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## ABSTRACT

# MULTITRAIT-MULTIMETHOD MEASURE OF THE AFFECTIVE, BELIEF AND BEHAVIORAL INTENTION COMPONENTS OF THE ATTITUDE TOWARD PSYCHOLOGY

By

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This study investigated whether attitudes toward psychology could be measured in terms of feeling, belief, and behavioral intention components and if the behavioral intention component would have the greatest correlation with self-report measures of overt behaviors.

Two types of verbal scales, Likert and Thurstone, were used and yielded two different measures of each of the three components. The final scales were administered to 200 male and female introductory psychology students. A 6 x 6 multitrait-multimethod matrix was constructed from the intercorrelations among the three components (traits) as measured by the two scales (methods). Using the Campbell and Fiske [1959] criteria for analyzing the matrix, it was found that the three components possessed some degree of convergent and discriminant validity. However, the correlations between the six different scales and the behavioral measures did not yield different results for the three components.

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It was therefore concluded that the tripartite approach to the measurement of attitudes toward psychology is somewhat limited, due to the all-encompassing nature of the attitude itself.

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AND BEHAVIORAL INTENTION COMPONENTS OF  
THE ATTITUDE TOWARD PSYCHOLOGY

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## INTRODUCTION

Ostrom [1969] and Kothandapani [1971] have used multitrait-multi-method analysis procedures for testing the proposition that attitudes can be represented as having a three-component structure. There is some evidence in these studies that indicates that attitudes may be measured in terms of affect, belief, and behavioral intention components.

It is the purpose of this study to extend and modify the Ostrom and Kothandapani research to the domain of attitudes toward psychology and to investigate the attitude-behavior relationship. The research will include a multitrait-multimethod analysis of the three components as measured by Likert and Thurstone scales and the assessment of their convergent and discriminant validities. Also to be tested is the proposition that the behavioral intention component of an attitude is more strongly related to self-reported behavioral indices than are the affective or belief components.

In the paragraphs that follow, a brief resumé of research on the structure of attitudes will be concluded by an analysis of the attitude-behavior relationship. Discussion of attitude scaling, attitudes toward psychology, and multitrait-multimethod research provides background for the research.



### Structure of Attitudes

In surveying the historical development of the concept of "attitude," Gordon Allport [1968] emphasized the pervasiveness and definitional multiplicity of the term. From Titchener's [1909] debate about the place of attitudes in our consciousness to the classic definition of an attitude as "a mental and neural state of readiness. . . exerting a directive or dynamic influence upon the individual's response" [Allport, 1935], the concept of attitude has occupied an important position in the development of social psychology.

Doob [1947] applied behavioral terms to the concept of attitude, and thus extended the usual conception of an attitude beyond that of the subjective approach. By defining an attitude as an "implicit, drive-producing response," Doob emphasized internal aspects, anticipatory and mediating functions, and an attitude's potential to be evoked by a variety of stimuli. He also stressed the effects of learning, or conditioning, and the importance of an attitude within the social context as an evaluative mechanism.

Chein [1948] proposed an alternative explanation of attitude in his criticism of Doob's approach. He defined the concept of attitude as being both persistent and momentary and emphasized the structural processes of attitude formation.

An approach to attitude as a nonunitary structure was presented by Katz and Stotland [1959] who contended that an attitude included an evaluation, involving affective and cognitive elements, and a tendency to behave in a certain manner toward that attitudinal object, being the "degree of impulsion." They considered the affective component as the central aspect of the attitude, and it involved the

attribution of good-bad qualities to an attitudinal object. The cognitive component contained the belief held regarding the attitude object. It can be characterized by its degree of differentiation, degree of integration, and the generality/specificity of the beliefs. The behavioral component was the action directed toward the attitudinal object. If one behaved positively toward the object, then one's attitude was said to be "positive."

Rosenberg and Hovland [1960] similarly formulated the componential structure of an attitude. Defining the three components as did Katz and Stotland, they raised the problem of determining the relationship among the three components and the factors which affect those relationships.

In order to answer some questions about the interrelationships among components, Rosenberg [1960] attempted to induce change in the affective component and determine subsequent effects on the cognitive component. After expressing an initial measure of affect toward a particular social issue, subjects were hypnotized either one or two weeks later and given post-hypnotic suggestions. These suggestions consisted of explicitly telling a subject to feel differently toward a particular social issue that was previously found to be salient to that subject. Subjects were not given any facts to alter their beliefs, but they were merely told to change from positive to negative or from negative to positive. During the sessions, measures of their cognitions relative to the issues were also taken before and after the post-hypnotic suggestion.

Findings indicated that cognitive reorganization resulted from the induced affective change, and thus established evidence of some

degree of interrelationship between the attitude components of affect and cognition.

The "Foot-in-the-Door" study [Freedman and Fraser, 1966] had some implications for the theory of attitude structure. In one study, a group of subjects was initially contacted to comply with a small request and later with a larger request. A second group was only contacted for the large request. Freedman and Fraser found that subjects who were contacted for both the small and large requests were more likely to comply with the large request than were subjects who were only contacted for the large request. It was suggested that a "foot-in-the-door" effect was occurring: once someone became involved (by complying with the small request), he or she perceived him or herself as a "doer" and continued to do. Compliance with a larger request was then merely a continuation of appropriate action.

It could be said that change in one component of an attitude had an effect on the other components. Upon compliance with a small request, an individual has engaged in a specific behavior. According to congruency theory [Osgood and Tannenbaum, 1955], subsequent attitude readjustments can be inferred to occur as a result of that behavior. Then, reorganization of cognitive structure yielded an attitude that was consistent with the second request, and the individual complies in order to maintain that consistency. However, it is important to consider the extent to which a person will comply with the initial request. That is most likely to be determined by the magnitude of that request and the degree to which it resembles present attitudes. To request someone to engage in grossly discrepant behavior is likely to gain nothing but a

refusal, and no structural readjustment will occur. The small request can thus be viewed as an impetus for structural change, and the larger request merely bolsters that change.

Woodmansee and Cook [1967] attempted to analyze verbal attitude toward racial prejudice in terms of the affective, cognitive, and conative (or behavioral) components. Factor analysis failed to reveal three separate factors. Instead, in both methods of factor analysis employed, 11 factors were identified: integration-segregation policy, acceptance in close, personal relationships, Negro inferiority, Negro superiority, ease in interracial contacts, derogatory beliefs, local autonomy, private rights, acceptance in status-superior relationships, sympathetic identification with the underdog, and gradualism. However their conclusions may have been somewhat influenced by the methods that were employed in their construction of their scales. It appears that items from a collection of what was referred to as "conventional Negro content items" were categorized as representing one of the three components by the same individuals who originally compiled them. The rather ambiguous criteria for compiling and classifying items may have contributed to the wide variations in the obtained responses. As will be seen from the subsequent discussion of other studies, careful item compilation, item categorization using some rational basis for selecting items, and use of different attitudinal objects can yield much different results.

The hypothesized structure of attitudes is connected to the "real world" by our operationalizations of the concept of attitude. This has often consisted of verbal measures which are presumed to represent the construct of attitude. The degree of positivity or negativity of one's

attitude is inferred from one's responses to various statements which comprise an attitude scale. Two classic techniques for devising attitude scales, Thurstone and Likert, are discussed in the following section.

### Attitude Scales

Attitude scaling, the numerical assessment of the abstract products of human perceptions and experiences, involves an attitude object, a set of individuals, and an ordering of their responses to that attitude object. A variety of scales have been developed to measure attitudes, varying from measures of physiological responses to many different self-report techniques. Two classic scaling techniques under consideration in this study are the Thurstone Method of Equal-Appearing Intervals and the Likert Method of Summated Ratings.

Thurstone and Chave [1929], in measuring attitudes toward the church, applied psychophysical scaling techniques to the domain of attitude measurement. Assuming unidimensionality of the attitude, a scale was constructed which was assumed to have interval properties. Located along the scale were a series of statements ranging from extremely positive to extremely negative. A respondent's "attitude" was assessed by the scale value of the statements with which she or he would agree.

Two major concerns involved in Thurstone scaling are the amount of time and effort expended in the construction phase, and the assumption that the judges who originally order the statements are able to do so without regard to their own position on the concept being measured. As an alternative that did not include these two Thurstone limitations, Likert [1932] devised his method of summated ratings which he presented

as a faster and equally or more valid and reliable attitude measurement instrument than that of Thurstone.

Likert's original contentions inspired much research comparing the two techniques [Banta, 1961; Edwards and Kenney, 1943; Eysenck and Crown, 1949; Ferguson, 1941; Poppleton and Pilkington, 1964]. Empirical evidence has shown that the Likert method of scoring an attitude scale leads to more reliable results than the Thurstone scoring method [Ferguson, 1941; Likert, 1932]. Less attitude items are needed for the same coefficient of reliability for the Likert scale than are needed for Thurstone [Edwards and Kenney, 1946]. Likert's claim that his method was faster found support in the findings of Barclay and Weaver [1962]. Construction of a Likert scale took 43.2% of the time that was required to construct a Thurstone scale. No research findings reveal any comparison of test-retest reliabilities of the two scales, and empirical comparisons of validity are also lacking.

In a review of studies comparing the Thurstone and Likert techniques, Seiler and Hough [1970] concluded that comparisons of the methods of scale construction are impossible; one can only compare the scales. They also felt that inadequate comparisons have so far been undertaken; the lack of generalizability of these few empirical comparisons leaves Likert's original contentions still untested.

