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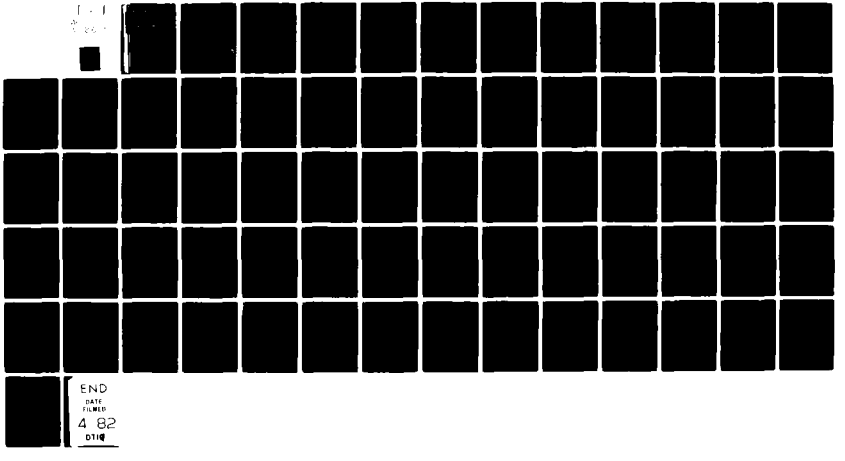

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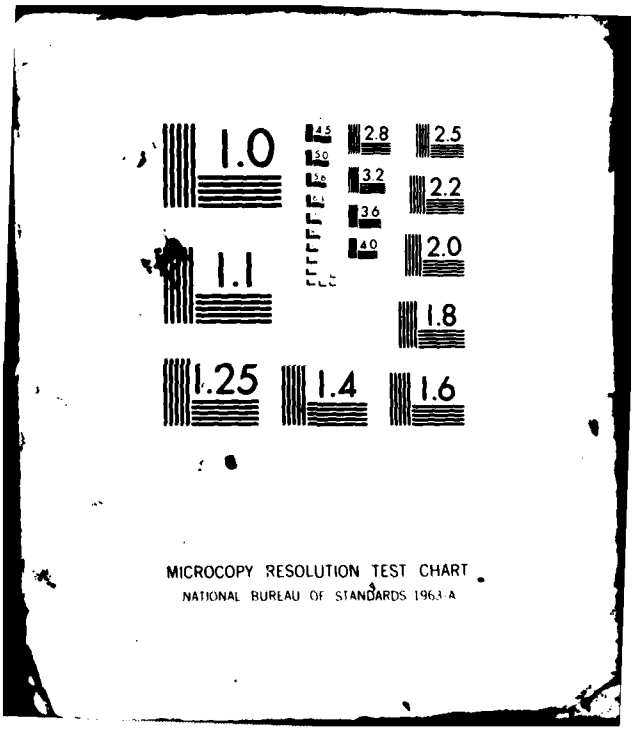
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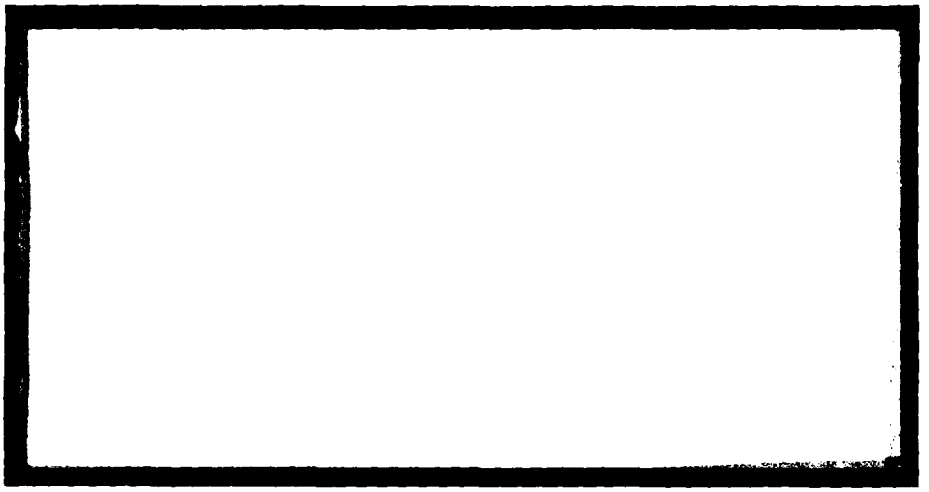
PERSONNEL TECHNOLOGY

