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DEFINING INTOLERANCE OF AMBIGUITY

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Current tests of intolerance of ambiguity suffer from two grave faults—the measures are not logically consistent operational definitions of the concept, and they have poor psychometric properties.

The logical implications of the theory of intolerance of ambiguity were reduced to a set of defining characteristics. Two of these attributes were used to generate two tests which operationally define these attributes, and are not inconsistent with the rest of the defining characteristics. The two tests, measures of "need for categorization," and "need for certainty," were examined for their psychometric properties. Their distributions satisfied the usual psychometric criteria, and their intercorrelations showed that the two dimensions were positively related.

The concept of intolerance of ambiguity has been employed by many investigators of personality either as a descriptive device, where personalities are classified as falling along a tolerance-intolerance continuum, or in a causal sense, where some observable facet of behavior is deemed to be a function of the person's cognitive style with respect to ambiguity.

Most current workers in this field base their definitions of intolerance of ambiguity upon Frenkel-Brunswik's (1949; 1954) work, whose own definition of the concept was generated by case study material gleaned from interviews of persons high or low on this variable. Her definition was essentially a description of the characteristics persons at either extreme of the continuum might exhibit. Unifying her empirical observations was the assumption that intolerance of ambiguity has generality, in at least two senses. First, it generalizes to the entire emotional and cognitive functioning of the individual, characterizing his cognitive style, his belief and attitude systems, his interpersonal and social functioning, and his problem solving behavior. Second, intolerance of ambiguity generalizes to other sense modalities, in particular to the perceptual apparatus, so that the person intolerant of ambiguity in the emotional and cognitive sphere would exhibit similar characteristics in his perceptual behavior. Finally, Frenkel-Brunswik related intolerance of ambiguity to other personality variables, predicting a positive relationship with the authoritarian family of personality traits.

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Kenny and Ginsberg (1958), in an exhaustive study of a wide range of tests purporting to measure intolerance of ambiguity, found no significant correlation between these measures. They also found that none of the measures correlated significantly with authoritarianism. Kenny and Ginsberg concluded that there is no support for the notion of the sort of generalized concept of intolerance of ambiguity proposed by Frenkel-Brunswik.

In the present study an attempt will be made to show that Kenny and Ginsberg's findings are in part attributable to the methodological and psychometric characteristics of the tests used to define intolerance of ambiguity, and that the generality of the concept is a matter yet to be empirically determined.

Attributes of Intolerance of Ambiguity

The implications of Frenkel-Brunswik's theory can be organized into a set of defining characteristics of the concept of intolerance of ambiguity.

Primary characteristics: intolerance of ambiguity is characterized by (a) rigid dichotomizing into fixed categories--"need for categorization"; (b) seeking for certainty and avoiding ambiguity--"need for certainty"; (c) inability to allow for the co-existence of positive and negative features in the same object, e.g. "good" and "bad" traits in the same person; (d) acceptance of attitude statements representing a rigid white-black view of life; (e) a preference for the familiar over the unfamiliar; (f) a positive rejecting of the different or unusual; (g) resistance to reversal of apparent fluctuating stimuli; (h) the early selection and maintenance of one solution in a perceptually ambiguous situation; (i) premature closure.

Secondary characteristics: persons intolerant of ambiguity will be (a) authoritarian; (b) dogmatic; (c) rigid; (d) closed minded; (e) ethnically prejudiced; (f) uncreative; (g) anxious; (h) extrapunitive; (i) aggressive.

Intolerance of ambiguity, then, can be described in terms of certain criterion characteristics which define the concept, and the dimension can also be placed within a cluster or family of other personality variables of which it is a member.

One would have thought that the method of proceeding to put Frenkel-Brunswik's theory to a test would have been to set out a schema such as the one described, find measures which operationally define each of the characteristics, and inspect the obtained correlation matrix. Instead, usually one or another of the criteria is seized on as *the* measure of intolerance of ambiguity, a test is constructed, which may or may not be compatible with other implications of the theory, and then this test is related to some "criterion" variable, generally one of the tests of the authoritarian cluster of variables.

Logical Errors in Test Construction

Two examples of faulty methodology will be presented through an analysis of the tests used by Hamilton (1957) and Draguns and Multari (1961).

