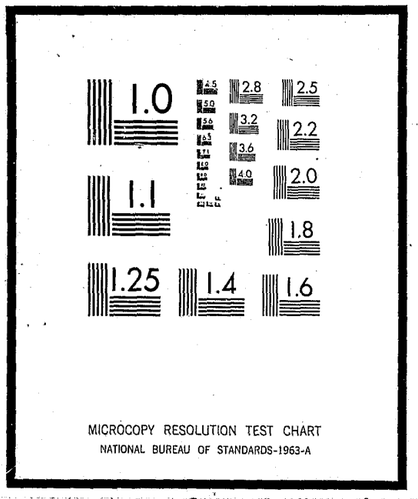

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THE CONSTRUCTION OF LIKERT-TYPE ATTITUDE SCALES

An Examination of Alternative Techniques of Item Selection*

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The Metropolitan Criminal Justice Center operates the Pilot City Program in Chesapeake, Norfolk, Portsmouth, and Virginia Beach, Virginia. Established in September, 1971, the Center is a research and program planning and development component of the College of William and Mary in Williamsburg, Virginia. The Center's Pilot City Program is one of eight throughout the nation funded by the Law Enforcement Assistance Administration of the U. S. Department of Justice. The basic purpose of each Pilot City project is to assist local jurisdictions in the design and establishment of various programs, often highly innovative and experimental in nature, which will contribute over a period of years to the development of a model criminal justice system. Each Pilot City team is also responsible for assuring comprehensive evaluation of such programs, for assisting the development of improved criminal justice planning ability within the host jurisdictions, and for providing technical assistance to various local agencies when requested.

This monograph resulted from discussions between Dr. Thomas, Dr. Nelson, and Dr. Williams concerning methodological issues in the preparation and analysis of the MCJC's Criminal Justice Attitude and Victimization Survey. That instrument was administered in the winter of 1973-1974; the results of the survey will be published in the fall of 1974. The Center believes that this methodological note on the refinement of a basic statistical technique will be of general interest and assistance to researchers in the criminal justice field.

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THE CONSTRUCTION OF LIKERT-TYPE ATTITUDE SCALES

An Examination of Alternative Techniques of Item Selection

Despite the availability of several general models for the construction of attitude scales, the procedure initially described by Likert (1932) continues to be employed far more frequently than any alternative. This preference is related to the simplicity of the method involved as well as to the ease of administering and scoring Likert-type scales. More importantly, the studies which have attempted to compare the Likert procedure with such alternatives as Guttman scales, Thurstone scales, the semantic differential, and self-rating measures have consistently shown that attitude measures developed by the Likert procedure are more reliable and function more effectively as predictors of behavior (cf. Edwards and Kinney, 1946; Green, 1954; Edwards, 1957; Weaver, 1962; Poppleton and Pilkington, 1964; Tittle and Hill, 1967; Kerlinger, 1973: 495-499). One might expect the success of Likert-type scales in such comparative analyses would have resulted in a considerable volume of work in which a thorough examination of the various problems associated with such scales is addressed. Unfortunately, this is not the case.

This paper will explore one largely ignored issue that plays a potentially significant role in the construction of Likert scales: the choice of criteria by means of which to define discriminatory items in the construction of a final summated scale score. More specifically, we will examine variations on three general perspectives on item selection that have been advanced. Before doing so, a brief review of the logic which underlies each of these approaches may prove useful.

First, and perhaps the most frequent technique that is employed, one may ask whether each of the items in a Likert-type scale is able to discriminate between groups which vary with respect to the degree of affect they express toward the attitude object being examined. The rationale for this view is quite simple. If an item is responded to in much the same way by individuals who otherwise show discrepant levels of affect, the item must be defined as non-discriminatory and excluded from the final scale. Such reasoning clearly provides the foundation for the frequently encountered form of item analysis in which an initial scale score is computed by summing the item weights, defining high and low groups (for example, the first and fourth quartiles), and comparing the mean responses of these polar groups on each of the attitude items by means of a t-test or some analogous statistic. Should the differences that are detected be statistically insignificant, the appropriate item or items are deleted from

the scale, and the final scale score is determined by summing the response weights of only the items which did yield significant differences.

