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ABSTRACT

Attitude measurement through Likert-type surveys usually provides no opportunity to assess the importance of the statements of the subjects. This study, involving 479 graduate and undergraduate students, examines the question of whether importance and agreement measures have different underlying dimensions, and examines the question of whether the addition of an importance measure to an agreement measure will change these dimensions. The instrument used for this study was a university environment attitude survey, including 25 statements describing characteristics of atmosphere. Subjects were grouped into three randomly equivalent groups of 160 each. A factor analytic procedure was conducted for each of the three groups. Findings indicate that importance and agreement measures have similar underlying dimensions, and that the addition of an unimportance measure to an agreement measure will not change these dimensions. (Author/LMO)

The Dimensionality of Agreement and Importance for Attitude Scales

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Abstract

Attitude measurement through Likert-type surveys usually provides no opportunity to assess the importance of the statements of the subjects. This study, involving 479 graduate and undergraduate students, examines the question of whether importance and agreement measures have different underlying dimensions, and examines the question of whether the addition of an importance measure to an agreement measure will change these dimensions. The data indicate that importance and agreement measures have similar underlying dimensions and that the addition of an importance measure to an agreement measure will not change these dimensions.

The Dimensionality of Agreement and Importance for Attitude Scales

Attitude measurement has been the topic of many articles and books during the past half century. In addition to measuring attitude, researchers have also been concerned with how attitudes affect behavior. Guttman (1947) stated that researchers needed to discern more than just a person's attitudes concerning an upcoming election. He proposed that researchers needed to know how important a certain attitude was to a person. A person might express a certain attitude concerning an election, but is the attitude important enough to get them to vote?

Guttman maintained that one way to solve this problem was to mesure the intensity of a person's attitude. This could be done by asking two questions. The first question was a Likert-type attitude item designed to measure content while the second question was designed to measure the intensity of feeling concerning that attitude. Guttman then correlated the content scale scores with the intensity scores to calculate a U or a J shaped curve. Guttman theorized

that the zero point of this curve was the point that separated those who agreed or disagreed with the content item. This technique was found to be useful in some instances.

Later researchers have postulated that an attitude has two dimensions: direction and importance (Schufletowski & Reed, 1970; Osgood, Suci, & Tannenbaum, 1957). Direction is generally defined as the postiveness or negativeness of the response to a given stimulus or associated symbol. For example, if a subject is asked to respond to a statement with "agree" or "disagree," the subject's choice would indicte the direction of his or her attitude, but not its importance or depth. It has been noted on some attitude scales that respondents attempt to qualify directional responses by writing in the margin indicating which items are felt to be very important or unimportant. Thus, directionality may not provide all of the relevant information concerning a subject's attitude.

Schufletowski and Reed in their study (1970) maintain that a Likert-type attitude item does not sufficiently measure importance. They proposed to

measure importance by asking subjects in their study to respond in two ways. The first involved a typical Likert-type response set requesting the subject to select for each statement one of five responses: (1) strongly agree, (2) agree, (3) no opinion, (4) disagree, or (5) strongly disagree. The second was a rating of personal importance: (1) very important, (2) quite important, (3) of little importance, and (4) doesn't matter to me. This second response set was designed to measure the strength or importance of an attitude. The authors then compared the results of Guttman scaling, Likert scaling, and importance responses as methods of identifying internal consistency. Their results were supportive of the theory that the measurement of the importance of an attitude was an important element in assessing that attitude.

In a more recent study, Mallory (1982) tested whether the predictive power of a Likert-type item could be improved by the addition of an importance measure. Participants in his study answered 14 items on both an agreement and importance measure. Mallory concluded that the addition of an importance dimension

produces a relatively small increase in predictive power.