#### Attitudes Toward Psychology

One of the major advantages of Thurstone and Likert scales is their applicability for the measurement of a wide variety of attitude domains. Since these scales are not dependent upon the nature of the attitude object being measured, Likert and Thurstone scales have been

used to measure a variety of attitudes differing in terms of their abstractness, complexity, or salience.

One domain of interest to social psychologists is that of individuals' attitudes toward psychology. It becomes of even greater interest when those individuals whose responses we are measuring are introductory psychology students who comprise the major portion of the research subject pool. The attitudes of these people toward psychology and psychological research can affect their laboratory behaviors and can influence the validity of psychological research within the academic setting. Previous studies have indeed indicated that a wide range of feelings, beliefs, and behavior tendencies exist with respect to psychology in populations of introductory psychology students.

Steininger [1970] found that responses to an attitude-toward-psychology scale became more positive after a one-year course in introductory psychology. This change was greater for the items in her scale which were of a factual nature than for those which represented opinions.

In a measurement of undergraduates' attitudes toward mandatory participation in experimentation, Gustav [1962] found three general orientations: apathy, apprehension, and hostility. She discussed ways in which subjects' having these kinds of feelings can distort experimental findings. However, the subsequent behavior of these subjects was merely inferred from responses to Gustav's sentence completion test.

In measuring the attitudes of undergraduates as a function of experience as subjects, Holmes [1967] found that an extensive amount of experience leads to attitudes being more scientific and valuable. Also, experienced subjects seldom reported attempts to determine the hypotheses of research as compared to subjects with less research experience.

Thus, findings tend to indicate that attitudes toward psychology can be affected by both psychology coursework and by the amount of experience as a subject. Other predispositions of students used as subjects have been discussed as potential confounding variables in psychological research in the academic setting.

### Multitrait-Multimethod Analysis of Attitude Structure

The multitrait-multimethod technique devised by Campbell and Fiske [1959] lends itself to convenient application to the measurement of the three components of the attitude toward psychology by two different methods, Thurstone and Likert. The resultant intercorrelations among the traits (components) and methods (scales) indicate aspects of the convergent and discriminant validity of the traits.

Campbell and Fiske present four criteria by which one can assess construct validity. First, the correlations between the same traits as measured by different methods (the validities) should be statistically significant and of sufficient magnitude to justify further investigation. Secondly, these validities should be greater than the correlations in their same row and column in the heterotrait-heteromethod triangles. This implies that correlations between different measures of the same trait should be more related than are correlations between different traits measured by different methods. A third consideration is that the validities should exceed the values in the heterotrait-monomethod triangles. Correlations between different measures of the same trait should be greater than correlations between different traits measured by the same method. This criterion for discriminant validity allows one to compare, to a relative extent, the degree to which trait or method



variance tends to be the more dominant aspect of one's measures. Finally, a similar pattern of trait intercorrelations should exist across all method blocks, i.e., all of the hetero- and monomethod triangles.

In his study of the three components of attitudes toward the church, Ostrom [1969] used the multitrait-multimethod procedure to analyze responses on Thurstone, Likert, Guttman, and Guilford attitude scales. Two hypotheses were formulated: individuals were predicted to respond more consistently to scales measuring the same component than to those measuring different components. Second, nonverbal responses representing the action component were predicted to correlate more with the verbal (scale) responses measuring the action component than with the measures of the affective and belief components.

Having established a more logical base for his scale development (as compared to Woodmansee and Cook), Ostrom designed scales specifically to measure each of the three components. One group of people wrote the items using an elaboration of the Rosenberg and Hovland definitions of the three components. The definition of the affective component was one of favorable or unfavorable feelings, or "gut reactions." The behavioral component was represented by items that dealt with actions in hypothetical situations. Items representing values, attributes, and nonemotional beliefs comprised the cognitive component. A second group of people classified the items as representing the affective, behavioral, or cognitive component, using the same definitions that the item writers had employed. From those classified items, the scales were constructed by a third group of subjects. A "church activities form," designed to assess the behavioral involvement of the respondents, was included in

the booklet of scales that was administered to a sample of college students.

The findings indicated that reliably different types of evaluations were made to the three kinds of statements representing the three attitude components. This was based upon analysis of the discriminant validity comparisons between the monotrait-heteromethod and heterotrait-heteromethod correlation coefficients. However, comparing the mean monotrait-heteromethod correlation (validity) coefficient for their samples (.624) and the mean of the heterotrait-heteromethod correlations (.588), it appears that there is only a small difference in the percentage of variance that can be attributed to unique determinants; there tended to be aspects of all three components that determined an individual's responses. In comparing the four scales used, a nonsignificant difference was found between the Thurstone and Likert scales in their ability to better measure responses to the three components as compared to the Guttman and Guilford scales; the highest convergent validities in the matrix were those represented by correlations between Likert and Thurstone methods. Additionally, overt behavioral indices tended to correlate higher with the behavioral component. However, the use of a statistical test which required the assumption of independence, and was used with nonindependent data, made this conclusion somewhat questionable. The heterotrait-heteromethod correlations were quite high, indicating little differentiation among the three components. The heterotrait-monomethod correlations were highest for the Likert and Guilford scales, suggesting that there was a great deal of shared variance among the measures using these two scales.

As a summary of the analyses done by Ostrom, it can be stated that he made a somewhat limited demonstration of the discriminant validity of the measures of the three attitudinal components. His comparison of heterotrait-heteromethod and monotrait-heteromethod correlations indicated that different causal factors underlie the responses to the three components. However, it was also pointed out that the magnitude of the differences was rather small. In addition, he demonstrated that subjects could generate and classify items using definitions of the three components.

The second hypothesis, that there would be the highest correlation between the behavioral attitude component and the overt behavioral indices was supported.

There were several limiting factors of the study, as Ostrom pointed out. The selection of attitudes toward the church can be assumed to represent influences which an individual has been exposed to throughout his or her life, and these attitudes are often involved in a complicated, well-structured domain of self, family, and friends. The theoretical and philosophical nature of his attitude object may have precluded its being measured in terms of three components. Attempting to impose a triadic structure on something that is so multifaceted as religion may not be a worthwhile endeavor. Its abstractness and complexity may preclude the possibility of neatly fitting it into the three-component framework. One final factor contributing to Ostrom's findings may have been the homogeneity of his respondent pool. The use of undergraduates may have restricted the range of possible responses and attenuated some of the correlations.

A similar study by Kothandapani [1971] was an extension of Ostrom's original research. The modifications consisted of using a more heterogeneous population (low-income, black females), modifying the behavioral component to a "behavioral intention" component, and using attitudes toward contraceptives as the attitude object. Thus, Kothandapani expected more varied responses than those elicited in the study of religious attitudes by Ostrom.

It was hypothesized that within the multitrait-multimethod framework, an attitude component should correlate higher with itself when measured by two different methods than it would with a different component measured by those same two methods. The second prediction was that the intention-to-act component should be a better predictor of actual contraceptive behavior than the belief or the affective component.

Using basically the same procedure as Ostrom, Kothandapani established the convergent and discriminant validities of the three components. The different responses were made to the items representing the three components of the attitude. In addition, factor analysis of the data revealed three orthogonal factors which accounted for 58% of the total variance (affect--21%, belief--16%, intention to act--21%).

Support for his second hypothesis was derived from the high correlations between the intention-to-act component and the reported use/nonuse of contraceptives. A second test of this hypothesis was done by computing the relative weights of each component for each scaling method; the intention-to-act component was weighted the greatest in discriminating the user from the nonuser. Kothandapani also found that the Thurstone and Guttman methods differentiated the three components

better than did the Guilford and Likert scales. However, he introduced a bias in the Thurstone scale during the construction phase. All items were initially subjected to Thurstone scale construction procedures, and only those items with the lowest Q-values were selected for the final Thurstone scale. The other three scales contained those rejected items with the higher Q-values. This lack of random assignment of items to scales may have had a differential effect on the other scales.

Kothandapani did demonstrate that attitudes toward a controversial issue could be conceived of, classified, and scaled in terms of affect, belief, and intention-to-act components. The larger correlation of the intention-to-act component with the overt behavioral measures supported the legitimacy of distinguishing among attitude components.

Kothandapani not only attempted to establish the validity of the three-component theory of attitude research, but he also looked at the relationships between attitudes and behavior. Much controversy exists concerning the hypothetical relationship between attitudes and behavior, and the as yet equivocal research findings do little to resolve it. The section which follows discusses some aspects of this controversy.

### Attitudes and Behavior

Many studies have investigated the relationship between verbal expressions of attitudes and overt actions directed toward the attitude object, but few have established a clear relationship between attitudes and behavior. Part of the lack of positive correlation between verbal and behavioral responses can be attributed to the methods employed to assess the verbal expressions of attitudes. Other sources of disparity lie in the salience of that attitude to the individual,

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the dimensionality of that attitude, the social constraints operating at the time of measurement, environmental limitations on expressions of behavior, and the instrumentality of the behavior response.