Focusing on the significance of differences in item responses is certainly not the only way to item analyze Likert statements, perhaps not even an adequate way in light of the fact that it relies exclusively on the responses of fairly extreme groups rather than on the entire sample. Indeed, the tendency for Likert-type scales to yield extremely positive or negative items relative to other general scaling models has been noted elsewhere (cf. Ferguson, 1941). A second general approach to item analysis which is at least in part responsive to this issue suggests that knowledge of an individual's response to one scale item is only useful to the extent that this knowledge facilitates prediction of the degree of affect toward an attitude object. This, in turn, supports the use of various item-to-total-scale-score correlations in which the responses on each of the items in a scale are correlated with an initial summated scale score. Items which do not yield significant correlations are not included in the computation of the final scale score.

Two problems confront this technique. First, since the initial scale score is in part determined by each item weight, some level of correlation is built into the computation. This would not appear to be a serious problem as long as an adequate number of items are included in the initial scale; even if the number of items is small, the problem can be correlated by

correlating the item responses with an initial summated scale score which includes the weight of the item being examined. Second, and a problem not escaped through employing such measures as the t-test, the large sample sizes frequently employed in survey research increase the likelihood of obtaining significant correlations. For example, a moderately large sample would show that correlations between item responses and total scales scores are significant when the magnitude of the correlation is less than .10 (cf. Schuessler, 1971: 445). This problem can, of course, be overcome by stipulating a level of correlation rather than a level of statistical significance.

Finally, an uncommon but potentially useful approach to item selection involves a process which can provide for both item selection and item weighting. While this approach is more sophisticated statistically and more difficult to follow computationally, the underlying logic seems sound, and it is certainly responsive to a major criticism of the Likert procedure. Likert-type attitude statements are traditionally treated as if they expressed similar levels of affect toward an attitude object, but it seems clear that a "strongly agree" response to one item may often not express the same level of affect that a comparable response to another item expresses (cf. Ferguson, 1941; Upshaw, 1968). Thus, a uniform weighting of items may actually distort the ultimate placement of each respondent along the latent attitude contimuum which the measure is designed to reflect. Some would argue that this may be countered by using multiple standards for item selection that provide for

weighting either before or after the determination of whether the item has the requisite predictive or discriminatory power. The wide-spread availability of the Statistical Package for the Social Sciences, for example, encourages the use of a weighting procedure by providing a description of a means of assigning weights for standardized item responses through the use of factor score coefficients derived from factor analysis (Nie, Bent, and Hull, 1970: 226-227). On the other hand, there is reason to believe that these factor score coefficients may be used without any previous determination of the predictive or discriminatory power of the item (Nie, Bent, and Hull, 1970: 226). If no selection criteria are employed, of course, this approach is really more a technique of item weighting than one of item analysis in the traditional sense.

The immediate issue is not the appropriateness or inappropriateness of any of the several statistical techniques that are called for in selecting or weighting items in accordance with any one of the three general modes of item analysis outlined above. Used knowledgeably, we see no reason why a sound argument could not be made in support of each. On the other hand, published analyses often leave the impression that many researchers assume that one approach is roughly the same as another and that the really important aspect of the research lies in the relative sophistication of the analysis performed after the attitudinal measure has been created. This is not unlike the fairly pervasive belief that the choice between the Likert procedure and, for example, the semantic differential

or Guttman technique is purely one of personal preference, a tendency that led Upshaw (1968: 107) to comment that some researchers improperly "appear to view scaling models as a set of alternatives to be chosen as whimsically as one selects a salad at a cafeteria." On the other hand, perhaps the products of the several types of item analysis are really not that dissimilar. There is certainly some reason to believe that the scales yielded by several of the more popular general scaling models yield results which intercorrelate fairly well. Still, the point remains that there is simply insufficient reason to believe that this is the case with regard to the alternative techniques of item analyais that have been employed in the creation of Likert-type scales without more evidence than is presently available.

A Comparison of Item Selection Techniques

Two specific questions result from the considerations outlined above. First, in choosing one alternative method of selecting attitude items for a Likert-type measure over another, should one expect to find a comparable set of items being defined as appropriate for inclusion in the final summated scale? If so, then perhaps there is no issue to examine and any one of the several techniques would be equally useful. If dissimilar final scales are produced, however, a second question would have to be raised: Which item selection technique provides the best final scale?