Current literature in the field of attitude measurement and attitude theory provides few additional empirical studies directly related to the strength or importance of attitudes. The purpose of this study was to investigate further the existence of dimensions of direction and importance, addressing the following questions:

1. Do importance and agreement measures have different underlying dimensions?
2. Will the addition of an importance measure to an agreement measure change these underlying dimensions?

Methodology

Instruments

The instrument used for this study was a university environment attitude survey. Twenty-five statements describing characteristics of atmosphere were included. Three forms of the instrument were constructed. The first form asked students to indicate the degree to which they agreed that the statements described their university and also asked the students

to indicate how important the given characteristics were to them personally. Four choices were presented for the agreement dimension, ranging from strongly agree to strongly disagree (the "no opinion" option was not included). Four choices were given for the importance dimension, ranging from not important to very important. The second form included the same 25 statements but only the agreement dimension was measured. The third form presented the same 25 items but only the importance dimension was measured.

Subjects

The subjects for this study were 479 students at the University of Virginia. The respondents included undergraduate students with majors in art, commerce, education, biology, social science, English and freshman with undeclared majors. All graduate students were in the field of education.

Procedure

Researchers administered the university environment survey at the beginning of undergraduate accounting, education and sociology classes as well as graduate special education, science education and educational research classes. The three forms were

distributed at random in each situation and each student responded to only one form of the instrument.

Analysis

There were three randomly equivalent groups, each with approximately 160 subjects. A factor analytic procedure was conducted for each of the three groups. The responses of the students in the first group, each of whom responded to both the agreement and importance on each of the 25 items, formed the data for the first analysis. The data for the second analysis was collected from the agreement resonses to the 25 items by the second group of students. Students in the third group responded only to importance; these data were then used for the third analysis. Each set of data was subjected to a principal component analysis and the resulting dimensions were rotated to a simple structure according to the Varimax criterion. The factor loadings for each factor analysis were then examined. The factors were then compared using the correlation coefficient formula (Gorsuch, 1974).

Reliability coefficients were calculated for the responses for each group. The resulting Cronbach's alpha for each set of responses was then compared.

Means and standard deviations were also calculated for the responses of each group. These values enabled researchers to check agreement and importance responses for specific items.

Results and Discussion

The first factor analysis procedure was conducted wtih the agreement responses of the first group. The four-factor solution accounted for 44.6% of the total variation. The eigenvalues of the first four factors from the principal component analysis were 5.1, 2.4, 2.0 and 1.7 respectively. The factor loadings of .30 or above for each item are presented in Table 1. Factor 1 measured an academic environment component while factor 2 measured a social atmosphere component. Factor 3 measured a faculty performance component while factor 4 gauged an unknown component.

The second factor analysis was conducted with the importance responses of the first group. The four-factor solution accounted for 42.9% of the total variation. The eigenvalues of the first four factors from the principal component analysis were 4.8, 2.6, 1.9 and 1.4 respectively. The factor loadings of .30 or above for each item are located in Table 2. Factor

1 measured social atmosphere while factor 2 gauged a freedom of expression component of an academic environment construct. Factor 3 measured another academic environment component while factor 4 measured a faculty interest component.

Comparison of the factor loadings for the agreement and importance responses for group 1 indicates that factor 1 of the agreement responses is similar to Factor 2 of the importance responses. Both factors measured an academic atmosphere dimension and the correlation coefficient for the two factors was .762. A social atmosphere dimension was measured by factor 2 of the agreement responses and factor 1 of the importance responses; the resulting correlation coefficient was .675. Factor 3 of both the agreement and importance responses measured an academic concerns dimension; .57 was the correlation coefficient for this pair. Factor 4 for both the agreement and importance responses had a correlation coefficient of .239 indicating a dissimilarity between these factors.

The third factor analysis was conducted with the agreement responses of the second group. The four-factor solution accounted for 39.1% of the total

variation. The eigenvalues of the first four factors from the principal component analysis were 4.8, 1.8, 1.7 and 1.5 respectively. The factor loadings of .30 or above for each item are presented in Table 3. Factor 1 measured an academic environment component while factor 2 gauged a social activities component. Factor 3 measured a new ideas component while factor 4 gauged a niceness component.