In Wicker's [1969] extensive review of attitudes and actions, he postulated several sources of possible influence on attitude-behavior correlations: personal factors such as other verbal attitudes; competing motives; verbal, intellectual, or social abilities; activity levels; situational factors such as similarity to the situation in which the verbal measure was taken; presence of others; normative pressures; alternative behaviors available; specificity of the attitudinal object, consequences of actions, and extraneous variables. Prediction of overt responses from verbal expressions of attitudes and the reverse should therefore be made quite cautiously. A more realistic approach implies the consideration of the many variables which can exert influence on the relationship.

Fishbein [1967] formulated a model for the prediction of behavioral intentions based upon an adaptation of Dulany's [1967] "theory of propositional control." Fishbein's model expressed behavioral intentions as a joint function of the attitude toward behaving in a particular manner and the normative influence on that behavior, multiplied by the motivation for compliance with these norms. Using this model, Ajzen and Fishbein [1969] combined attitudes and normative beliefs in a multiple regression equation and found that they were accurate predictors of behavioral intentions. In addition, consideration of alternative behaviors that were available to the individual were found to be important considerations in predicting behavioral intentions. However, the

limitations of the model lie in its inability to predict behaviors (only behavioral intentions) and its assumption of ratio scales underlying attitudes and normative beliefs and motivation.

Fishbein and Ajzen [1975] discuss the efficacy of the usual approach to attitudes and behavior. They feel that correlating scale scores with a single act is not a valid conceptualization of the attitude-behavior relationship. A single act is a behavior elicited at one point in time and is subject to the influence of a multitude of external influences, only one of which is the attitude. A multiple-act criterion consists of some combination of various single-act criteria which represent carefully chosen behaviors. This combination then becomes a single representation of a set of behaviors which are assumed to be similar in nature to the generality of the various aspects of the concept "attitude."

Because an attitude is related to some behaviors and not to others, and because it will influence a number of responses that are consistent with it, the use of a multiple-act criterion stacks the behavioral deck in such a way that correlation between an attitude and one of the behaviors will occur. Thus, greater predictive power is achieved when the criterion is composed of multiple acts rather than a unitary act. According to Fishbein and Ajzen, the multiple-act criterion is the only appropriate method of assessing a relationship between attitudes and behaviors and will yield meaningful findings about the attitude-behavior relationship. However, they do not address the issue of how to combine the behavioral criteria in either a theoretically or mathematically valid manner, and the uncertainty associated with different types of



criteria combinations confines their approach to the theoretical domain.

### Research Objectives

Ostrom [1969] and Kothandapani [1971] have provided evidence which suggests that a three-component model of attitude structure can be validated through multitrait-multimethod analysis procedures. The study presented here is intended to provide additional evidence about the substantive base. The Thurstone and Likert scales, which have been subjected to a multitude of comparisons and have tended to be sensitive to the measurement of the three components, will serve as the measurement devices.

The external behavioral criteria for this study consist of self-report data, based on responses to seven questions. These seven behaviors are, on an a priori notion, presumed to represent behaviors consistent with a strong interest in psychology. These measures thus serve as seven potential criteria for evaluating the predictive power of the attitude scales, particularly the intention to act scale. Specifically, these behaviors are 1) the number of psychology courses that the student has had; 2) the number of experiments in which the student has participated; 3) the percentage of class attendance; 4) the percentage of reading assignments that have been read; 5) the grade on the first exam; 6) the expected course grade (final grade); 7) plans to take more psychology courses.

### Hypotheses

The hypotheses under investigation in this study are as follows:

1) In the context of the multitrait-multimethod approach, the intercorrelations of measures of one attitude component by the Thurstone

and Likert scales should be greater than the intercorrelations among the three attitude components measured by the same scale.

2) If the behavioral intention component of the attitude is a valid predictor of overt behavior, then that component should correlate the highest of the three components with the seven external behavioral measures.

## METHOD

### Construction of Items

Ten psychology graduate students at Michigan State University served as item writers. The students were instructed to write ten statements representing each of the three attitude components. They were given modified versions of the Rosenberg and Hovland [1960] definitions similar to those used by Kothandapani [1971] (see Appendix A). This procedure yielded an item pool of 300 items, with 100 representing each of the three components.

### Classification of Items

Item classifiers were 120 male and female undergraduates who were enrolled in introductory psychology classes and participated for experimental credit.

Using the same definitions employed by the item writers, the students classified the items as representing feeling, belief, or intention to act. They received an instruction sheet with definitions and examples to assist them (see Appendix B). Each student classified a randomized set of half of the item pool. Thus, each of the 300 items were classified by 60 students, and those items agreed upon as representing the same component by 75% or 45 of the students were retained. As a result of this procedure, 83, 90 and 76 items were selected to represent feeling, belief, and intention to act components, respectively. From these three pools of items, 35 items were randomly selected to

represent each of the three components for the Thurstone scales, and 35 were selected for each of the three Likert scales.

### Thurstone Scale Construction

Eighty-one male and female undergraduate students enrolled in introductory psychology classes participated in the construction of the Thurstone scales. They received experimental credit for their participation.

Using the standard procedure for construction of a Thurstone Equal-Appearing Interval Scale [see Thurstone and Chave, 1929], students separately sorted the three sets of items into 11 categories representing a range along the attitude continuum from extremely negative to extremely positive. They were furnished with an instruction sheet which gave them verbal anchors for their 11-point continuum (see Appendix C). From their sorts, the 19 items with the lowest Q-values and a fairly wide range of scale values were retained for each of the three Thurstone scales. The range of the Q-values and scale values for the feeling, belief and intention to act scales can be found in Table 1.

Table 1. Thurstone Scales

Component	Range of Q-Values	Range of Scale Values
Feeling	.79 to 2.69	2.02 to 9.16
Belief	1.46 to 2.45	1.89 to 9.59
Intent to Act	1.55 to 2.98	2.15 to 9.02

### Likert Scale Construction

Seventy-five male and female undergraduate students enrolled in introductory psychology classes participated in the construction of the Likert scales. They received experimental credit for their participation.

The three sets of 35-item Likert scales were combined to form one 105-item scale. The response categories consisted of Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. These scales were group administered to the students, and their responses were analyzed separately for the three scales in order to refine them for final administration.

The 19 items with the best discriminating power i.e., highest  $\underline{t}$ -values, the highest adjusted item-total correlations for each scale were retained. The reliabilities, ranges of the  $\underline{t}$ 's, and the adjusted  $\underline{r}_{it}$ 's for the feeling, belief, and intention to act can be found in Table 2.

Table 2. Likert Scales

Component	Reliability (Alpha)	Adjusted $\underline{r}_{it}$	Range of $\underline{t}$ -values of Items
Feeling	.910	.593	3.36 to 7.91
Belief	.912	.603	2.97 to 7.02
Intent to Act	.916	.605	3.64 to 8.18

Note:  $\underline{r}_{it}$  = Average adjusted item-total correlation.

### Administration of Final Scales

Subjects. Eighty male and 120 female undergraduate students enrolled in introductory psychology classes responded to the revised Likert and Thurstone scales. They received experimental credit.

Materials. The scale booklet, (see Appendix D) which was administered to each subject in group settings, consisted of an instruction page, the three Likert scales, the three Thurstone scales, and a page of behavioral measures. The order of the six scales was randomized within each method block, and the two method blocks were randomly alternated within the scale booklet. The behavioral measures were always at the end.

Procedure. Scale booklets were administered in large group settings.

## RESULTS

### Characteristics of the Scales

The means, standard deviations, and coefficient alpha index of reliability for the three Likert scales and the medians, interquartile deviations and split-half reliabilities for the three Thurstone scales are presented in Table 3. Thurstone reliabilities were computed from two nine-item splits; these splits were composed of items of comparable scale values. The nineteenth item (highest scale value) was deleted to maintain equal halves. These two halves were then correlated, and the correlation was adjusted by the Spearman-Brown formula. These data are obtained from the final sample of 200 individuals and hence differ from those presented in Tables 1 and 2 based on different samples.

Comparing across methods, it appears that the Likert method of measurement yields more reliable instruments. With the same number of items (19), the Likert scales had reliabilities greater than .85, while the Thurstone reliabilities ranged from .59 to .63. Within methods, there tend to be no great differences among the three trait measures.

### Multitrait-Multimethod Matrix

The computation of intercorrelations among the feeling, belief, and intention to act components as measured by the Likert and Thurstone scales yielded a six by six multitrait-multimethod matrix. The matrix is presented in Table 4. Within this matrix, four aspects of convergent and discriminant validity were assessed using the Campbell and Fiske [1959] criteria.

Table 3. Characteristics of the Scales

Likert			
Scale	Mean	Standard Deviation	Reliability (Alpha)
Feeling	3.82	.48	.895
Belief	3.89	.40	.859
Intent to Act	3.55	.53	.899

  

Thurstone			
Scale	Median	Interquartile Deviation	Reliability (Split)
Feeling	8.31	.28	.616
Belief	8.33	.53	.590
Intent to Act	8.15	.22	.633

Table 4. Multitrait-Multimethod Matrix

	Likert			Thurstone		
	Feeling	Belief	Intent	Feeling	Belief	Intent
<b>Likert</b>						
Feeling	.895					
Belief	(.682)	.859				
Intent	(.662)	(.543)	.899			
<b>Thurstone</b>						
Feeling	/.498/	<u>.427</u>	<u>.383</u>	.616		
Belief	<u>.476</u>	/.591/	<u>.382</u>	(.684)	.590	
Intent	<u>.383</u>	<u>.382</u>	/.448/	(.520)	(.489)	.633

Note: Unmarked values in the main diagonal are the reliabilities. Values enclosed in slashes are the validities. Underlined values represent the heterotrait-heteromethod correlations, and the parenthesized values are the heterotrait-monomethod values. N=200.



