Economic and Social Review Vol. 8 No. 2

The Issue Differential: A Multidimensional Technique for Measuring Components of Attitudes Towards Social Issues

E. E. DAVIS

The Economic and Social Research Institute, Dublin

I INTRODUCTION

THE Semantic Differential (SD) technique, developed by Osgood, Suci and Tannenbaum (1957) is perhaps one of the most widely used instruments for tapping attitudes or perceptions towards a variety of objects. This is attested to by the fact that the basic reference to Osgood *et al.* (1957), is perhaps one of the most (if not *the* most) frequently cited references in the social psychological literature.

This widespread use certainly attests to the versatility of the technique. At the same time there are certain problems—one could perhaps even say dangers—associated with this extremely broad usage. The danger is that the technique is, in many cases, utilised indiscriminately; indeed, it is probably not an overstatement to say that the technique is often misused.

There are at least two senses in which the above statement can be said to hold. One has to do with the frequent practice of using a single SD scale to tap a given attitude or perception. As the reader may know, Osgood *et al.* (1957) found three basic factors which constitute the underlying structure of SD scales. These are the well-known factors of EVALUATION, POTENCY and ACTIVITY. Subsequent cross-cultural work (Osgood, 1964) has shown a remarkable stability or invariance in these three basic factors. However, factor analysis has, in addition to its capacity to reveal the underlying structure of a set of items, additional advantages. One of these has to do with the question which is of vital importance to all measurement techniques, namely, that of reliability. Osgood *et al.* (1957) have reported test-retest reliabilities of composite scores, based on five items which were factorially pure, ranging from 0·83 to 0·91; Davis (1966) has reported similar results. On the other hand, Davis (1966) has shown that the test-retest reliabilities of *single* SD scales range from about 0·20 to nearly 0 in some cases. When one is reminded of the well-known axiom that the coefficient

of validity cannot exceed the square root of the coefficient of reliability, the implication of these results become clear. If one is interested in validity, as one normally is in research, one can see why we apply a term as strong as "misuse" when results (and perhaps even decisions) are based on the use of single SD scales.

The other sense in which one can speak of a misuse of the SD technique stems from a frequent failure on the part of researchers to fully understand the factor analytic underpinnings of the technique. The cross-cultural invariance of the three well-known SD factors is based on the use of a set of 100 maximally heterogeneous noun concepts as stimuli. However, as Osgood (1962) has shown, when one is dealing with a *delimited* domain of stimuli, the resulting factor structure is likely to be different (and more differentiated). Osgood (1962) illustrated this point on the basis of some unpublished data by Ware (cf. Osgood, 1962) utilising person concepts as stimuli. The factor structure of SD scales used to judge person stimuli turned out to be quite different from (and more differentiated than) the classical three-factor solution. This finding, which went relatively unnoticed for some years, has more recently led to the development of a version of the SD technique which has come to be known as the Personality Differential. In addition to the work in the US (Osgood, 1962; Tzeng, 1972) this technique has now been cross-culturally replicated in Finland (Kuusinen, 1969), Great Britain (Warr and Haycock, 1970), Belgium (Hogenraad, 1972), Japan (Tanaka, Unpublished), and, most recently by Davis and O'Neill in Ireland (1977).

If factor structures differing from the three classical factors are obtained when using person stimuli, it would seem to follow that other domains of stimuli would likewise produce different factor structures. A class of stimuli which is frequently of interest to those in the area of attitude and opinion research is that of social issues. So far as we can determine from the published literature no extensive examination has been made of the factor structure of SD judgements of social issues, with the exception of a previous study by Davis (1966). It was the purpose of the present study to develop a set of SD scales specifically designed to tap perceptions of social issue stimuli—a technique which we have tentatively called the Issue Differential.

II METHOD

The method used to develop the Issue Differential with a Dublin sample was parallel to the technique which has been used cross-culturally to develop the Personality Differential, and was carried out in collaboration with Professor Osgood and his associates at the Center for Comparative Psycholinguistics at the University of Illinois.[1]

1. We should particularly like to express our appreciation to Dr Oliver C. S. Tzeng, Director of the Personality Differential Study, Center for Comparative Psycholinguistics, University of Illinois, Champaign/Urbana, Illinois.