The fourth factor analysis was conducted with the importance responses of the third group. The four-factor solution accounted for 44.8% of the total variation. The eigenvalues of the first four factors from the principal component analysis were 5.3, 2.5. 1.8 and 1.6 respectively. The factor loadings of .30 or above for each item are presented in Table 4. Factor 1 measured an academic enviornment component while factor 2 gauged freedom of expression. Factor 3 measured a social activities component and factor 4 gauged a fine arts component.

Comparison of the factor loadings for the second and third groups indicates that factor 1 of both groups measures an academic environment dimension; .910 was the correlation coefficient for the factors. Factor 2

of the agreement responses and factor 3 of the importance responses measured a social activities dimension; .672 was the correlation coefficient for the pair. Factor 3 of the agreement resonses and factor 2 of the importance responses measured a freedom in the academic environment dimension and the correlation coefficient for this pair was .566. Factor 4 for both groups was dissimilar with a correlation coefficient of .243.

To answer our first question, importance and agreement measures do not have different underlying dimensions, Part I and II of Table 5 show the correlation coefficients for the comparison of agreement and importance resonses of group 1 and the comparison of the agreement resonses of group 2 with the importance responses of group 3. The same factors or underlying dimensions emerge when students respond to an agreement and importance measure on the same form as well as when some students respond to an importance measure and other students respond to an agreement measure.

To answer our second question, the agreement responses of group 1 were compared with the agreement

responses of group 2. These comparisons can be found in Part III of Table 5. The correlation coefficients indicated that the factors are more similar than dissimilar and that the addition of an importance measure will not alter the underlying dimensions.

In addition to the factor analyses, a reliability coefficient, Cronbach's alpha, was calculated for the responses in each group. The reliability of agreement resonses in group 1 was .822 while the reliability of importance resonses was .854. The reliability of agreement responses in group 2 was .810 and the reliability of importance responses in group 3 was .798.

Finally, means and standard deviations were calculated for the agreement and importance responses for the first group. These values enabled the researchers to compare means and standard deviations for each item.

An analysis of the means and standard deviations for the first groups' agreement and importance responses indicates differences in some of the items. This would indicate that they are measuring the content of the item differently. Thus, adding an importance

measure may increase the researcher's ability to measure a person's attitude.

The above findings indicate that for most attitude surveys the importance measure should not be added since it increases the respondent's time to take the survey and increases the researcher's time involved in the analysis. However, if small gains in predictive power and reliability are very important then the addition of an importance measure is justified.

References

Gorsuch, R. L. (1974). Factor analysis. Philadelphia: W. B. Saunders Company.

Guttman, L., & Suchman, E. A. (1947). Intensity and a zero point for attitude analysis. American Sociological Review, 12, 57-68.

Mallory, W. D. (1982). An empirical study: The effects of the addition of a measure of importance on the predictive power of Likert-type items. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Osgood, C. E., Suci, G. J., & Tannenbaum, P.H. (1957). Measurement of meaning. Chicago: University of Illinois Press.

Schufletowski, F. W., & Reed, R. L. (1970). Value structure: Another dimension to attitude measurement? Journal of Social Psychology, 82, 127-129.

Table 1

Varimax Rotated Factor Loadings
Group 1 Agreement Responses

Item	Factor 1	Factor 2	Factor 3	Factor 4
1			.56	
2	.42			
3		.34		
4			.49	
5				.70
6				.44
7				.34
8		.32		
9	.30			
10			-.58	
11	.33		.46	
12	.36			
13		.55		
14	.70			
15		.37		
16	.81			
17	.56			
18		.72		
19	.36	.41		
20	.40			
21	.49	.33		
22		.39		
23	.41	.52		
24				
25	.40	.53		

Note: Factor loadings with absolute values less than .30 are omitted.