The initial question can be addressed directly. A common pool of items may be examined using each of several alternatives that are available. Either a similar set of items is shown to be appropriate for inclusion in the final scale or dissimilar sets are selected. The second question cannot be addressed so easily, but a tentative answer can be arrived at by an examination of the predictive utility of each of the dissimilar scales. This is the approach that will be employed in the analysis which follows. Two sets of attitude items that were designed as predictors of drug use among university students were analyzed and then employed as predictors of whether the respondents report ever having used drugs for non-medical purposes and, if so, the frequency of their drug use. One of the attitude measures was developed to measure students' attitudes toward drug use; the other to measure attitudes toward the legal system. Prior research in this area has shown that both attitudinal variables should be useful as predictors of both drug use and frequency of drug use.

Several alternative item analysis techniques were applied to each of the two sets of attitude items. First, the traditional t-test was calculated by computing an initial summated scale score based on the responses to each set of Likert-type items and comparing the response patterns of those members of the sample of 352 students whose initial scores were in the most negative 25 percent of the sample with those who were in

the most positive 25 percent of the sample. Each item in the initial scale was defined as adequately discriminatory only if the t-test indicated a difference between the positive and negative groups that were significant at or lower than the .001 significance level.

Second, again working from an initial summated acale score, item responses were correlated with the total scale score to determine the extent to which knowledge of each item response could serve as a predictor of the total scale score. The logic involved here is quite different from that involved in the use of t-tests. Initially, the item-to-scale-score technique uses data obtained from the entire sample of respondents, not only the data obtained from polar groups. The criterion for inclusion is not the presence of a statistically significant difference between the mean responses of two groups, but the quality of the predictions that each item provides. As noted previously, this is important because differences between polar groups that are normally so slight as to be substantively insignificant may be statistically significant when the sample size is large. In this calculation an item was retained for inclusion in the final summated scale score only if the item-to-scale-score correlation was equal to or greater than a Pearsonian correlation of .50.

Third, but a technique rather closely related to that described above, each of the two scales were factor analyzed twice, once using principal axis factor analysis with orthogonal solution, once using a oblique solution. Both types of

rotation were used because, although one would prefer to construct a scale in which the item-to-item correlations were minimal and the item-to-scale correlations were high, this is not always possible. The assumption is that the oblique solution will adjust for intercorrelations among the attitude items and that an orthogonal solution could yield inappropriate results were such intercorrelations present. As can be seen from an examination of Tables 1 and 2 in which the intercorrelations between the initial items in each of the scales are presented, the levels of association between the items, although generally low, are sufficiently substantial in several instances that the adjustment that is provided by an oblique factor analysis would appear to be called for. Regardless, in both sets of factor analysis a common criterion was employed by defining an item as sound only if the factor loading between the item and the factor was .50 or greater.

TABLE 1

Intercorrelations Between Attitude Toward Drug Items

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11
Item 1	1.000	0.090	0.063	0.022	0.085	0.092	0.000	0.097	0.252	0.020	0.073
Item 2		1.000	0.447	0.417	0.110	0.170	0.121	0.183	0.376	0.219	0.117
Item 3			1.000	0.437	0.120	0.166	0.147	0.168	0.344	0.208	0.175
Item 4				1.000	0.073	0.162	0.199	0.219	0.303	0.209	0.148
Item 5					1.000	0.299	0.246	0.319	0.233	0.073	0.235
Item 6						1.000	0.228	0.512	0.276	0.217	0.414
Item 7							1.000	0.254	0.181	0.194	0.257
Item 8								1.000	0.302	0.208	0.358
Item 9									1.000	0.072	0.374
Item 10										1.000	0.150
Item 11											1.000