AN EXAMINATION OF HISPANIC AND GENERAL POPULATION PERCEPTIONS OF ORGANIZATIONAL ENVIRONMENTS

(Harry C. Triandis, Principal Investigator)



DEPARTMENT OF PSYCHOLOGY
UNIVERSITY OF ILLINOIS
URBANA-CHAMPAIGN, ILLINOIS 61820

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LOCUS OF CONTROL AMONG MAINSTREAM AND HISPANIC NAVY RECRUITS: A METHODOLOGICAL AND SUBSTANTIVE STUDY

Chi-chiu Harry Hui

Harry C. Triandis

Bei-Hung Chang

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A multidimensional scaling method was used as a possible way to establish and improve an instrument for measuring locus of control cross-culturally. Four subscales, corresponding to Collins' (1974) factors, were isolated.

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Of these, the Politically Responsive-Unresponsive World subscale was found to be lacking in cross-cultural validity for comparisons of Mainstream and Hispanic Navy recruits. The more traditional methods of comparing factor structures and validating by nomological network were also used and compared with the multidimensional scaling method. Substantively, 79 Mainstream and 82 Hispanic Navy recruits were compared on the three "usable" subscales to investigate the relative effects of acculturation into Mainstream culture and non-conformity on locus of control beliefs. No significant differences were found. Acculturation was unrelated to locus of control, except for the Just-Unjust World subscale, in which the relation was curvilinear. In addition, bicultural Hispanics were more external than the less bicultural Hispanics on the Difficult-Easy World subscale.

Executive Summary

Internal locus of control is a person's view that outcomes (e.g., rewards or punishments) are the results of what he does; external locus of control is the view that outcomes are the results of events outside the person's immediate control (e.g., luck, fate, task difficulty). It is a variable of considerable importance in explaining the way people react to tasks, to success and failure, and to other work-relevant situations. This paper investigated the question whether Hispanic Navy recruits are similar or different to Mainstream recruits in their internal-external orientation. Two other variables were also examined: the degree of acculturation of the Hispanics (i.e., the extent to which they have adopted Mainstream norms and values) and the degree of nonconformity to Hispanic norms.

In comparing responses of cultural groups to particular items there are a number of approaches each of which has some advantages and disadvantages. In this study we tried factor analysis, multidimensional scaling, and validation via a nomological network of relationships. There was a consistent finding: the Hispanics have a more complex view of Political Internality-Externality than the Mainstream subjects, suggesting that it is methodologically indefensible to compare the two ethnic groups on this dimension. There were three other dimensions, one of which was clearly comparable across ethnic groups and the other two could be compared with caution. Comparisons on these dimensions showed no differences between Hispanic and Mainstream subjects.

The way the Navy is recruiting Hispanics there are no differences between Hispanic and Mainstream subjects in locus of control.

Introduction

The construct "locus of control" refers to a generalized expectancy about the relation between one's action and the ensuing reward or punishment. The generalized expectancy that reinforcements are contingent on one's own action is called internal locus of control while the expectancy that there is no such link is called external control. Thus, when the reinforcements are perceived as depending mostly upon other factors, such as fate, a person is characterized as having an external locus of control.

This concept has entered many areas of psychology. It has been studied as a predictor or moderator of many relationships within the domain of social interaction. The bulk of the research appears to support the utility of this concept in psychological research.

But is this concept equally useful in predicting behaviors in cultures that are not Anglo-Saxon? To date there are no less than 70 articles reporting cross-cultural research in this area (Hui, in press). Most researchers have focussed on a descriptive comparison between two or more cultures along this dimension, and found cross-cultural differences that can be interpreted in a variety of ways. However, the body of research contains many inconsistent findings. There does not seem to be a clear pattern of findings, and thus cross-cultural researchers have not yet accepted this construct as useful in the description, explanation and prediction of human behavior in non-Anglo-Saxon cultures. This study is designed to investigate certain methodological issues involved in applying this concept to non-Anglo-Saxon samples. Furthermore, the study will provide

substantive information concerning this construct among Hispanic Americans.