1. Elicitation Phase

The first phase of the study involved eliciting qualifiers which subjects *(Ss)* in the Irish culture used to describe or qualify a number of social issue concepts. A sample of 28 issue concepts was developed, based on a content analysis of the preceeding three months' issues of the major Irish newspapers. The issue concepts were presented by our Institute's interviewers to a stratified random sample of 160 *Ss* selected from the Electoral Register for the Dublin area. The *Ss* were asked to supply *four* adjectives which, in their opinion, best described each issue. Most *Ss* were able to complete this task satisfactorily, although in some instances, for some stimuli, *Ss* were not able to readily supply as many as four adjectives. The final total of qualifiers elicited in this phase of the study was 5,238.

The next step involved a reduction of this mass of data. An index utilising the information theory measure H was calculated for each qualifier, based on the frequency of the qualifier and the number of different issue concepts eliciting a particular qualifier. This measure gives the greatest weight to the most frequent *and* most diverse qualifiers. The qualifiers were thus ranked from highest to lowest in terms of H scores. By applying the correlation statistic phi the distribution of the nouns of each qualifier was correlated with every prior qualifier in the rank list. The purpose of this correlation procedure was to eliminate those qualifiers which have a high correlation with (i.e., a similar distribution of usage to) a preceeding qualifier (i.e., a qualifier which had a higher H score). From these analyses of the 5,238 elicited qualifiers, it was possible to extract a set of 73 high frequency, high diversity, and relatively independent qualifiers.

The next step involved eliciting a bi-polar opposites for each qualifier on this final list. An Opposites Elicitation form was administered to a group of 21 judges, consisting of colleagues at our Institute and a sister Institute in Dublin. A 70 per cent inter-judge agreement criterion was applied; each qualifier which attained this level was chosen with its opposite as a scale. The scales which emerged from these elicitation procedures were augmented by the addition of 12 "pan-cultural" scales supplied by the Center for Comparative Psycholinguistics as marker variables for purposes of cross-cultural comparisons, and an additional 9 marker variables taken from the previous study by Davis (1966). There was, of course, some overlap between the elicited scales and the marker variables, and the final total of scales for use in the main study was 58.

2. Main Study

The purpose of the main study was to obtain responses from an Irish sample on the 58 Issue Differential scales to 32 issue stimuli (a slightly modified and augmented version of the original list of 28 stimuli), in order to (a) factor analyse the scale responses so as to determine the structure of the ratings of issue concepts in this culture, and (b) perform analyses of variance on the subject characteristics (age, sex, status), so as to indicate the demographic determinants of ratings of issue concepts in this culture.

Since the task of rating 32 stimuli on 58 scales (involving a total of 1,856 judgements) required an average of two and a half hours to complete, it was not feasible to conduct this phase of the study in the field with interviewers. A stratified sample of 125 paid volunteers were scheduled and brought into the Institute in groups to serve as *Ss*. The *Ss* were recruited on the basis of a mimeographed letter sent to a random sample of 400 names drawn from the Electoral Register for Dublin. In this manner, a total of 119 valid questionnaires was obtained for use in further analyses.

III RESULTS

As we have indicated earlier, the main purpose of this study was to explore the factor structure of SD scales used to judge issue stimuli, as a first major step in the development of an Issue Differential. The 58 scale variables were correlated over the 3,808 observations generated by the responses of 119 *Ss* to the 32 stimuli. The resulting 58×58 correlation matrix was factor analysed by means of a Principal Components analysis, and the Principal Axis factors which were extracted were rotated orthogonally to simple structure on the basis of the Varimax criterion (Kaiser, 1958). A six-factor solution seemed optimal. Table 1 presents the highest loading scales from each of the six factors, together with a tentative label for each factor.

Factor I is clearly the ubiquitous EVALUATION factor, and, as is typically the case, accounts for the largest amount of variance. Obviously, in further research it would be possible to use considerably fewer scales to adequately tap this dimension, which would also correct, to some extent, the gross imbalance in the amount of variance accounted for by this factor.

Factor II has been tentatively labelled SALIENCE, an interpretation which would appear to constitute a reasonable explanation of that which the high loading items on this factor seem to have in common. It is interesting to note that a separate ACTIVITY factor does not emerge from this analysis, but that the Slow-Fast scale loads on this factor. It starts to become clear that when this specialised domain of issue stimuli is used as a frame of reference, factors emerge which are very different from the classical three factors which result from the use of a very heterogeneous, generalised set of stimuli.

Factor III was initially called simply "Difficulty", but the high loadings for the scales Costly-Cheap and Controversial-Non-Controversial seem to give it a more general character and we have tentatively labelled this factor UNFEASIBILITY. One could see how this set of scales could apply to social issues, particularly those involving policy applications.