TABLE 2

Intercorrelations Between Attitude Toward the Law Items

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11
Item 1	1.000	0.218	0.307	0.182	0.167	0.305	0.368	0.171	0.333	0.448	0.177
Item 2		1.000	0.261	0.302	0.217	0.343	0.429	0.142	0.344	0.311	0.221
Item 3			1.000	0.261	0.228	0.359	0.535	0.078	0.427	0.291	0.288
Item 4				1.000	0.088	0.308	0.323	0.051	0.302	0.243	0.145
Item 5					1.000	0.141	0.234	0.164	0.251	0.258	0.214
Item 6						1.000	0.475	0.112	0.343	0.316	0.219
Item 7							1.000	0.102	0.499	0.376	0.237
Item 8								1.000	0.114	0.160	0.133
Item 9									1.000	0.286	0.217
Item 10										1.000	0.359
Item 11											1.000

Finally, each of the two sets of attitude items were assigned weights through the calculation of factor score coefficients. As with the initial factor analysis, the assignment of weights was done twice, once using the factor score coefficients assigned when an orthogonal solution was employed; once when an oblique solution was used. No attempt was made to reduce the number of items at this point because our intent was only to compare the predictive utility of weighted item responses with that provided by unweighted responses. Further, our purpose was adequately served by computing factor score coefficients derived from the most important factor that was derived from the factor analysis.

In short, we subjected each set of attitude items to a series of analyses, each of which yielded a scale that we could reasonably report to be a measure of attitudes toward drugs or attitudes toward the law. We created two scales by determining the discriminatory power of each item through examining the degree of difference between the response patterns of those who were located in the first and fourth quartiles of each of the scales as measured by an initial summated scale score. We developed two more measures by calculating item-to-scale-score correlations between each item and the scale that it was intended to be a part of and by eliminating any item which did not yield a correlation of .50 or greater. We then analyzed each set of items and created additional scales that were defined by the summation of the unweighted item responses of those items whose factor

loadings were .50 or higher. Because two types of factor analysis were utilized, this produced four scales. Finally, four more scales were created by calculating weighted scale scores on each of the two sets of items on the basis of two types of factor analysis. Thus, from our two initial pools of Likert-type items, we were able to compute twelve separate measures: six scales to measure attitudes toward drugs; six to measure attitudes toward the law.

The first question that this analysis was designed to answer relates to whether these several techniques yield comparable final scales. The answer is an unequivocal "No." Table 3 provides a summary of the relevant statistical information derived from our analysis of the eleven initial items in the drug attitudes scale, and similar findings on the law scale are reported in Table 4.

TABLE 3

Attitudes Toward Drug Use

	Scale 1	Scale 2	Scale 3	Scale 4	Scale 5	Scale 6
Item 1	14.06	.579	.323*	.199*	.012	.464
Item 2	13.10	.604	.460*	.448*	.104	.530
Item 3	14.56	.645	.582	.620	.176	.630
Item 4	8.73	.488	.426*	.464*	.125	.452
Item 5	8.82	.466*	.207*	.107*	-.006	.312
Item 6	12.68	.619	.539	.561	.160	.593
Item 7	20.72	.727	.761	.843	.460	.798
Item 8	5.87	.369*	.068*	-.043*	-.031	.163
Item 9	14.25	.659	.596	.638	.208	.643
Item 10	11.89	.634	.244*	-.033*	-.148	.491
Item 11	9.16	.508	.215*	.077*	-.009	.349

*Indicates that the item was not included in the computation of the final scale score.
Scale 1 = Scale developed using t-tests to determine item selection. Figures reported in the column are critical ratios obtained with 190 degrees of freedom.
Scale 2 = Scale developed using item-to-scale-score correlations to determine item selection.
Scale 3 = Scale developed using factor analysis with an orthogonal solution. Figures reported in the column for both this scale and Scale 4 are factor loadings on the first factor.
Scale 4 = Scale developed using factor analysis with an oblique solution.
Scale 5 = Weighted scale developed from factor score coefficients derived from an orthogonal factor analysis. Figures reported in the column for both this scale and Scale 6 are the factor score coefficients computed for the first factor.
Scale 6 = Weighted scale developed from factor score coefficients derived from an oblique factor analysis.