Hamilton included in his battery the following two tests:

1. Length discrimination. Sixteen lines on a uniform background were compared with a line of standard length. Twelve of the lines were objectively equal to the standard, two were clearly shorter, and two clearly longer. The Ss were told that none of the lines was equal to the standard, and they were required to sort the lines into three categories: (a) longer; (b) shorter; (c) may be longer or shorter, I can't decide which.

2. Ambiguous drawings. A series of twelve drawings was presented. Three were clearly cars, three clearly houses, three drawings were indefinite, and three contained in the same drawing simultaneously, features characteristics of both houses and cars. Ss had to sort the drawings into three categories: (a) house; (b) car; (c) may be either a house or a car, I can't decide which.

In both cases, the index of intolerance of ambiguity was the number of responses in the "cannot say" category, with the fewer the items in this category the greater the intolerance of ambiguity, on the grounds that the person intolerant of ambiguity would be disturbed by unclassifiable, ambiguous stimuli, and would force even rather dubious material into one of the available categories.

Now this rationale is consistent with attributes (a) "need for categorization," (h) "the early selection and maintenance of one solution in a perceptually ambiguous situation," and (i) "early closure." However, when we consider attribute (b) "need for certainty," precisely the contrary implication holds. Persons who have a high need for certainly are not going to commit themselves to a position unless absolutely certain that they are not going to be in error. Being motivated by the "quest for certainty," they will abstain from making any decisions which might conceivably be rash ones. Such persons ought to make many "cannot say" responses.

We have here then the absurd position where one part of the theory will predict that the person intolerant of ambiguity will effect "early closure" on Hamilton's task, whereas another part of the theory will predict "late closure." It is suggested that the fault lies not in the theory, but in the type of task selected by Hamilton to define the concept.

The same point can be made about the procedures of Draguns and Multari (1961). These authors presented a number of stimulus series, each varying from vagueness to definiteness. The series were constructed by drawing an object, e.g. a sail boat, and then photographing the draw-

ing with the object progressively moved out of focus. Each series consisted of twelve such progressively more distorted pictures of the original drawing.

The series were presented with the most blurred picture first, then the next most blurred, and so on, each picture being presented for 10 seconds. Ss were instructed to report to *E* when they thought they could tell what the picture showed.

Draguns and Multari's index of intolerance of ambiguity score was the number of the picture (from 1-12) on which S ventured to report seeing some sort of a concrete object, i.e. when S was prepared to commit himself.

Now what does early recognition of ambiguous stimuli in a progressive series signify? Does it characterize the individual highly intolerant of ambiguity, the anxious person whose need for early closure (attribute i) will bring about accelerated attempts at labelling vague objects and imbuing them with meaning? Or does early recognition characterize the individual highly tolerant of ambiguity, with an undemanding "need for certainty" (attribute b), who is open minded and receptive to even the vaguest of stimuli, and prepared to come to a decision about them, unperturbed by the possibility of making an error?

Psychometric Errors in Test Construction

Tests which are widely used in measuring intolerance of ambiguity often have very poor psychometric properties. An examination of the psychometric characteristics of the tests used in the Kenny and Ginsberg study (Table 1) reveals that many of the tests have markedly skewed distributions and distorted means, e.g. their Kind-of-Person test, with a range of 0-7 has a mean of .88 and a S.D. of .89.

TABLE 1
CHARACTERISTICS OF THE MEASURES OF INTOLERANCE OF AMBIGUITY AND AUTHORITARIANISM IN KENNY & GINSBERG'S (1958) STUDY

Test	Mean	S.D.	Range
Passive, Reversals	13.79	7.61	2-50
Active, Reversals	28.49	17.28	6-94
Arrested, Reversals	11.47	6.02	0-28
Walk's A Scale	17.09	3.62	8-25
Trait Discrepancy	7.37	1.95	2-12
Kind-of-Person	.88	.89	0-7
Blocks	1.67	1.27	0-6
Total Questions	3.79	3.07	0-16
Discrepancy, Autokinetic	3.41	3.98	0-26.5
Consistency, Autokinetic	3.82	2.88	0-9
Confidence, Autokinetic	42.11	7.03	22-50
Undecided Answers	5.41	3.58	0-14
Authoritarian Submission	27.54	7.71	12-43