Past research on Central and South American populations has presented inconsistent findings. For example, it was reported that Mexican (Kagan, 1976) and Puerto Rican (Pehazur & Wheeler, 1971) children were highly external. Castro (1975) also found higher externality among Mexican-American unemployables than among their Mainstream counterparts. But there are also reports of no differences (e.g. Alvarez and Pader, 1978; Cole, Rodriguez, and Cole, 1978; Garza and Ames, 1974; Jessor, Graves, Hanson, and Jessor, 1968) and even findings that Mainstream subjects (i.e., white, Anglo-Saxon, United States natives) were more external than other ethnic groups (e.g., Cole and Cole, 1974; 1977).

A closer look at this literature suggests a plausible explanation for these inconsistencies -- differences in education might have played a major role. Studies that employed student subjects reported either no difference among the groups, or that the Mainstream subjects were more external. For the Hispanics, the factor of education can be differentiated into two aspects: (1) as a cause of greater acculturation to the Mainstream culture, and (2) as a sampling variable, according to which those Hispanics who are more educated are not representative of Hispanics in general; one might assume that they have norms which are inconsistent with the norms of most Hispanics.

Acculturation is the gradual identification with a new set of norms, in this case those of the Mainstream in the United States, and eventually it leads to the complete internalization of these norms.

Being a non-conformist in one's culture, on the other hand, involves actively rejecting the culture's values and patterns of behavior. For many Hispanics, education (usually in the Anglo system) facilitates exposure to a new set of cultural norms (acculturation). Choosing to be educated often requires a positive attitude toward mathematics, science and other topics that are of little importance within a traditional Hispanic community. It may be that such action is indicative of the persons' non-conformity with respect to Hispanic traditional culture. This notion of nonconformity is close to the "counternormative plan" which Cole and Cole (1974, 1977) employed to explain the internality observed among Hispanic college women. It would be interesting to disentangle these two factors which were completely confounded in previous research. While acculturation and non-conformity are undoubtedly correlated, it may be possible to keep the two constructs relatively separate and to study the relative strengths of acculturation and non-conformist tendencies in determining an internal outlook. How this can be done will be described in a later section.

Questions can also be raised concerning the functional equivalence of the control orientation across the cultures that are to be compared. It is doubtful that the construct can be assumed to have the same meaning in both cultures when it is operationalized with the same instrument. In other words, the equivalence of operationalized constructs has to be demonstrated. One way to clarify this point is to examine the factor structure of subjects' responses to the specific items of the instrument. Available empirical evidence suggests that

Chicanos and Mainstream subjects do not share the same factor structure (Garza, 1977; Garza and Widlak, 1977), and hence global scores, are not equivalent. Also, some people are relatively external in one domain but internal in another (see, e.g., Rietz and Groff, 1972; Gaa and Shores, 1979). This inevitably raises the issue of unidimensionality versus multidimensionality. Discussions of cross-cultural methodology (e.g., Triandis, 1972; Triandis & Berry, 1980) have emphasized the importance of checking the dimensionality of measures in each culture, and comparing only those dimensions that are shared by the cultures being compared.

Multidimensional Scaling Analysis

The Etic-emic Dilemma

Our earlier discussion concerning the cross-cultural comparability of the construct and instruments can be understood better when placed in the wider context of the etic-emic dilemma (Berry, 1980). The two terms, derived from phonetic-phonemic in linguistics, have been widely used by cross-cultural researchers. The etic approach is characterized by a universalistic perspective toward the subject matter, and the researchers who follow this approach usually regard themselves as exploring universal relations. This is what psychologists usually do. On the other hand, the emic approach is characterized by a particular cultural perspective, and researchers who study behavior from this viewpoint try to theorize and operate within the system of one culture. This is typical among some anthropologists.

Both approaches are used in cross-cultural research. However, some psychologists use only an etic perspective and are thus criticized

as having blindly imposed Western concepts on phenomena in a non-Western culture. Triandis, Malpass and Davidson (1973) called this a pseudoetic approach because it is a Western emic masquerading as an etic. The emic researchers, on the other hand, have been criticized for not providing dimensions and concepts useful for cross-cultural comparison.

To maximize the advantage of these two conflicting desiderata scholars such as Berry (1969, 1980) have proposed a "derived etic" as the solution. According to this approach, researchers should first be aware of their own tendency to employ an "imposed etic", and remain open to new, unexpected data that might emerge in another culture. They should, furthermore, modify the etic categories in the direction of the cultures being studied. "If some of the etic is left, it is possible to note the categories or concepts that are shared by the behavior system previously known and the one just understood emically. Now a derived etic that is valid for making comparisons between behavior settings can be set up" (Berry, 1980, p.13).