TABLE 4

Attitudes Toward the Law

	Scale 1	Scale 2	Scale 3	Scale 4	Scale 5	Scale 6
Item 1	3.87	.287	.137*	.126*	.028	.158
Item 2	11.90	.563*	.112*	-.049*	-.070	.283
Item 3	12.03	.570	.125*	-.032*	-.056	.294
Item 4	9.42	.516	.138*	-.005*	-.041	.293
Item 5	11.16	.517	.451*	.479*	.153	.455
Item 6	13.57	.605	.685	.727	.347	.691
Item 7	7.92	.471*	.368*	.365*	.112	.398
Item 8	15.08	.619	.662	.691	.315	.680
Item 9	13.24	.637	.391*	.319*	.109	.491
Item 10	6.82	.415*	.218*	.176*	.038	.275
Item 11	10.79	.568	.567*	.591*	.222	.585

*Indicates that the item was not included in the computation of the final scale score.
Scale 1 = Scale developed using t-tests to determine item selection. Figures reported in the column are critical ratios obtained with 190 degrees of freedom.
Scale 2 = Scale developed using item-to-scale-score correlations to determine item selection.
Scale 3 = Scale developed using factor analysis with an orthogonal solution. Figures reported in the column for both this scale and Scale 4 are factor loadings of the first factor.
Scale 4 = Scale developed using factor analysis with an oblique solution.
Scale 5 = Weighted scale developed from factor score coefficients derived from an orthogonal factor analysis. Figures reported in the column for both this scale and Scale 6 are the factor score coefficients computed for the first factor.
Scale 6 = Weighted scale developed from factor score coefficients derived from an oblique factor analysis.

With regard to the drug scale, there are marked discrepancies in which items each analytical technique defined as appropriate for inclusion in the several final scales. Interestingly, the frequently employed t-test technique showed that all items were discriminatory. Each of the critical ratios reported in Table 3 is significant at less than the .001 significance level. Similarly, all of the item-to-scale-score correlations allow the rejection of the null hypothesis that the true correlation was equal to zero with the probability of a Type I error being less than .001 in all cases. As indicated in the table, however, items five and eight were deleted from the final scale because the magnitudes of the correlations were not equal to or greater than the pre-set level of .50. Both factor analytic techniques led to the exclusion of all but items six, seven, and nine, although it should be noted that both the orthogonal and oblique solutions specify the same variations as having strong factor loadings with the first factor. The factor score coefficients were calculated on all items in the set of eleven that we began with, but the coefficients derived from the othogonal solution specified negative weights from items five, eight, ten and eleven. The oblique solution assigned positive weights to all eleven items.[1] Thus, our examination of the drug attitudes

[1] Although a negative factor score coefficient does indicate that an item should be deleted from the computation of a final scale score, it clearly compensates for retaining a non-discriminatory item and may have other advantages when the final scale is employed in further analysis (cf. Nie, Bent, and Hull, 1970: 226-227).

scale shows that the different techniques yield quite different final scales. The only real commonality noted is that items six, seven, and nine were selected for inclusion by each of the procedures we employed.

The patterns noted in Table 3 are virtually duplicated in Table 4. The t-test technique required the exclusion of no items; three items did not meet the required level of item-to-scale correlation; nine of the eleven initial items failed to load on the first factor in both factor analyses; and three items were assigned negative factor score coefficients when an orthogonal rotation was employed as compared with no negative coefficients being assigned when an oblique rotation was used. Further, the two items which did have adequately high factor loadings in both factor analyses were also defined as appropriate for inclusion in each of the other final scales.

In short, Tables 3 and 4 rather clearly demonstrate that the several techniques of item analysis under examination do not yield comparable sets of items for inclusion in final summated scales. Indeed, the differences are quite extreme if one compares the t-test techniques with either of the factor analytic techniques.[2] This, in itself, is not

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[2] On the other hand, this is in some ways a difficult if not unfair comparison to make in the sense that we only selected items in the factor analysis segment of our analysis which yielded significant factor loadings on the first factor that was produced. In order to adjust for this bias, we also created additional scales from both sets of attitude items using both factor analysis techniques that called for us to sum the item weights of those items which had factor loadings of .50 or greater on the first and second factors that were produced in the factor analyses.

necessarily problematic. A good scale with a small number of items is certainly to be preferred over an inadequately constructed but larger measure. Unfortunately, what one should accept as a good scale is quite difficult to define, but the power of an attitude scale to predict behavior certainly provides one important criterion. Thus, we also computed correlations between each of the several attitude scales which we constructed and two measures of self-reported student drug use. One drug use variable is defined by responses to a question which simply asked whether or not the respondent had ever used any drug for a non-medical purpose; the other by a question on the frequency of drug use that was scored on a five-point scale which ranged from daily to not at all. The results of this aspect of our analysis are reported in Tables 5 and 6.