Clearly tests with such poor psychometric properties can hardly be expected to contribute meaningful information, and are out of place in a correlational study. Kenny and Ginsberg's study must be considered

as inconclusive, since the statistical nature of the tests they use is highly suspect, and will bias the results towards obtaining insignificant correlation coefficients. Kenny and Ginsberg have conclusively shown that the existing tests of intolerance of ambiguity do not generate a general factor. However their statement "in so far as the present measures may be regarded as relevant indicators of the intolerance of ambiguity construct, the results offer little support for a general construct of intolerance of ambiguity," (p. 304) cannot be accepted, because the measures are suspect, often both on logical and on statistical grounds.

The Rationale of the Present Study

Clearly intolerance of ambiguity, as Frenkel-Brunswik conceived of it, is a complex dimension, composed of a number of sub-dimensions. This study is concerned with two of these sub-dimensions, the need to fit objects or events into categories, and the need for certainty, and it will be demonstrated that provided the stimulus situation is appropriately arranged, these two variables are positively related, i.e. that the person who has a need for categorization, will also seek certainty. Two tests which measure these dimensions were operationally defined in such a way as to be logically consistent with the entire set of attributes deemed to be the defining characteristics of the concept, and special attention was paid to the psychometric properties of the measures.

METHOD

Two tasks, each measuring two attributes of intolerance of ambiguity, were constructed.

1. Need for categorization test. Attribute (a) "need for categorization," implies that in a situation in which there are no clear cut categories or classes, persons with a high need for categorization, when instructed to classify the stimulus objects, will order them into *more* categories than persons with a low need for categorization.

2. Need for certainty test. Attribute (b) "need for certainty," implies that in a situation where there are no clear cut categories or classes, persons with a high need for certainty, when instructed to classify the stimulus objects, will take *more time* than persons with a low need for certainty.

Subjects

67 male and female introductory psychology students at the University of Hawaii served as Ss.

Apparatus

1. Thirty-nine "rocks," ranging in size from the size of a dime to that of a tennis ball were used. Most of the "rocks" were coral, but some were granite. They varied in angularity, porosity, color, and texture. The rocks were collected on Waikiki beach.

2. Sixty-eight "pictures" were cut from magazines. All were pictures of people, each picture containing only one person. The only restriction was size—all pictures were glued on 6″ by 4″ cards. Pictures of well

known persons were discarded. The pictures varied along at least the following dimensions: age, sex, race, dress, occupation, emotionality, and activity. Some were chromatic, whereas others were black and white. Most were photographs, but some were cartoons. Some were portraits, and there was a picture of a statue.

Procedure

Ss were individually tested. *E* said:"I am interested in how people classify things. I have here some rocks, and I would like you to put these into categories. Use as many or as few categories as you think necessary. (This was stressed, to ensure that a demand characteristic (Orne, 1962) to make as many classifications as possible, was not being established in the S.) Take as much or as little time as you like."

E then cleared the table, handed *S* the pack of cards, and said: "I now want you to do the same for these cards. Again, make as few or as many classifications as you think necessary, and take as much time as you like."

The order of presentation was uniform, rocks always preceding the pictures.

Scoring

Scores were the number of categories for each test, and time taken for each test. The time measure was transformed into 15 second units, so that for example a time of 6 minutes and 35 seconds yielded a score of 27.

RESULTS

Table 2 presents the N, range, mean, and S.D. for each of the tests. Table 3 presents the intercorrelations for the four tests. The coefficients are Pearson product-moment correlation coefficients.

TABLE 2
CHARACTERISTICS OF MEASURES OF "NEED FOR CATEGORIZATION" AND "NEED FOR CERTAINTY"

Test	N	Mean	S.D.	Range
Number of rocks	67	7.27	2.59	4-16
Time rocks	67	14.72	8.74	6-48
Number of pictures	67	13.56	7.28	2-39
Time pictures	67	43.96	18.49	5-99

TABLE 3
INTERCORRELATIONS AMONG MEASURES OF "NEED FOR CATEGORIZATION" AND "NEED FOR CERTAINTY"

Measures	2	3	4
1. Number of Rocks	.45	.62	.24
2. Time Rocks		.31	.47
3. Number of Pictures			.59
4. Time Pictures			

DISCUSSION

The aim of this study was to devise a measure of two aspects of

intolerance of ambiguity: "need for categorization" and "need for certainty." A perusal of the intercorrelations between Number of Rocks, Time of Rocks, Number of Pictures, and Time of Pictures, taken in conjunction with the psychometric properties of the four tests, indicates that the tests do measure some psychological function. The scores, especially on the sorting task, are nicely distributed, and the number of categories made for the two relatively different tasks is remarkably consistent (.62). The length of time spent in sorting the two series correlates well (.47), and the time taken to sort each series (NP-TP .59; NR-TR .45) is related to the number of categories made.