First, the criterion for convergent validity is that the correlation in the validity diagonal must be significantly different from zero and of sufficient magnitude to warrant further consideration. For the three traits, this criterion is met to some extent. All correlations are significantly different from zero at probability levels less than .05, but the magnitudes of the values (.498, .591, and .448) are somewhat lower than is desired.

Second, each of the validity correlations should be greater than the correlations in each of their respective rows and columns of the heterotrait-heteromethod triangles. Different methods of measuring the same trait should correlate higher than do measures of different traits measured by different methods. This criterion for discriminant validity is met in this matrix for the three traits, although the magnitudes of the differences are small.

The third consideration involves comparisons of the values in the validity diagonal with the values in the heterotrait-monomethod triangles; the values in the validity diagonal should be greater than those correlations among different traits which are measured by the same method. This was the first hypothesis and failed to be supported since all but two of the heterotrait-monomethod correlations exceed the validities. Thus, common method appears to be more dominant than common trait.

One final aspect of discriminant validity lies in the comparison among the four heterotrait triangles. The same pattern of trait interrelationships is supposed to exist in both the hetero- and monomethod blocks. This criterion is met in one respect: the heterotrait-monomethod correlations exceed the heterotrait-heteromethod correlations,

but the relative sizes of the various heterotrait correlations indicate that a similar pattern is present; the highest correlations are between feeling and belief, and the lowest are between belief and intent to act. These patterns are similar across method blocks.

#### Principle Components Analysis of the Likert Scales

In order to further examine the underlying dimensions of the Likert responses, a principle components factor analysis with Varimax rotation was done on the combined Likert scales (57 variables). The thirteen factors which were originally extracted accounted for 64% of the total variance. However, these thirteen factors were uninterpretable in terms of content, and a more meaningful four-factor solution was chosen. This four-factor solution was preferred over the original 13 factors because of a noticeable drop in the variance accounted for between the fourth and fifth factors. The factor loadings, eigenvalues, percentage of variance accounted for, and the communalities for this four-factor solution are presented in Table 5. These four factors accounted for 42.3% of the total variance and were considered explainable in terms of the components originally posited.

The obtained factor structure was not exactly as hypothesized, but furnished separate dimensions which were interpretable based on factor loadings greater than .30. Approximately one-half (eight) of the feeling items loaded most highly on Factor 1. This factor appeared to be an "interest in psychology" dimension and consisted of items such as ". . . psychology bores me," "psychology is fun to study," and "psychology classes are enjoyable." An equal amount of feeling items loaded on Factor 2. These items differed from items of Factor 1 in that they

Table 5. Varimax-Rotated Factor Matrix for the 57 Likert Variables

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Communality
01	<u>.63</u>	.20	.35	.17	.58
02	<u>.40</u>	.36	.07	.24	.35
03	.19	.37	-.03	<u>.38</u>	.32
04	.08	<u>.54</u>	-.04	.28	.37
05	<u>.43</u>	.17	.10	.26	.29
06	<u>.27</u>	.18	.34	<u>.39</u>	.36
07	<u>.75</u>	.08	.28	.18	.68
08	.26	.31	<u>.51</u>	.14	.44
09	-.00	<u>.70</u>	-.02	.10	.50
10	.04	<u>.71</u>	.10	.01	.52
11	<u>.75</u>	.28	.11	.15	.68
12	<u>.62</u>	.16	.32	.03	.51
13	.16	<u>.56</u>	.18	-.01	.38
14	.03	<u>.65</u>	.08	.13	.45
15	.25	<u>.71</u>	.09	.10	.58
16	<u>.67</u>	.26	.21	.07	.57
17	.48	<u>.52</u>	.11	.15	.53
18	.16	<u>.54</u>	.19	.04	.35
19	<u>.65</u>	.20	.41	.12	.65
20	.29	.14	.23	<u>.43</u>	.35
21	-.07	.25	.11	<u>.45</u>	.28
22	.34	<u>.39</u>	-.00	.16	.29
23	.08	.11	.15	<u>.55</u>	.35
24	.30	.25	-.06	<u>.37</u>	.29
25	-.04	.11	.19	<u>.62</u>	.44
26	.27	.28	.10	<u>.53</u>	.45
27	.28	.34	.09	<u>.51</u>	.46
28	.20	.05	.19	<u>.58</u>	.42
29	.27	.18	.02	<u>.58</u>	.48
30	.24	.06	.10	<u>.53</u>	.35
31	.28	.18	.03	<u>.35</u>	.23
32	-.14	-.08	.15	<u>.45</u>	.25
33	.16	.03	.12	<u>.52</u>	.31
34	.13	<u>.49</u>	.15	.28	.35
35	-.02	<u>.38</u>	.30	.29	.32
36	.12	<u>.54</u>	.12	.34	.44
37	.27	<u>.27</u>	.23	<u>.43</u>	.38
38	.02	.11	-.05	.55	.32
39	<u>.54</u>	.01	.44	.18	.52
40	.08	.18	<u>.45</u>	.24	.30
41	.11	.06	<u>.63</u>	.25	.47
42	<u>.59</u>	.02	<u>.34</u>	.24	.52
43	<u>.54</u>	-.06	<u>.56</u>	.12	.63
44	.39	-.04	<u>.55</u>	-.07	.46

Table 5. (Cont'd.)

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Communality
45	.12	.08	<u>.63</u>	.21	.46
46	.11	-.07	<u>.67</u>	.05	.47
47	.43	-.13	<u>.50</u>	.06	.46
48	-.02	.18	<u>.54</u>	-.10	.33
49	.19	.21	<u>.44</u>	.23	.33
50	.29	.01	<u>.58</u>	.18	.45
51	.42	-.08	<u>.56</u>	.20	.53
52	<u>.54</u>	.10	<u>.51</u>	.15	.58
53	.19	.38	<u>.52</u>	.09	.46
54	.14	.11	<u>.43</u>	.03	.21
55	.13	.27	<u>.50</u>	.24	.39
56	.22	.39	<u>.48</u>	.10	.44
57	.15	<u>.30</u>	<u>.23</u>	.25	.22
Eigenvalue	15.21	4.20	2.60	2.10	
Percentage of Variance	26.7	7.4	4.6	3.7	

Note: The first 19 items are Feeling; the second 19 are Belief; and the third set of 19 items represents Intent to Act.

reflected a general attitude toward experimentation or strictly the research aspect of psychology. Examples of items whose highest loadings were on that factor are "psychology experiments seems really horrible. . .," "I am annoyed by the current poor treatment of subjects in psychology experiments," and "I feel like a guinea pig when I participate in psychology experiments." Fifteen of the 19 belief items loaded in Factor 4, and thus this factor was interpreted as representing a belief or cognitive dimension. Fifteen of the 19 intent to act items loaded most highly on Factor 3 and comprised a dimension relating to behavior.

It thus appeared that certain aspects of the tripartite distinction

emerged in the factor analytic solution. Even in spite of the lack of discriminant validity, as defined by the multitrait-multimethod criteria, some semblance of the three-component structure was discernible.

On the basis of this factor analytic solution, the four factors were used to define four emergent scales. The assignment of variables to scales was based on factor loadings which exceeded .30. The four scales which were comprised of those variables which loaded the highest on the four factors were then reanalyzed in order to compare their characteristics with the original Likert scales and to determine if this approach yielded scales of better quality. The comparison data are presented in Table 6.

Table 6. Comparisons of Original Likert Scales and Factor Analytically Defined Scales

Scale	Number of Items	Reliability	Average Adjusted $\bar{r}_{it}$
Feeling	19	.895	.593
Belief	19	.859	.542
Intent	19	.899	.600
Factor 1	11	.903	.661
Factor 2	13	.843	.511
Factor 3	16	.882	.538
Factor 4	17	.848	.468

Note: Reliability index was coefficient alpha.  
 $\bar{r}_{it}$  = item-total correlation.

The four new scales do not seem to be a great improvement over the original scales. Their item-total correlations are similar to the original scales, but they do tend to have equal or better reliabilities with a smaller number of items. This indicates that these new scales are somewhat more internally consistent. If the reliability, which is a positive function of the number of items in a scale, increases when you delete items, then that increase can be attributed to greater internal consistency among the smaller number of items. However, as previously stated, there are no major differences in these new scales from the original. This is not surprising since many of the same items were contained in the new scales, especially for belief and intent to act. It therefore appears that either approach yields somewhat comparable scales, and the factor analytic solution to a large extent bolstered the a priori basis for scale formations in terms of the three components.

#### Correlation with Behavioral Measures

In order to test the hypothesis that the behavioral intention component would correlate the highest with the behavioral measures, the responses to the seven behavioral measures were correlated with each of the six attitude scales. These correlations are presented in Table 7.

With respect to the first behavioral criterion, that of having taken previous psychology courses, the Likert Intent to Act scale correlated .282, the highest among all six measures. All Thurstone scales were negatively correlated with the criterion.