TABLE 5

Intercorrelations Between Attitude Toward
Drug Scales and Drug Use Variables

	Scale 1	Scale 2	Scale 3	Scale 4	Scale 5	Scale 6	Drug Use	Frequency of Drug Use
Scale 1	1.000	0.972	0.944	0.823	0.870	0.918	0.581	0.335
Scale 2		1.000	0.967	0.866	0.902	0.947	0.584	0.347
Scale 3			1.000	0.955	0.962	0.969	0.593	0.369
Scale 4				1.000	0.957	0.897	0.540	0.365
Scale 5					1.000	0.968	0.543	0.381
Scale 6						1.000	0.571	0.368
Drug 1							1.000	0.089
Drug 2								1.000

Scale 1 = Initial summated scale. This is also the final scale derived from t-test technique.
Scale 2 = Final scale after item selection based on item-to-scale-score correlation.
Scale 3 = Weighted scale using weights derived from oblique factor solution.
Scale 4 = Weighted scale using weights derived from orthogonal factor solution.
Scale 5 = Final scale based on items with significant loadings on first factor. Identical results obtained from both orthogonal and oblique solution.
Scale 6 = Final scale based on summation of unweighted item responses to items which loaded on both factors one and two. Identical results were obtained from both orthogonal and oblique solutions.
Drug 1 = Drug use?
Drug 2 = Frequency of drug use.

TABLE 6

Intercorrelations Between Attitude Toward the Law Scales

	Scale 1	Scale 2	Scale 3	Scale 4	Scale 5	Scale 6	Scale 7	Drug Use	Frequency of Drug Use
Scale 1	1.000	0.967	-0.909	0.786	0.764	0.697	0.919	-0.351	-0.209
Scale 2		1.000	-0.899	0.772	0.780	0.728	0.948	-0.372	-0.221
Scale 3			1.000	-0.968	-0.947	-0.409	-0.849	0.288	0.193
Scale 4				1.000	0.957	0.170	0.703	-0.212	-0.152
Scale 5					1.000	0.263	0.789	-0.220	-0.168
Scale 6						1.000	0.801	-0.350	-0.190
Scale 7							1.000	-0.360	-0.225
Drug 1								1.000	0.089
Drug 2									1.000

Scale 1 = Initial summated scale. This is also the final scale derived from t-test technique.
Scale 2 = Final scale after item selection based on item-to-scale-score correlation.
Scale 3 = Weighted scale using weights derived from oblique factor solution.
Scale 4 = Weighted scale using weights derived from orthogonal factor solution.
Scale 5 = Final scale based on items with significant loadings on first factor. Identical results obtained from both orthogonal and oblique solution.
Scale 6 = Final scale based on summation of unweighted item responses to items which loaded on both factors one and two. Identical results were obtained from both orthogonal and oblique solutions.
Scale 7 = Scale based on summation of responses to items which loaded on both the first and second factors. Identical results were obtained from both the orthogonal and oblique solutions.
Drug 1 = Drug Use?
Drug 2 = Frequency of drug use.

The effect of the various item selection and item weighting procedures that we employed was unexpected, but quite consistent. First, the intercorrelations among the several scales derived from each set of items are uniformly high in virtually every case.[3] Indeed, the intercorrelations are sufficiently high that one would not expect the predictive utility of the scales to vary a great deal even if their associations were with the two behavior variables not also shown in the tables. This is reflected most clearly in Table 5 when the correlations between the various scales and the two drug use variables are examined. Table 6 reflects a bit less consistency, particularly with regard to the correlations between the scales and the initial drug use variable, but the variations are not really striking even there.