The question remains whether the results can be taken to signify that two distinct variables, "need to categorize" and "need for certainty," are being measured. It is clear that part of the correlation between the number of categories and the time taken to sort them can be accounted for by the fact that larger sorts tend to take longer. On the other hand, irrespective of the number of categories finally decided on, all Ss have to *handle* the same number of cards, and make the same *number* of decisions, i.e. where to place the card. The difference in length of time could be due to indecision as to where to classify a particular picture. Thus the person who makes fewer classes will also be quicker in his decision making, i.e. he will deliberate less, he will be less worried whether the decision he made is the correct one, whereas the person who takes an inordinate length of time in deciding where a card should go is clearly perturbed by the possibility of committing an error. The fact that this person is also one who makes a greater number of classifications, is consistent with Frenkel-Brunswik's theory. Thus it could be argued that a goodly proportion of the covariance is due to dynamic factors, rather than simply due to the mechanics of the situation. However, this is an empirical matter, to be cleared up by further research. What is needed is a study specifically designed in such a way that the scores are completely independent of each other. The main purpose of this report is to propose a model for defining the concept of intolerance of ambiguity, and to demonstrate a method for operationalizing such a model. Future work should be aimed at refining the procedures employed in measuring the two attributes of the concept dealt with in this paper, and once this task has been accomplished, to devise appropriate measures of the other attributes of the concept and examine the extent to which they are interrelated.

A concept such as "intolerance of ambiguity" has ultimately no meaning apart from the procedures through which it is operationalized. A research program of the kind outlined here may well result in the concept being drastically modified. Frenkel-Brunswik intuitively felt that intolerance of ambiguity had wide relevance as a descriptive and aetiological variable. The evidence for such generality is slight. This may be because existing measures are inadequate in one way or another, or because Frenkel-Brunswik's intuition was faulty. A more rigorous aproach in devising measures of the concept will of course not simply

result in better tests, but will effect a shift in its meaning, since the concept is identical with the procedures employed in defining it. In a very real sense therefore, this paper is concerned with a redefinition of the concept of intolerance of ambiguity. However, instead of beginning with a definition based on an abstract, rational consideration of a general principle underlying or describing a multitude of diverse behaviors, and then applying this principle to different situations, the writer proposes that this procedure be reversed. If it can be shown that a number of different behavioral and cognitive phenomena are related, and if it can be shown that "intolerance of ambiguity" is a useful explanatory theoretical notion, then those behaviors embraced by it are what the concept means. Those behavioral or cognitive phenomena which do not adequately intercorrelate with the rest of the measures in the matrix would have to be excluded from the connotation of the construct regardless of any claims based on rational or a priori grounds.

For Frenkel-Brunswik intolerance of ambiguity represented a fundamental personality orientation which profoundly influenced the entire cognitive and behavioral functioning of the individual. If the evidence substantiates such a view, well and good. It may however turn out that the construct is relevant in some areas, and not in others. In that case, the construct in so far as it has any meaning at all, will be applicable only to the areas in which it is relevant. To approach this problem by asking whether the concept has generality or specificity is in itself an indication of intolerance of ambiguity. The proper question to ask is how general the concept is.

CONCLUSION

Frenkel-Brunswik's theory of intolerance of ambiguity has never been adequately put to the test, a surprising conclusion in the light of the vast amount of interest the theory has generated. This study has been a first attempt at an empirical investigation of the concept. Future work in this area involves operationalizing each of the attributes of the concept of intolerance of ambiguity in such a way that unequivocal, mutually consistent predictions can be made, and designing tests with satisfactory psychometric properties. Only then will it be possible to make statements regarding the generality or specificity of the construct.

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