Factor IV would seem to suggest a kind of "Potency", but not the generalised "Potency" which comes out in the classical three-factor structure. The high loading for the scale Controlled-Uncontrolled, together with the other scales loading on this factor, suggest that this dimension may be a way of judging

Table 1: *Results of factor analysis of 58 issue differential scales: selected scales from 6 Varimax rotated factors based on the responses of a stratified Dublin sample to 32 issue stimuli. (N = 119)*

Scales	*Varimax rotated loadings*
FACTOR I: EVALUATION	
Useless-Useful	·86
Necessary-Unnecessary	−·85
Bad-Good	·90
Undesirable-Desirable	·88
Unfair-Fair	·87
Worthy-Unworthy	−·89
Wise-Foolish	−·89
Correct-Incorrect	−·91
Favourable-Unfavourable	−·89
Undeserving-Deserving	·86
Pct. Variance: 42·4. Cum. Pct. Variance: 42·4	
FACTOR II: SALIENCE	
Small-Large	−·53
Muted-Vivid	−·60
Rich-Poor	·41
Superficial-Profound	−·52
Delicate-Sturdy	−·51
Slow-Fast	−·49
Pct. Variance: 4·5. Cum. Pct. Variance:46·9	
FACTOR III: UNFEASIBILITY	
Hard-Soft	−·46
Costly-Cheap	−·63
Controversial-Non-Controversial	−·57
Easy-Difficult	·52
Pct. Variance: 3·3. Cum. Pct. Variance: 50·2	
FACTOR IV: POTENCY WITH CONTROL	
Weak-Strong	·47
Controlled-Uncontrolled	−·72
Organised-Disorganised	−·67
Corrupt-Honest	·40
Believable-Unbelievable	−·43
Pct. Variance: 5·2. Cum. Pct. Variance: 55·4	
FACTOR V: FAMILIARITY	
Familiar-Unfamiliar	·63
Near-Far	·68
Pct. Variance: 3·2. Cum. Pct. Variance: 58·7	
FACTOR VI: IMPORTANCE	
Unimportant-Important	·57
Irrelevant-Relevant	·57
Pct. Variance: 2·6. Cum. Pct. Variance: 61·3	

certain issues with policy implications, or, more generally, mechanisms or structures for implementing policies. (It might be added that not all of the stimuli were, strictly speaking, "Issues"; some of them were designations of socio-political organisations or systems, e.g., the EEC, Communism, the Provisional IRA, etc.) As is often the case with factor analytic results, it is reasonably easy to see how the items of a factor could load together, but sometimes rather difficult to find a label which adequately captures that which the items have in common; thus, we have tentatively named this factor POTENCY WITH CONTROL.

Factor V is clearly interpretable as FAMILIARITY and is a very clear replication of one of the three factors isolated by Davis (1966). Of course, it is disappointing that there are only two high loadings on this factor. However, this is one of the risks that one runs in carrying out a purely empirical exploratory study of this nature. On the one hand, by relying primarily upon "raw" material which is more or less spontaneously emitted by real people, one has some confidence that a factor which emerges from such a procedure is reasonably "real". On the other hand, once one has discovered that such a factor exists, it is relatively easy, *ex post facto,* to create further items which would presumably tap this dimension. In further research, which we will be carrying out shortly, it will be possible to expand upon such factors. Naturally, we will obtain these answers from a new stratified random sample and then factor analyse the scales again, to ascertain whether our hypotheses that certain scales are measuring or tapping certain dimensions can be empirically verified.

Factor VI is clearly interpretable as tapping IMPORTANCE and is also a complete replication of one of the three factors isolated by Davis (1966)—the third factor which emerged from the previous study was the ubiquitous EVALUATION. Again, it is disappointing that only two items have high loadings on this factor. However, the fact that these two factors have been replicated with a sample from a different culture (the earlier study was conducted with American *Ss*), utilising entirely different issue stimuli, is quite encouraging. As we indicated in connection with the discussion of Factor V, we will, in our subsequent research, develop further scales for this factor and empirically test the hypothesis made thereby.

Table 2 presents means and standard deviations of composite scores for a few selected issues[2] on the 6 factors (the ranges are from 1–7, in accordance with the usual SD format). The purpose of this table is to provide a certain feeling for the data in a somewhat more "raw" form, and also to illustrate some of the similarities and differences between the factors, with a view toward illustrating the usefulness of identifying different factors or dimensions.