There findings are awkward to interpret, in part because each of the scales performs in roughly the same manner when used as a predictor of the two dependent variables, but also because the item composition of the scales showed so much variation that we anticipated more pronounced differences than those observed in the two tables. Several points seem relevant, however. First, it can certainly be argued that Likert-type attitude measures perform more reliably when the number of attitude statements is reasonably large. It has been suggested,

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[3] Averages were computed for each set of intercorrelations in order to determine the overall level of association between the scales (Mueller, Schuessler, and Costner, 1970: 274-276). The average intercorrelation among the drug scales is .928; among the law scales .734.

for example, that the final scale should contain ten or more statements, particularly when the items purport to have a high level of "face validity" (cf. Francis, 1967: 208). The factor analytic techniques did not come close to conforming with this general rule even when the items which had significant factor loadings on the first two factors were merged into a single summated scale. Second, it would also appear that an item selection procedure which utilizes all or most of the available data is to be preferred over one which uses only extreme groups in a sample. This implies that the t-test technique is of dubious utility, a fault which seems amplified by the fact that the t-tests did not appear to have any discriminatory power in the analysis of our data. Third, if all other things are equal, it is difficult to justify the additional time and effort required for the construction of a complex scale when a relatively simple measure works just as effectively. Apart from whatever practical advantages that accrue from reporting a fairly complicated scale in an article being reviewed by journal referees who are too often more impressed by the cuteness than the actual utility of such statistical machinations, our analysis questions the merits of measures based on factor score coefficients.

Given these considerations and the consistently strong performance of the two measures that we constructed on the basis of item-to-scale-score procedure, we are led to conclude that this simple and easily interpreted correlational technique is

at least as efficient as are the other perspectives we examined. Moreover, the predictive value of the two scales developed in this fashion is as good as if not better than the alternatives presented.

APPENDIX A

Attidues Toward Drugs

		AGREE Strongly	Mildly	Neither	DISAGREE Mildly	Strongly
1.	Any drug which has no addictive property should be legalized	1	2	3	4	5
*2.	Drug use leads people to engage in criminal behavior	1	2	3	4	5
3.	Many drugs allow the user to gain insight into his own personality and, on a broader scale, an understnading of the problems of others	1	2	3	4	5
*4.	Emotionally mature people from good homes know better than to use illegal drugs	1	2	3	4	5
5.	People seldom engage in behavior while taking drugs that they wouldn't engage in when not under the influence of drugs	1	2	3	4	5

	AGREE Strongly	Mildly	Neither	Mildly	DISAGREE Strongly
*6. Regardless of the effects of various drugs, the fact that drug use is illegal should keep people from using drugs . .	1	2	3	4	5
*7. Drugs should only be used in the course of treating a medical problem	1	2	3	4	5
8. It is wrong to make drugs which are non-habit forming and which have no adverse physical effect illegal . . .	1	2	3	4	5
*9. People who use drugs are basically weak personalities looking for escape . .	1	2	3	4	5
10. The decision to either use or not use drugs should be left up to the individual	1	2	3	4	5
11. Since so little is known about the physical effects of drugs, people should really withhold judgement on whether drug use is good or bad	1	2	3	4	5

* On both sets of items, indicates reverse item scoring.

Attitudes Toward the Law

		AGREE Strongly	Mildly	Neither	Mildly	DISAGREE Strongly
1.	Though it is our duty to obey all laws, we can try to have them changed	1	2	3	4	5
2.	It is difficult to break the law and keep one's self-respect	1	2	3	4	5
3.	The individual who refuses to obey the law is a menace to civilization . .	1	2	3	4	5
4.	No man can violate the law and be my friend	1	2	3	4	5
*5.	The law is for the poor to obey and for the rich to ignore	1	2	3	4	5
*6.	The law is rotten to the core	1	2	3	4	5
*7.	Men are not all equal before the law . . .	1	2	3	4	5
*8.	Laws are so often made for the benefit of small selfish groups that a man cannot respect the law	1	2	3	4	5
9.	We should obey the law even though we criticize it	1	2	3	4	5
*10.	Individual laws are frequently unjust .	1	2	3	4	5
11.	The law is fundamentally sound in spite of mistakes by Congress and courts	1	2	3	4	5

* On both sets of items, indicates reverse item scoring

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