Table 7. Correlations Between Scale Scores and Behavioral Measures

	Had Psych Courses	Number of Exper.	% Class	% Rdg.	Test Grade	Exp. Grade	Take Courses
L <sub>f</sub>	.107	.046	.054	.213	.148	.076	.240
L <sub>b</sub>	.027	-.071	.046	.186	.143	.052	.196
L <sub>i</sub>	.282	.140	.060	.166	.140	.076	.446
T <sub>f</sub>	-.023	-.010	.112	.157	.134	.082	.151
T <sub>b</sub>	-.075	-.119	.013	.088	.120	.083	.140
T <sub>i</sub>	-.040	-.069	.159	.263	.087	.023	.183

Note: L<sub>f</sub>, L<sub>b</sub>, and L<sub>i</sub> represent the Likert Feeling, Belief, and Intent to Act scales. T<sub>f</sub>, T<sub>b</sub>, and T<sub>i</sub> represent the Thurstone Feeling, Belief, and Intent to Act scales.

The number of psychology experiments in which the subjects participated correlated the highest with the Likert Intent to Act Scale, .140. Although this is significant ( $p < .05$ ), its magnitude is quite small. Again, the Thurstone measures were negatively correlated with the criterion.

The percentage of class attendance had little relationship to any of the Likert scales, but did correlate .159 with the Thurstone Intent to Act scale. Although this was the highest scale correlation, it is too small to be of practical importance.

The Thurstone Intent to Act scale correlated the highest with the percentage of reading assignments. This correlation of .263 was followed by the correlation between the criterion and the Likert Feeling scale, .213. The Likert Intent to Act only correlated .166.

None of the scales correlated very well with test grade. The highest was the Likert Feeling scale, which correlated .148 with test grade. However, it was not very different than the correlations of .143

and .140 for Likert Belief and Intent, respectively. The Thurstone Intent to Act had the lowest correlation of all six scales and correlated .087 with the criterion.

With respect to expected course grade, none of the scales had a significant relationship to the criterion. All were uniformly low and ranged from .023 (Thurstone Intent to Act) to .083 (Thurstone Belief).

The final behavioral measure was whether or not the subject planned to take more psychology courses. The Likert Intent to Act scale correlated .446 with this criterion and was the highest correlation that was obtained over all seven behavioral measures. The Likert Feeling scale correlated .240, and the Thurstone Intent to Act scale correlated .183.

For all seven behavioral measures, five of the seven highest correlations were between the Likert (3) or the Thurstone (2) Intent to Act scales. However at no time were both Intent to Act scales relatively equivalent in their relationships with the criteria. There is somewhat partial confirmation of the second hypothesis, that the intent to act scales would correlate the highest with the behavioral measures. On an absolute level, five of the seven highest correlations were with intent to act scales, but the size of some are of little practical significance. Moreover the correlations tend to be scale specific and not component specific. If the correlations between both Intent to Act scales and the various behavioral criteria would have been consistently the highest correlations, then the hypothesis would have been more fully supported.



### Comparisons Among Three Multitrait-Multimethod Studies

Since the Ostrom [1969] and Kothandapani [1971] multitrait-multimethod studies served as the base for the present research, there is a need to compare the findings across all three studies in an objective, quantifiable manner. Citing conclusions from these studies which were based on the Campbell and Fiske [1959] criteria furnishes no basis for comparison among them, since those conclusions were based on relative comparisons within each matrix, and thus are not absolute. Furthermore, even comparing the magnitudes of the various correlations across studies is not meaningful since all the correlations have different standard errors.

Kavanagh, MacKinney, and Wolins [1975] used an analysis of variance technique for decomposing a multitrait-multimethod matrix into four sources of variance: 1) subject variance, which indicates the degree of response agreement over traits and methods, or the degree of convergent validity; 2) subject by trait variance, indicating the degree of discriminant validity or the degree to which subjects can differentiate among the three traits; 3) subject by method variance, or the degree to which "halo" (method bias) affects measurements; and 4) error. These variance components are computed by considering the multitrait-multimethod matrix as a three-way factorial, using three sources of covariance: 1) within method across traits; 2) within trait across methods; and 3) across both traits and methods. This then allows one to assess convergent validity, discriminant validity, and halo effects, quantitatively, using these three sources of covariation.

The analysis of variance of the correlations from the Ostrom, Kothandapani, and present studies were computed, using only the Thurstone and Likert methods from the first two studies. The summary table for the three studies is presented in Table 8.

Table 8. Analysis of Variance of Correlations from the Ostrom, Kothandapani, and Present Studies

Source	df	MS	F	Variance Component*
Ostrom				
Subjects	188	4.4467	17.12	.698
Subjects x Trait	376	.3402	1.31	.040
Subjects x Method	188	.3854	1.48	.042
Error	376	.2597		.260
Kothandapani				
Subjects	99	2.6703	12.99	.411
Subjects x Trait	198	.9730	4.735	.384
Subjects x Method	99	1.0330	5.027	.276
Error	198	.205		.206
Present Study				
Subjects	199	3.5340	11.86	.539
Subjects x Trait	398	.5131	1.72	.108
Subjects x Method	199	.8750	2.94	.192
Error	398	.2980		.298

Note: All  $F$ 's are significant at  $p < .001$ .

\*Intraclass Correlation Coefficient

The results of the significance tests on the main effect and interactions indicate that all are significant ( $p < .001$ ). Although the  $F$ -ratios are significant, the magnitudes of some are quite small. Due to large degrees of freedom, even trivial differences will be statistically significant.

Within all three studies, convergent validity appears to be quite strong. However, Kothandapani's results are the only ones who show adequate discriminant validity. Moreover, the magnitude of the error variance is greater than the effect for subjects x trait or subjects x method in both the present study and that of Ostrom's. This implies that ratings may be more influenced by unknown variance sources than they are by any of the designated sources, thereby reducing practical significance of the findings.

Since these variance components allow for comparisons within studies, but not across, an index for comparing across studies is necessary. Since all three studies have different error variances, dividing true variance by true plus error furnishes an absolute index with which to compare matrices. These indices are presented in Table 9 for the subjects, subjects x traits, and the subjects x methods sources of variance for all three studies.

Table 9. Indices for Comparisons Across Studies

Source	Ostrom	Kothandapani	Present Study
Subjects	.729	.670	.644
Subjects x Trait	.134	.651	.266
Subjects x Method	.139	.573	.392

On the basis of the data in Table 9, it is apparent that, with respect to each other, all three studies have obtained comparable amounts of convergent validity. However, both the Ostrom and present study fall short of obtaining the degree of discriminant validity of Kothandapani, as illustrated by the difference among the three subject

x trait indices. In spite of the high discriminant validity, Kothandapani's findings contain a high degree of method bias (subjects x methods). His value of .573 far exceeded that of the present study (.392) or that of Ostrom's (.139).

There appear to be little differences among the three studies with respect to convergent validity. However, Kothandapani's matrix possessed the highest degree of discriminant validity (.651) of all three studies, and that of Ostrom's was extremely small (.134). Kothandapani most strongly established the construct validity of his three components by having high and equal amounts of both convergent and discriminant validity. Kothandapani's matrix also possessed the most method bias, which is unusual in the light of his high discriminant validity. The fact that Ostrom's method bias is so low (.139) along with his discriminant validity (.134) indicate that there are more unknown sources of variance operating in his matrix. The present study fell somewhat in between the other two. Its discriminant validity, although low, was not as low as Ostrom's, and the method bias was not as extreme as Kothandapani's. It possessed the least convergent validity of all three, but their relative closeness made this difference somewhat trivial.

## DISCUSSION

The present research did not completely support the existence of three separate components of the attitude toward psychology. The results of the multitrait-multimethod analyses indicated that there was evidence for convergent validity, but the criteria for discriminant validity were not completely met. Correlations among the same scales were greater than correlations among the same traits. Secondly, the predictive power of the behavioral intention component was found to be rather weak.

One problem may have been in the quality of the measurement devices, particularly the Thurstone measures. The poor reliability of all three Thurstone scales and the uneven distribution of scale values across the 11-point continuum may have served to attenuate the relationships. Moreover, the appearance of three components in the factor analysis of the Likert data suggests that the triadic structure may exist, but did not exhibit itself in terms of the multitrait-multimethod analysis; perhaps due to the poor quality of the Thurstone scales.

There were several problems associated with the behavioral criteria. Ideally, unobtrusive measures of various behaviors or use of archival data would be the most valid behavioral criteria. However, ethical considerations dictated that we rely solely on self-report measures of behavior. The validity of these kind of data is usually low, and the responses are influenced by a number of extraneous variables (social desirability, fatigue, motivation, attitudes toward psychology

experiments, and objectivity of the respondent). Secondly, these criteria were appended to the attitude scale booklet and were similar in format to the actual scales. This simultaneous measurement and questionnaire aspect of the behavioral measures may have induced a feeling of hypotheticalness to their assessment. Thus, subjects were influenced more by their own orientations than actually objectively responding to the questions as independent behavioral measures. A third consideration lies in the nature of the criteria themselves. The first criterion, that of previous psychology courses, was inappropriate for use with introductory psychology students. The restriction of range would only serve to attenuate the correlations. The criterion of "expected grade" was not really a behavior and required subjects to give a prediction (or a wish) about their grade. The last criterion, that of plans to take more psychology courses, was actually an intention and not a behavior. In spite of that, it still failed to correlate with either Intent to Act scales.