Due to space limitations we shall confine ourselves to pointing out just a few comparisons. The fourth and fifth issues in this table (Wealth Tax and Contraception) illustrate a tendency which is manifest with many of the issue stimuli, namely, when an issue is relatively high on EVALUATION it is also

2. For more complete results on all of the issues studied further information may be obtained from the author.

Table 2: *Means and standard deviations of composite scores for selected issues on 6 issue differential factors. (N = 119)*

Issue		*Factor I evaluation*	*Factor II salience*	*Factor III unfeasibility*	*Factor IV potency with control*	*Factor V familiarity*	*Factor VI importance*
Reunification of Ireland	Mean	4·98	4·02	5·86	4·33	3·85	5·29
	SD	1·78	1·10	0·97	1·80	1·62	1·85
Provisional IRA	Mean	2·61	4·59	5·79	3·96	4·84	4·90
	SD	1·81	1·18	1·07	1·56	1·67	2·07
Communism	Mean	2·84	3·98	5·16	3·84	3·81	4·25
	SD	1·72	1·14	1·13	1·60	1·54	2·09
Introduction of a wealth tax in Ireland	Mean	5·69	4·50	4·71	4·92	4·40	6·02
	SD	1·53	0·96	1·12	1·43	1·52	1·34
Legalisation of contraception	Mean	5·47	4·34	4·56	4·90	4·66	5·98
	SD	1·77	0·94	1·15	1·53	1·56	1·55
Women's liberation	Mean	4·91	4·27	4·86	4·64	4·63	4·57
	SD	1·83	1·10	1·16	1·55	1·48	2·07
Poverty	Mean	1·97	3·65	5·45	3·05	5·11	6·04
	SD	0·97	0·85	1·01	1·16	1·55	1·47
Restoration of the Irish language	Mean	4·14	3·48	5·50	3·96	3·85	3·88
	SD	1·97	1·14	1·12	1·57	1·54	2·21

usually high on IMPORTANCE. On the other hand, the second and third issue stimuli (Provisional IRA and Communism), and to an even greater extent, the seventh issue (Poverty) show that it is equally possible to have relatively low EVALUATION combined with relatively high IMPORTANCE (a mean difference of approximately 0·5 of a scale point would be significant well beyond the $p < 0{\cdot}01$ level). A further interesting comparison may be seen in the case of the first issue (Reunification of Ireland), which is rated somewhat positively on EVALUATION (significantly above the theoretical mean of 4·0), but is at the same time rated quite high on UNFEASIBILITY. Finally, we might point again to the second issue (Provisional IRA), which illustrates that a stimulus can be quite low on EVALUATION, but at the same time be rated significantly higher on POTENCY WITH CONTROL.

Many other interesting comparisons could be made, but a careful inspection of the data presented in Table 2 illustrates quite clearly that, in order to fully understand peoples' attitudes and perceptions of social stimuli, it is necessary to take into account their ratings on the various dimensions which they apparently use (often quite differentially) in rating such stimuli. One can see that a uni-dimensional approach which merely takes into account a person's rating of a stimulus along a global Positive-Negative continuum can lead to results which are at best incomplete, and often quite misleading.

In addition to the above results, analyses of variance were carried out, based on the differences in the subject characteristics of sex, age, and occupational status. More detailed findings based on these analyses will be presented at a later stage when further work has been conducted with this technique. For now we shall merely comment upon the fact that these analyses of variance results tend to provide a concurrent validation of the technique, in light of the expected directionality of the results in terms of the subject characteristics mentioned.

Finally, we might say a brief word concerning the reliability and validity of this technique as a measuring instrument. Although we do not yet have data on the reliability and validity of the specific scales reported here, as we indicated earlier, the work by Osgood *et al.* (1957), Davis (1966), and others, have shown that the use of composite scores based on factorially pure sets of items leads to highly satisfactory test-retest reliabilities. Davis (1966) has shown that even the use of two factorially pure items in a composite score leads to a significant increase in the reliability over a single item; furthermore, as we have indicated, we intend to develop this instrument further so that we expect to have three or more factorially pure items for each factor. Thus, it may be assumed that this instrument, when perfected, will be one that could be expected to yield quite satisfactory test-retest reliabilities.