Table 2

Varimax Rotated Factor Loadings
Group 1 Importance Responses

Item	Factor 1	Factor 2	Factor 3	Factor 4
1				
2				.65
3				
4			.57	
5	.42			
6				
7			.46	
8				
9		.30		
10	.31			
11			.41	
12			.85	
13	.60			
14		.83		
15	.54			
16	.31		.36	.36
17		.42		.42
18	.32			.32
19				.50
20	.65			
21		.45	.32	
22	.52			
23		.62		
24	.47			.43
25		.45	.31	.35

Note: Factor loadings with absolute values less than .30 are omitted.

Table 3

Varimax Rotated Factor Loadings
Group 2 Agreement Responses

Item	Factor 1	Factor 2	Factor 3	Factor 4
1	.43			
2	.35			.37
3				
4	.44	.43		
5	.56			.33
6	.38			
7	.38			
8				
9	.40			
10				.58
11	.51	.42		
12	.44	.34		
13			.32	
14	.49			
15		.51		.37
16		.57		
17		.39		
18				
19	.47			
20		.48		
21	.41			
22			.49	
23	.42		.58	
24		.45		
25	.53			

Note: Factor loadings with absolute values less than .30 are omitted.

Table 4

Varimax Rotated Factor Loadings
Group 3 Importance Responses

Item	Factor 1	Factor 2	Factor 3	Factor 4
1				
2	.55			
3	.30			
4	.51			-.42
5			.43	
6	.45	.34		
7	.43			
8				.47
9	.62			
10				.30
11		.49		-.33
12	.55			
13			.33	
14		.79		
15			.68	
16	.36		.44	
17	.53			
18				
19	.50			
20			.38	
21	.49			
22				.50
23		.75		
24			.53	.33
25	.62			

Note: Factor loadings with absolute values less than .30 are omitted.

Table 5

Correlation Coefficients

I.	Group 1 Agreement Responses	Group 1 Importance Responses	Correlation Coefficient
	Factor 1	Factor 2	.762
	Factor 2	Factor 1	.675
	Factor 3	Factor 3	.570
	Factor 4	Factor 4	.239
II.	Group 2 Agreement Responses	Group 3 Importance Responses	Correlation Coefficient
	Factor 1	Factor 1	.910
	Factor 2	Factor 3	.672
	Factor 3	Factor 2	.566
	Factor 4	Factor 4	.243
III.	Group 1 Agreement Responses	Group 2 Agreement Responses	Correlation Coefficient
	Factor 1	Factor 1	.751
	Factor 2	Factor 3	.894
	Factor 3	Factor 2	.550
	Factor 4	Factor 4	.434

Table 6

Means and Standard Deviations
for Group 1

Item	Agreement Responses X	Agreement Responses SD	Importance Responses X	Importance Responses SD
1	2.7	.65	3.1	.74
2	3.2	.49	3.7	.48
3	1.7	.63	1.6	.69
4	3.5	.61	3.5	.60
5	2.9	.63	1.8	.78
6	2.6	.69	3.2	.86
7	3.0	.65	3.3	.74
8	2.1	.76	2.0	.81
9	2.6	.71	3.5	.60
10	2.2	.68	1.4	.68
11	3.2	.62	3.4	.63
12	3.1	.67	3.6	.59
13	2.4	.77	1.5	.72
14	2.9	.69	3.3	.70
15	3.2	.64	2.6	.88
16	3.4	.65	3.5	.63
17	3.0	.69	3.6	.58
18	2.7	.63	2.6	.91
19	2.4	.72	3.5	.63
20	3.2	.69	2.1	1.02
21	3.0	.54	3.3	.66
22	2.3	.68	1.9	.80
23	2.6	.65	3.2	.67
24	3.5	.54	2.9	.98
25	2.9	.74	3.6	.53