Another problem lies in the conceptualization of the nature of the predictor-criterion relationship. In this study, does it appear that the attitude toward psychology leads to certain behaviors, or are these behaviors influenced by other academically related attitudes? Moreover, does engaging in these various behaviors lead to an enhancement of attitudes toward psychology? If so, then the predictor-criterion of relationship would be reversed. If there is some sort of a feedback relationship between the behaviors and attitudes, then statements concerning the prediction of one from the other would not be as meaningful. With respect to introductory psychology students,

who may just be beginning to form attitudes about psychology, they may be very susceptible to experiences relating to their instructor, the exams, performance, and class climate. These may be more important sources of influence for attitude formation, rather than the nature of psychology itself. Some of the measures in this study which were considered behavioral criteria may actually be important sources of influence on attitude, rather than the reverse.

Comparisons among the studies by Ostrom, Kothandapani, and the present author indicated that although the three-component approach had convergent validity, discriminant validity was lacking in both the Ostrom and present study. This lack of differentiation among components for two out of the three studies suggests that perhaps the distinction among them is not operationalizable for some attitudes. These comparisons also indicated that use of the Campbell and Fiske [1959] criteria as basis for comparisons across studies is not very meaningful. The use of a quantified, absolute index allows inter-matrix comparisons and objective assessments of convergent and discriminant validity as well as method bias. It was also apparent from these comparisons that there was a great deal of method bias operating on the Kothandapani study, but little on the Ostrom study. There was a moderate amount in the present study which was coupled with a lack of discriminant validity. Thus, with respect to the Ostrom and present study, if discriminant validity is an important part of construct validation, then the lack of it within the two studies indicates that there is little point in differentiating among three attitude components. In Ostrom's matrix, a lot of variance seems to be due to unknown

sources (since both discriminant validity and method bias are low), but for the present study, much of it can be attributed to a method bias. With respect to Kothandapani, there seemed to be only a slight influence from unknown sources operating within his matrix. His high indices for convergent and discriminant validity as well as method bias indicate that these known sources account for most of the variance.

These comparisons lead to the question of why Kothandapani was able to establish both the convergent and discriminant validity of the three components, and the Ostrom and present study failed to do so. One possible explanation may lie in the nature of the attitude objects themselves. The nature of the attitude object selected for study by Kothandapani was that of contraceptives, very specific and concrete. It differed substantially from that of attitude toward religion (Ostrom) or that of attitudes toward psychology. The latter two attitude objects differ from contraceptives in terms of social relevance, dimensionality, and utility. Kothandapani's attitude object and those of Ostrom and the present author can be viewed as representing two general types of attitudes: one being concrete and readily defined; the other being abstract, diffuse, and multifaceted. The many dimensions of the attitude toward religion and attitude toward psychology may complicate the triadic nature and preclude their being measured in the strict three-component format that was imposed upon them.

Another possible explanation for why the triadic structure did not manifest itself in these measures is that there may be a high degree of consistency among them. Even if the three-component structure does exist, the strong interrelationships among them and subsequent pressures



toward maintaining consistency can preclude the possibility of obtaining different responses to the three different scales. Given consistency among them, at one point in time, three measures of the affective, belief, and behavioral intention components will yield similar response patterns. Hence, from a measurement point of view, it becomes impossible to separately assess the contributions of the three components to the total attitude.

The use of introductory psychology students, with their level of familiarity with psychology, may have restricted the variance of the responses. They may have tended to respond in a general "good-bad" manner and ignore the various aspects of psychology. Perhaps they were asked to make discriminations or distinctions that were beyond their level of familiarity with psychology. The use of psychology majors at higher undergraduate levels, who are presumably more knowledgeable about psychology and more cognizant of its multifacetedness may give a much different pattern of results. Kothandapani obtained his results from females who either themselves used contraceptives, or were very much familiar with them from their interactions with various family planning agencies.

Future endeavors must take into account the specific nature of the attitude which they are investigating, the level of familiarity of the respondents with the attitude object, and the quality of the measurement devices. The approach to attitude measurement in terms of three components may not be feasible in all attitude domains. The use of this approach to measure a multifaceted concept is likely to yield three parallel measures of the general "goodness-badness" of an attitude

object. This study is not meant to dismiss the validity of the three-component approach; instead, it should be interpreted as providing evidence for a more conditional approach to that theory. Specifically, the dimensions of the attitude object, its abstractness, and the knowledge of the respondents with respect to that object, along with the quality of the measurement devices are parameters which can directly or indirectly influence the nature of the findings. Therefore, decisions to utilize this tripartite approach must be tempered by careful consideration of the previously mentioned points.

It appears that the tripartite theory of attitude structure is not an all encompassing one. The existence of separate feeling, belief, and behavior components of an attitude may be restricted to specific types of attitude domains. This implies that general theories of attitude structure may be forced to become less general, and a new class of theories may develop which are attuned to the differential characteristics of various attitudes.

## APPENDICES

## APPENDIX A

### INSTRUCTIONS FOR WRITING ATTITUDE SCALE ITEMS

Statements expressing feeling, beliefs, and intentions to act are all attitudinal statements. The whole or global concept of attitude can be considered in terms of three components: Feeling, Belief, and Intention to Act.

Your task is to write items or statements of attitudes toward psychology and psychological research which would represent each of the three components.

In order to avoid any ambiguity as to the meanings of the words "feeling," "belief," and "intention to act," please read the following definitions and examples of each component:

#### FEELING COMPONENT

These statements represent feelings ranging from favorable to unfavorable toward psychology and psychological research. They express sentiments of liking and disliking, emotional reactions, or "gut" reactions.

Examples: I am happy to hear of the benefits of psychological research.

The very thought of a psychology experiment disgusts me.

#### BELIEF COMPONENT

These statements reflect values and attributes assigned to the concept of psychology. They include beliefs and opinions about the characteristics of psychology and research, and the relationship of

psychology to other objects, including oneself, and to other values.

Examples: Psychology will aid us in understanding human behaviors.

I believe that psychology abuses the concept of individualism.

#### INTENTION TO ACT COMPONENT

This component contains statements which represent actions directed toward psychology and psychological research and behaviors in hypothetical situations. The items should refer to behavior or some preferred course of action.

Examples: I would volunteer to participate in psychology experiments.

I would try to take as many psychology courses as my schedule could accomodate.

Your task is to write ten attitude scale items for each of the three components. Included are some essay-type responses from undergraduates which indicate their feelings about psychology and psychological research that are out of their domain of experience.

In writing your items, remember that you are dealing with two separate issues: attitudes toward psychology, and attitudes toward psychological research or experimentation. Don't combine these two issues in any one statement. Write items dealing with only one issue. Try to keep the statements in moderate length and avoid double-barreled statements (two ideas in one sentence), or statements with double negatives (e.g., I do not believe that nonparticipation in experiments is. . .). Specify which statements represent which of the three components.

## APPENDIX B

### INSTRUCTIONS FOR CLASSIFYING ATTITUDE STATEMENTS

Statements expressing feelings, beliefs, and intentions to act are all attitude statements. The whole or global concept of attitude can be considered in terms of three parts or components: Feeling, Belief, and Intention to Act.

Your task is to classify items of statements of attitudes toward psychology and psychological research into those categories that represent each of the three components mentioned above.

In order to avoid any ambiguity as to the meanings of the words "feeling," "belief," and "intention to act," please read the following definitions and examples of each component:

#### FEELING COMPONENT

These statements represent feelings ranging from favorable to unfavorable toward psychology and psychological research. They express sentiments of liking and disliking, emotional reactions, or "gut" reactions.

Examples: I am very happy to hear of the benefits of psychological research.

The very thought of a psychology experiment disgusts me.

#### BELIEF COMPONENT

These statements reflect values and attributes assigned to the concept of psychology. They include beliefs and opinions about the characteristics of psychology and research, and the relationship of

psychology to other objects, including oneself, and to other values.

Examples: Psychology will aid us in understanding human behavior.

I believe that psychology abuses the concept of individualism.

INTENTION TO ACT COMPONENT

These statements represent actions directed toward psychology and psychological research, and behaviors in hypothetical situations.

The items should refer to behavior or to some preferred course of action.

Examples: I would volunteer to participate in psychology experiments.

I would try to schedule as many psychology courses as my schedule could accomodate.

## APPENDIX C

### INSTRUCTIONS FOR SCALING ATTITUDE STATEMENTS

We are trying to construct attitude scales to measure attitudes toward psychology and psychological research. When these attitude scales are constructed, they will be used to assess the attitudes of students in order to know more about what they think about psychology. To construct these scales, your cooperation is greatly needed.

In your envelope, you will find a packet of index cards numbered from 1 to 11, and 11 rubber bands. You are to place these 11 cards in front of you on the table. You will also be given a stack of statements on 3 x 5 index cards. Your task is to read each statement carefully; then decide whether the statement is favorable or unfavorable to psychology and psychological research. We are not interested in whether or not you agree with the statement. We merely want you to act as a judge to determine if it is favorable or unfavorable toward psychology.