Pending the collection of further data concerning the validity of this instrument, we might refer to results concerning the validity of similar scales developed in the preliminary work by Davis (1966). In work done by Davis and Triandis (1971), involving experimental simulation of negotiations between groups in conflict, such measures showed significant *predictive* validities, whereby

the dependent variables consisted of measures of the outcomes of such experimental negotiations. In other studies (e.g., Davis and Goldstein, 1974; Goldstein and Davis, 1972) the earlier versions of these types of scales have shown a high degree of *concurrent* validation when compared with results of measures of the behavioural component of interpersonal attitudes, a technique known as the Behavioural Differential (Triandis, 1964). More recently, Davis (1975) has developed a set of Behavioural Differential scales within an Irish context. Two studies are currently underway in which both the Irish Behavioural Differential scales developed by Davis (1975) and the Irish Issue Differential scales reported in the present study, are being used concurrently. Thus, we shall shortly have some information concerning the concurrent validity in the use of these scales. Obviously, however, further work needs to be done which would be specifically designed to examine the test-retest reliability and the predictive validity of the scales constituting this instrument.

IV SUMMARY

This study was designed to illustrate the techniques for the development of specialised sets of Semantic Differential Scales appropriate for judging stimuli of a social issue type—a technique which we will call the Issue Differential. Further research is underway which is designed to perfect this instrument and can be expected to result in an usable, and highly sensitive, multi-dimensional technique for tapping attitudes towards social issue stimuli. This work has been done in Ireland with a Dublin sample, and we would welcome any interest which colleagues in other countries might have in collaborating with us, with a view towards cross-cultural replications of this technique.

REFERENCES

DAVIS, E. E., 1966. *A Methodological Study of Behavioural and Semantic Differential Scales Relevant to Intercultural Negotiations.* Technical Report # 32, ONR Contract # 177–472, Nonr-1834 (36). Urbana: University of Illinois.

DAVIS, E. E., 1975. *A Study of the Structure and Determinants of the Behavioural Component of Social Attitudes in Ireland.* Dublin: The Economic and Social Research Institute, Paper No. 83.

DAVIS, E. E. and GOLDSTEIN, M., 1974. "Race, Belief and Personality as Determinants of Behavioural Intentions". *Proceedings of the 82nd Annual Convention of the American Psychological Association.* New Orleans.

DAVIS, E. E. and MARY O'NEILL, 1977. *The Irish Personality Differential: A technique for measuring affective and cognitive dimensions of attitudes toward persons.* Dublin: The Economic and Social Research Institute, Paper No. 88.

DAVIS, E. E. and H. C. TRIANDIS, 1971. "An Experimental Study of Black-White Negotiations". *Journal of Applied Social Psychology,* Vol. 1, 240–262.

GOLDSTEIN, M. and E. E. DAVIS, 1972. "Race and Belief: A Further Analysis of the Social Determinants of Behavioural Intentions". *Journal of Personality and Social Psychology,* Vol. 22, 346–355.

HOGENRAAD, R., 1972. "La Personnalites Comme Construction Semantique Universelle et Culturelle". *International Journal of Psychology*, Vol. 7 (1), 1–11.

KAISER, H. F., 1958. "The Varimax Criterion for Analytic Rotation in Factor Analysis". *Psychometrica*, Vol. 23, 187–200.

KUUSINEN, J., 1969. "Affective and Denotative Structures of Personality Ratings". *Journal of Personality and Social Psychology*, Vol. 12, 181–199.

OSGOOD, C. E., 1962. "Studies on the Generality of Affective Meaning Systems". *American Psychologist*, Vol. 17, 10–28.

OSGOOD, C. E., 1964. "Semantic Differential Technique in the Comparative Study of Cultures". *American Anthropologist*, Vol. 66, 171–200.

OSGOOD, C. E., G. J. SUCI and P. H. TANNENBAUM, 1957. *The Measurement of Meaning*. Urbana: University of Illinois Press.

TRIANDIS, H. C., 1964. "Exploratory Factor Analyses of the Behavioural Component of Social Attitudes". *Journal of Abnormal and Social Psychology*, Vol. 68, 420–430.

TZENG, O., 1972. *Differentiation of Affective and Denotative Meaning Systems in Personality Ratings Via Three-Mode Factor Analysis*. Urbana: University of Illinois, Unpublished Ph.D. dissertation.

WARR, P. B. and V. HAYCOCK, 1970. "Scales for a British Personality Differential". *British Journal of Social and Clinical Psychology*, Vol. 9, 328–337.