Obviously the burden of developing a derived etic rests with the researchers. However, even if they are conscientious and immunized against ethnocentrism, they will still need additional tools to counterbalance their sometimes subjective and impressionistic judgments. If we are to begin with the existing concepts and instruments that psychologists in the past century have accumulated, we need a set of objective tools that can discriminate what is cross-culturally applicable from what is not. Here we are proposing the use of a new methodology, namely, a multidimensional scaling

procedure known as INdividual Difference SCALing (the INDSCAL method of Carroll and Chang, 1970) as the means to derive an etic that can appropriately be used in more than one culture.

INDSCAL and the IE Scale

The INDSCAL model (Carroll & Chang, 1970; Carroll & Wish, 1974) was originally designed for multidimensional scaling of individual differences in perception and judgment. (The model and the computer program are discussed in the Appendix.) Although this model has been used to study group differences (see, e.g., Wish, Deutsch, & Kaplan, 1976), its potentially interesting and important contribution to solving the etic-emic dilemma is generally unrecognized. As a matter of fact the term "subjects" as used in individual differences multidimensional scaling can correspond to "cultural groups" (if we are willing to assume, for the moment, that there is minimal within-group individual difference), and the stimuli can be individual items of an instrument, such as the items of the internal-external control scale. By fitting the model to the cultural groups' matrices of proximities among the scale items, we can obtain a number of dimensions, some of which may be shared by both Hispanics and Mainstream subjects, and some may be unique to only one cultural group. Thus, the internal structures of a test instrument, as applied to and perceived by several cultural groups, can be compared.

It should be noted that the INDSCAL model has both strengths and limitations for the present purpose. This way of comparing internal structures is somewhat similar to the ordinary factor analysis. (For an illustration of cross-cultural application of this procedure, see

Triandis, Vassiliou, and Nassiakou, 1968.) However, this latter procedure provides different sets of factor structures for different cultural groups, and renders comparison indirect and difficult. The INDSCAL approach, by contrast, forces all of the otherwise uncoordinated dimensions to be interlocked and anchored in a common Euclidean space, and hence enables examination of the similarity among dimensions. Moreover, it is relatively insensitive to quantitative differences among cultural groups on the items. Therefore, one does not risk confounding meaningful differences along comparable dimensions with differences in emic dimensions. On the other hand, the INDSCAL cannot provide new emic dimensions outside the existing conceptions and instruments being used. What it can do is only to extract the cross-culturally equivalent concepts from the emics. Hence, this model cannot replace the laborious tasks of anthropologists. It is only a supplement to these emic studies, although it will, if useful in the present study, redirect future cross-cultural application of other instruments for psychological measurement.

Validation by Nomological Network

To establish cross-cultural generalizability and comparability of a construct and instrument, examination of the scale's internal structure is not sufficient. The next step is to check if the relationships between locus of control and other psychological constructs are similar across cultures. In other words, one must ask: Are the nomological networks of the two cultures the same? One way of doing this is an extention of the ideas of convergent and discriminant validation (Cronbach & Meehl, 1955) to the domain of cross-cultural

comparison.

The usefulness of the extension can be illustrated by first considering the inadequacy of the one-shot mono-cultural (which is, in a loose sense, mono-method) inter-correlational approach to instrument validation. Suppose construct A and locus of control are related to one another within a theoretical framework, while construct B is conceptually and substantively distinct from the control orientation. Correlating the three measures, we can expect to get a positive correlation between 'a' (A operationalized) and 'lc' (locus of control operationalized), and zero correlation between 'b' (B operationalized) and 'lc'. Given only two known values, it is necessary to assume at least three relationships to know the rest. To be explicit, we may assume the three instruments used are valid measures of the constructs, and thus conclude that A, B and locus of control are in such relationships as posited. Or we may assume that a and b are good measures, and that B is unrelated to locus of control. Then we can conclude that the measure of locus of control is valid and that the control belief is positively related to construct A. On the basis of such data one cannot falsify any of the assumptions and/or inferences. Apart from this epistemological knot, the findings are not readily translatable into the cross-cultural research context, unless a similar procedure is followed in each cultures to be compared.

