Abstract.)

48. Laird, D. A. The influence of noise on production and fatigue, as related to pitch, sensation level, and steadiness of the noise. J. appl. Psychol., 1933, 17, 320-330.

49. Lambert, W. W., Salomon, R. L., and Watson, P. D. Reinforcement and extinction as factors in size-estimation. J. Exp. Psychol., 1949, 39, 637-641.

50. Levine, R., Chein, I., and Murphy, G. The relation of the intensity of a need to the amount of perceptual distortion: a preliminary report. J. Psychol., 1942, 283-293.

51. McClelland, D. C. and Atkinson, J. W. The projective expression of needs: I. the effect of different intensities of the hunger drive on perception. J. Psychol., 1948, 25, 205-222.

52. McDougall, W. Outline of Abnormal Psychology. New York: Scribners, 1926.

53. McGinnies, E. The role of value orientation in perception and association. Doctors dissertation, Harvard University, 1948.

54. Minturn, A. L. and Reese, T. W. The effect of differential reinforcement on the discrimination of visual number. J. Psychol., 1951, 31, 201-231.

55. Murphy, G. Personality: a biosocial approach to origins and structure. New York: Harper, 1947.

56. Murray, H. A. Explorations in Personality. New York: Oxford University, 1931.

57. Pastore, N. Need as a determinant of perception. J. Psychol., 1949, 28, 457-475.

58. Piaget, J. and Lambercier, M. The visual comparison of heights at variable distances in the fronto-parallel plane. Arch. Psychol, Geneve, 1943, 29, 175-253.

59. Piaget, J. and Lambercier, M. The problem of visual comparison in depth-size constancy--and the systematic error of the standard. Arch. Psychol., 1943, 29, 255-308.

60. Postman, L. and Bruner, J. S. The reliability of constant errors in psychophysical measurements. J. Psychol, 1946, 21, 293-299.

61. Postman, L. and Bruner, J. S. and McGinnies, E. Personal values as selective factors in perception. J. Abn. Soc. Psychol., 1948, 43, 142-154.

62. Proshansky, H. and Murphy, G. The effects of reward and punishment on perception. J. Psychol., 1942, 13, 295-305.

63. Rosenthal, B. G. Attitude towards money, need, and methods of presentation as determinants of perception of coins from six to ten years of age. Amer. Psychologist, 1951, 6, 317. (Abstract.)

64. Rosenthal, B. and Levi, J. Value, need and attitude toward money as determinants to perception. Amer. Psychologist, 1950, 5, 313.

65. Ryan, T. A. Interrelations of sensory systems in perception. Psychol. Bull., 1940, 37, 659-698.

66. Ryan, T. A. Work and Effort: The Psychology of Production. New York: Ronald Press, 1947.

67. Sanford, R. N. The effect of abstinence from food upon imaginal processes: a preliminary experiment. J. Psychol., 1936, 2, 129-136.

68. Sanford, R. N. The effect of abstinence from food upon imaginal processes: a further experiment. J. Psychol., 1937, 3, 145-159.

69. Sargent, S. S. How shall we study individual differences. Psychol. Rev., 1942, 49, 170-181.

70. Seashore, R. H. Work Methods: an often neglected factor underlying individual differences. Psychol. Rev., 1939, 46, 123-141.

71. Schlosberg, H. Stereoscopic depth from single pictures. Am. J. Psychol., 1941, 54, 610-615.

72. Schonbar, R. A. The interaction of observer pairs in judging visual extent on movement: the formation of social norms in "structured" situations. Arch. Psychol., 1945, 299.

73. Serrat, W. D. and Karwoski, T. An investigation of the effect of auditory stimulation on visual sensitivity. J. Exp. Psychol., 1936, 19.

74. Schafer, R. and Murphy, G. The role of autism in a visual figure-ground relationship. J. Exp. Psychol., 1943, 32, 335-343.

75. Sheehan, M. R. A study of individual consistency in phenomenal constancy. Arch. Psychol., 1938, 222.

76. Sherif, M. A study of some social factors in perception. Arch. Psychol., 1935, 187.

77. Smith, K. R. Intermittent loud noise and mental performance. Science, 1951, 114, 132-133.

78. Stroop, J. R. Studies in interference in serial verbal reactions. J. Exp. Psychol., 1935, 18, 643-61.

79. Taylor, J. A. The relationship of anxiety to the conditioned eyelid response. J. Exp. Psychol., 1951, 41, 81-92.

80. Thurstone, L. L. A factorial study of perception. Psychometric Monog., 1944, 4.

81. Valentine, W. L. Experimental Foundations of General Psychology. New York: Rhinehart, 1949. (Chapter 8)

82. Vernon, M. D. The perception of distance. Brit. J. Psychol., 1937, 28, 1-11, 115-149.

83. Warden, C. J. and Flynn, E. L. The effect of color on apparent size and weight. Am. J. Psychol., 1926, 37, 398.

84. Washburn, M. F. and Crose, S. L. Voluntary control of likes and dislikes. Am. J. Psychol., 1921, 32, 284.

85. Woodworth, R. S. Experimental Psychology. New York: Holt, 1938.

86. Woodworth, R. S. Psychology. (fourth edition) New York: Holt, 1945.