Once you have decided whether the statement is favorable or unfavorable, you are to decide how favorable it is, or how unfavorable it is. To do this, we will have you use this simple method:

You have the 11 cards separated in front of you. Card #11 represents the extremely favorable statements. Card #1 represents the extremely unfavorable statements. Card #6 represents the neutral statements. Place the statement card under card #11 if the statement seems to be extremely favorable toward psychology and psychological



research. Place the statement under card #1 if it seems to be extremely unfavorable. Likewise, place it under #6 if it seems neutral. You are also to place statements under #7, #8, #9, #10, depending on the amount of favorableness. Naturally, a statement given a 9 would be more favorable than a statement placed under card #7. Considering unfavorable statements, a statement given a 1 would be more unfavorable than a statement give a 3. A statement given a 5 would be just slightly unfavorable, but not as unfavorable as the statement given the 3. It may be useful to picture the continuum in the following manner:

1	2	3	4	5	6	7	8	9	10	11
Extremely Unfavorable					Neutral				Extremely Favorable	

Where: 1 = Extremely unfavorable  
 2 = Very unfavorable  
 3 = Unfavorable  
 4 = Moderately unfavorable  
 5 = Slightly unfavorable  
 6 = Neutral  
 7 = Slightly favorable  
 8 = Moderately favorable  
 9 = Favorable  
 10 = Very favorable  
 11 = Extremely favorable

Please remember that we do not want to know whether you agree with a statement or not, or what your own opinion is about psychology. We merely want you to help us sort the statements according to the amount of favorableness or unfavorableness that each one has.

Please take your time and be very careful in sorting. If you have any questions, feel free to ask. You may refer to this instruction sheet at any time during the course of your task.

Thank you for your cooperation.

## APPENDIX D

### ATTITUDE SURVEY

This survey consists of a set of questionnaires designed to see what your attitudes about psychology and psychological research are. There are no right or wrong answers to the questionnaire statements; only your opinion is desired.

The instructions for filling out the pages are found at the top of each page. Note that not all of the instructions are the same, so try to read them carefully. Please fill out each page in the order that it is stapled in this booklet. Answer all of the statements and be as honest as you can in responding.

Thank you very much for your cooperation!

**INSTRUCTIONS:** Below you will find a list of statements about psychology. Under each statement, circle the response that is closest to your own opinion:

SA = Strongly Agree: A = Agree: N = Neither Agree nor Disagree:  
D = Disagree: SD = Strongly Disagree

The study of psychology bores me. SA A N D SD

I dislike the rigid ways that psychology forces us to look at human behavior. SA A N D SD

I usually feel as though I am being deceived when I participate in psychology experiments. SA A N D SD

I dislike experiments because experimenters usually treat me discourteously or coldly. SA A N D SD

It makes me mad when people use psychological explanations for everyday behavior. SA A N D SD

I feel good about contributing to psychologists' knowledge about human behavior when I participate as a subject in an experiment. SA A N D SD

Psychology classes are enjoyable to me. SA A N D SD

I like being a subject in a psychology experiment. SA A N D SD

I think it is disgusting how an experimenter treats me as just "another subject" rather than as an individual. SA A N D SD

I am annoyed by the current poor treatment of subjects in psychology experiments. SA A N D SD

I get annoyed listening to all that garbage in psychology class. SA A N D SD

Psychology fascinates me. SA A N D SD

I don't like psychologists because I can't stand the feeling that I'm being watched. SA A N D SD

It makes me mad to see that people are treated like nonhuman robots in some psychological research. SA A N D SD

Psychology experiments seem really horrible to me. SA A N D SD

I am often bored by psychology. SA A N D SD

The things I learn in psychology class nauseate me. SA A N D SD

I feel like a guinea pig when I participate in psychology experiments. SA A N D SD

I feel psychology is fun to study. SA A N D SD

INSTRUCTIONS: Below you will find a list of statements about psychology. Under each statement, circle the response that is closest to your own opinion:

SA = Strongly Agree: A = Agree: N = Neither Agree nor Disagree:  
D = Disagree: SD = Strongly Disagree

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Psychology provides valuable insights into who and what we really are.

SA A N D SD

Psychologists learn nothing about people's problems by doing experiments.

SA A N D SD

Most psychologists want to control what people do.

SA A N D SD

If people have problems, psychology can offer them help in solving them.

SA A N D SD

Psychology consists largely of vague, overgeneralized theories.

SA A N D SD

Much can be learned about our minds if more psychological research is able to be conducted.

SA A N D SD

By and large, psychological research is trivial.

SA A N D SD

Most psychology experiments are just used to develop theories that don't have anything to do with the way people really act.

SA A N D SD

I believe psychology will provide much insight into our mental processes.

SA A N D SD

Psychology wastes its time by trying to predict behavior.

SA A N D SD

Psychology helps us understand why we react to each other the way we do.

SA A N D SD

Psychology is just as much a science as are biology and physics.

SA A N D SD

The main goal of psychology is to help people understand themselves.

SA A N D SD

Psychological theory is useful in developing self-awareness.

SA A N D SD

More harm than good has resulted from psychological research.

SA A N D SD

An experiment is a waste of time because a subject learns nothing from it.

SA A N D SD

Psychology experiments are gross infringements upon individual rights.

SA A N D SD

Psychology provides a valuable learning experience.

SA A N D SD

Psychology helps one understand what causes people to behave as they do.

SA A N D SD

INSTRUCTIONS: Below you will find a list of statements about psychology. Under each statement, circle the response that is closest to your own opinion:

SA = Strongly Agree: A = Agree: N = Neither Agree nor Disagree:  
D = Disagree: SD = Strongly Disagree

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I would not take any more psychology courses.

SA A N D SD

I would not participate in a psychology experiment unless I were paid.

SA A N D SD

I would volunteer to serve as an experimenter for a psychology experiment if I had the opportunity.

SA A N D SD

I would recommend psychology courses to my friends who want to learn some interesting things.

SA A N D SD

I would try to take as many psychology courses as possible.

SA A N D SD

I would take any psychology course regardless of its difficulty.

SA A N D SD

Even if I had all of my experiment credits, I would still volunteer to participate in more psychology experiments.

SA A N D SD

I would like to conduct a psychology experiment.

SA A N D SD

I would browse in the "psychology" section at the bookstore.

SA A N D SD

I would relate my experiences in psychology experiments to my friends.

SA A N D SD

I would like to apply ideas that I've learned in psychology to situations in my life.

SA A N D SD

I would go to see campus films dealing with psychology.

SA A N D SD

I would join a psychology club.

SA A N D SD

I would not take a psychology course if I were able to avoid it.

SA A N D SD

I would never participate in any more psychology experiments.

SA A N D SD

I would take another psychology course only if I could not fit any other course in my schedule.

SA A N D SD

I would participate in a long-term psychology experiment.

SA A N D SD

I would not volunteer for a psychology experiment even if I were paid.

SA A N D SD

I would reveal personal information to an experimenter because I know it would remain confidential.

SA A N D SD

INSTRUCTIONS: Below you will find a list of statements about psychology. Please indicate whether you agree or disagree with each statement by circling the appropriate response under each statement.

I enjoy taking classes in psychology.	AGREE	DISAGREE
I become angry at the way the experimenters in psychology experiments usually treat me.	AGREE	DISAGREE
I get nervous when I'm a subject in an experiment.	AGREE	DISAGREE
I feel much more knowledgeable about people by having studied psychology.	AGREE	DISAGREE
I enjoy taking psychological tests--like "what the colors you like tell you about your personality.	AGREE	DISAGREE
I am annoyed by the psychological questionnaires which only permit rigid responses to various questions and never allow me to express my own feelings.	AGREE	DISAGREE
I hate the way that psychologists always try to trick people.	AGREE	DISAGREE
I am frightened by some of the things that psychologists know and do.	AGREE	DISAGREE
I'm glad that psychologists are active in research.	AGREE	DISAGREE
I'm glad to learn that more psychologists are studying problems related to the needs of society.	AGREE	DISAGREE
I get confused when I participate in psychology experiments.	AGREE	DISAGREE
I'm glad that the study of psychology is finally getting the recognition it deserves.	AGREE	DISAGREE
I'm glad to hear that psychologists are beginning to unravel the mysteries of human behavior.	AGREE	DISAGREE
I feel more like a guinea pig than a person when I participate in psychology experiments.	AGREE	DISAGREE
I dislike being manipulated by psychological researchers.	AGREE	DISAGREE
I can't stand the way those smug psychologists think they know everything.	AGREE	DISAGREE
I really enjoy reading about the ingenious things psychologists do to get at real behavior.	AGREE	DISAGREE
I hate psychology.	AGREE	DISAGREE
It angers me to have to spend time being in psychology experiments.	AGREE	DISAGREE

**INSTRUCTIONS:** Below you will find a list of statements about psychology. Please indicate whether you agree or disagree with each statement by circling the appropriate response under each statement.

A sound knowledge of psychological principles is valuable for modern living.	AGREE	DISAGREE
Psychology experiments are a waste of everyone's time.	AGREE	DISAGREE
Psychology should focus on how people are similar rather than on how they are different.	AGREE	DISAGREE
People who have studied psychology are better able to understand themselves than those who have never had psychology.	AGREE	DISAGREE
psychologists just try to mess up people's minds.	AGREE	DISAGREE
Most psychology experiments are done by graduate students who don't really know what they are doing.	AGREE	DISAGREE
Studying psychology is a waste of time and money.	AGREE	DISAGREE
Psychology is important because it enables us to predict what others can do.	AGREE	DISAGREE
Psychology textbooks consist of nothing but accounts of tricky experiments and weird theories.	AGREE	DISAGREE
People become more confused from the findings of psychological research.	AGREE	DISAGREE
Psychologists make too many gross generalizations from the laboratory to the real world.	AGREE	DISAGREE
Psychologists only care about proving their own theories rather than being concerned with their subject's peace of mind.	AGREE	DISAGREE
Experimenters intentionally trick subjects to make fools of them.	AGREE	DISAGREE
Psychology is an important branch of science.	AGREE	DISAGREE
Money invested in psychological research is well spent.	AGREE	DISAGREE
Psychology experiments are gross abuses of the concept of scientific investigation.	AGREE	DISAGREE
I don't believe that psychology has any purpose	AGREE	DISAGREE
Psychology is just another form of magic.	AGREE	DISAGREE
Psychological research offers intelligent explanations of human behavior.	AGREE	DISAGREE



INSTRUCTIONS: Below you will find a list of statements about psychology. Please indicate whether you agree or disagree with each statement by circling the appropriate response under each statement.

I would sign up for an experiment and then deliberately not show up.

AGREE DISAGREE

I would try to give false information in psychology experiments.

AGREE DISAGREE

I would never do some of the things that psychologists ask their subjects to do.

AGREE DISAGREE

I would have to be paid to participate in any more psychology experiments.

AGREE DISAGREE

I would like to participate in as many psychology experiments as I have time for.

AGREE DISAGREE

I would hesitate to participate in a psychology experiment because it might be dangerous.

AGREE DISAGREE

I would assist in a research project as an experimenter.

AGREE DISAGREE

I would advise a friend to not participate in psychology experiments.

AGREE DISAGREE

This is the last psychology course that I would want to take.

AGREE DISAGREE

I would recommend psychology to a friend as an interesting course to take.

AGREE DISAGREE

I would like to take part in more psychology experiments because I find them to be learning experiences.

AGREE DISAGREE

I plan to see the experimenter to learn more about the results of each experiment that I participate in.

AGREE DISAGREE

I expect to do more psychological research in order to better understand human motivation.

AGREE DISAGREE

I intend to learn more about clinical psychology.

AGREE DISAGREE

I wouldn't want to be a subject in any psychology experiment because the researcher's main objective seems to be to trick people.

AGREE DISAGREE

I would like to develop into a fuller person by interacting with a psychologist in counseling sessions.

AGREE DISAGREE

If I have children, I would use the things I learned in psychology class in rearing them.

AGREE DISAGREE

I would recommend participating in an experiment to a friend.

AGREE DISAGREE

I would volunteer for an experiment if it sounded interesting; not because of the number of credits I got for being a subject.

AGREE DISAGREE

PLEASE ANSWER THE FOLLOWING QUESTIONS. SOME REQUIRE YOU TO CIRCLE THE APPROPRIATE ANSWER; OTHERS REQUIRE A WRITTEN RESPONSE.

- 
1. Age: \_\_\_\_\_ Years
  2. Sex: (Circle one) Male Female
  3. Year in college (Circle one) First Second Third Fourth
  4. If you have declared a major, please list it. \_\_\_\_\_
  5. What psychology class are you presently enrolled in (Circle one)?  
160 170
  6. If you have had any other psychology courses than this one, please list them: \_\_\_\_\_
  7. Not including this one, how many other psychology experiments have you participated in (Give number)? \_\_\_\_\_
  8. What percentage of your psychology classes have you attended this term? Give a percent from 0 to 100: \_\_\_\_\_
  9. What percentage of the reading assignments for your psychology class have you done so far this term? Give answer in terms of the percentage you've read of what you were required to do so far this term: \_\_\_\_\_
  10. Have you had exams in your psychology class this term? YES NO
  - 10a. If yes, what grade, or average grade have you received? \_\_\_\_\_
  11. What grade do you expect to receive in your psych class? \_\_\_\_\_
  12. How do you feel about your psychology instructor? Circle one answer:
    - A. Very favorable
    - B. Somewhat favorable
    - C. Neutral--neither favorable nor unfavorable
    - D. Somewhat unfavorable
    - E. Very unfavorable
  13. Do you plan to take any more psychology courses? YES NO
  - 13a. If YES, what courses? (list) \_\_\_\_\_
  14. How valuable do you think this psychology class has been for you as a student? Circle one answer:
    - A. Extremely valuable
    - B. Somewhat valuable
    - C. Neither valuable or useless--Neutral
    - D. Somewhat useless
    - E. Extremely useless

## BIBLIOGRAPHY

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- Ajzen, I., & Fishbein, M. The prediction of behavioral intentions in a choice situation. Journal of Experimental Social Psychology, 1969, 5, 400-416.
- Allport, G. W. Attitudes. In C. Murchison (Ed.), A handbook of social psychology. Worcester, Mass.: Clark University Press, 1935.
- Allport, G. W. The historical background of modern social psychology. In G. Lindzey & E. Aronson (Eds.), The handbook of social psychology, Vol. 1. Reading, Mass.: Addison-Wesley Publishing Co., 1968.
- Banta, T. J. Social attitudes and response styles. Educational and Psychological Measurement, 1961, 21, 543-557.
- Barclay, J. E., & Weaver, H. B. Comparative reliabilities and the ease of construction of Thurstone and Likert attitude scales. Journal of Social Psychology, 1962, 58, 109-120.
- Campbell, D. T., and Fiske, D. W. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 1959, 56, 81-105.
- Chein, I. Behavior theory and the behavior of attitudes: Some critical comments. Psychological Review, 1948, 55, 175-188.
- Doob, L. W. The behavior of attitudes. Psychological Review, 1947, 54, 135-156.
- Dulany, D. E. Awareness, rules, and propositional control: A confrontation with S-R behavior theory. In D. Horton & T. Dixon (Eds.), Verbal behavior and S-R behavior theory. New Jersey: Prentice-Hall, 1967.
- Edwards, A. L., & Kenney, K. C. A comparison of the Thurstone and Likert techniques of attitude scale construction. Journal of Applied Psychology, 1943, 30, 72-83.
- Eysenck, H. J., & Crown, S. An experimental study in opinion-attitude methodology. International Journal of Opinion and Attitude Research, 1949, 3, 47-86.
- Ferguson, L. W. A study of the Likert technique of attitude scale construction. Journal of Social Psychology, 1941, 13, 51-57.

- Fishbein, M. Attitudes and the prediction of behavior. In M. Fishbein (Ed.), Readings in attitude theory and measurement. New York: Wiley, 1967.
- Fishbein, M., & Ajzen, I. Belief, attitude, intention, and behavior: An introduction to theory and research. Reading, Mass.: Addison-Wesley, 1975.
- Freedman, J. L., & Fraser, S. C. Compliance without pressure: The foot-in-the-door technique. Journal of Personality and Social Psychology, 1966, 4, 195-202.
- Gustav, A. Students' attitudes toward compulsory participation in experiments. The Journal of Psychology, 1962, 53, 119-125.
- Holmes, D. S. Amount of experience in experiments as a determinant of performance in later experiments. Journal of Personality and Social Psychology, 1967, 7, 403-407.
- Katz, D., & Stotland, E. A preliminary statement to a theory of attitude structure and change. In S. Koch (Ed.), Psychology: A study of a science, Vol. 3. New York: McGraw-Hill, 1959.
- Kavanagh, M., Mackinney, A., & Wolins, L. Issues in managerial performance: Multitrait-Multimethod analyses of ratings. Psychological Bulletin, 1971, 75, 34-49.
- Kothandapani, V. Validation of feeling, belief, and intention to act as three components of attitude and their contribution to the prediction of contraceptive behavior. Journal of Personality and Social Psychology, 1971, 19, 321-333.
- Likert, R. A technique for the measurement of attitudes. Archives of Psychology, 1932, No. 140.
- Magnusson, D. Test theory. Reading, Mass.: Addison-Wesley Publishing Co., 1967.
- Osgood, C. E., & Tannenbaum, P. H. The principle of congruity in the prediction of attitude change. Psychological Review, 1955, 62, 42-55.
- Ostrom, T. M. Relationship between affect, behavior, and cognition. Journal of Experimental Social Psychology, 1969, 5, 12-30.
- Poppleton, P. K., & Pilkington, G. A comparison of four methods of scoring an attitude scale in relation to its reliability and validity. British Journal of Social and Clinical Psychology, 1964, 3, 36-39.

- Rosenberg, M. J. Cognitive reorganization in response to the hypnotic reversal of attitudinal affect. Journal of Personality, 1960, 28, 39-63.
- Rosenberg, M. J., & Hovland, C. I. Cognitive, affective, and behavioral components of attitudes. In C. I. Hovland & M. J. Rosenbert (Eds.), Attitude organization and change. New Haven: Yale University Press, 1960.
- Seiler, L. H., & Hough, R. L. Empirical comparisons of the Thurstone and Likert techniques. In G. F. Summers (Ed.), Attitude measurement. Chicago: Rand McNally and Co., Inc., 1970.
- Steininger, M. P. On measuring a complex attitude: The construct validity of an attitude-toward-psychology scale. Psychological Reports, 1970, 26, 501-502.
- Thurstone, L. L., & Chave, E. J. The measurement of attitude. Chicago: University of Chicago Press, 1929.
- Titchener, E. B. Experimental psychology of the thought process. New York: Macmillan, 1909.
- Wicker, A. Attitudes versus actions: The relationship of verbal and overt behavioral responses to attitude objects. The Journal of Social Issues, 1969, 25, 41-78.
- Woodmansee, J., & Cook, S. Dimensions of verbal racial attitudes: Their identification and measurement. Journal of Personality and Social Psychology, 1967, 7, 240-250.

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