Though not absolutely flawless, replication on samples drawn from other cultures of interest increases the strength of this approach. At the very least it allows the inapplicability of the original assumptions and/or inferences for a different population to surface.

For instance, if the assumption that all three measures are cross-culturally valid is reasonable and if the pattern of correlation between the locus of control measure and the other measures turns out to be much stronger or much weaker for the Mainstream than for the Hispanic samples, the relationship among constructs must be inferred to be different for different cultural groups. Alternatively, we may infer that some of the measures lack cross-cultural validity, if we choose to believe in the universalistic nature of the control orientation in relation to other psychological constructs. At any rate, if data collected from a second culture is inconsistent with what has been collected from the first culture, we need to admit that either the measures or the constructs or both lack cross-cultural generalizability. Conversely, a pattern of inter-correlation which is consistent across all subgroups serves as reasonably strong evidence of similarity of meaning of the control orientation and the measuring instruments. (No distinction between the similarity of meaning of the construct and that of the instrument is made, for in this approach there is no way of separating one from the other.)

To do this one needs to first generate correlation coefficients between each of the groups of locus of control items and a set of psychological constructs. The set of correlation coefficients from one cultural group will be plotted against that from another for each of the clusters. Ideally, each of the correlation coefficients obtained from one groups should be equal to that obtained from the other group. Hence the coordinates would lie on the x=y line. Lack of cross-cultural construct validity of the locus of control dimension

would be indicated by the points' deviation from the x=y line.

The variables chosen for this extended procedure of convergent and discriminant validation included:

(1) socioeconomic status (SES);

(2) individual modernity (Inkeles & Smith, 1974);

(3) religiosity (Davis, Wrigley & Castelein, Note 1);

(4) value of work (Triandis, Ottati & Marin, Note 2);

(5) fear of success (Triandis, Ottati & Marin, Note 2);

(6) authoritarianism (F positive);

(7) authoritarianism (F negative);

(8) criticism of social institution (Davis et al., Note 1);

(9) moral liberalism (Davis et al., Note 1);

(10) tolerance for ambiguity (Budner, 1962);

(11) religious locus of control (Piersma, 1974); and

(12) supernaturalism (Rendall & Desrosiers, 1980).

Cross-cultural comparison of control belief

At least two conditions have to be met before the control belief can be compared cross-culturally. The INDSCAL analysis mentioned above has to demonstrate that there are at least some cross-culturally equivalent and measureable aspects of control belief. Such aspects have also to be validated by a nomological network to establish their conceptual/functional equivalence across cultures. Thence, we may proceed to investigate the relative effects of acculturation and non-conformist tendencies on this outlook on life.

Acculturation and non-conformity

It is useful to elaborate at this point the distinctions between acculturation and non-conformity. The former is an adoption of values, beliefs, and ways of life of another culture, whereas the latter is associated with a more individualistic outlook, and is linked to the self-reliant beliefs characteristic of internal locus of control. Hence, whether the acculturation process will make a person more internal depends on the culture which is being adopted, but a non-conformist character will usually produce an internal rather than an external person no matter which culture is being modelled.

Therefore, if acculturation has a strong effect, the prediction is:

Hypothesis 1: The greater the acculturation of an Hispanic to the Mainstream culture, the more the person will exhibit an internal locus of control.

Furthermore, we can also test the effect of non-conformist tendencies because of the specific nature of the subject pool, which are Navy recruits. Joining the Navy is probably inconsistent with traditional Hispanic culture and is indicative of non-conformist tendencies to Hispanic norms. Presumably this tendency is stronger among those Hispanics whose backgrounds remain fairly Hispanic. On the other hand, those Hispanics who, for instance, were born in the United States or have had a lot of interaction with the Mainstream culture do not have to possess strong non-conformist tendency in order to join the Navy. Following this line of argument, if non-conformity to one's own cultural norm is comparatively more powerful than acculturation in

determining internal belief, the Mainstream-acculturated Hispanics who join the Navy would be less internal than the less acculturated Hispanic recruits. Hence, these assumptions result in a hypothesis with an opposite pattern of results from Hypothesis 1, namely:

Hypothesis 2: The greater the acculturation of an Hispanic to the Mainstream culture, the less internal will be this person. The above reasoning is reflected in Table 1 which summarizes all assumptions and inferences for several possible outcomes. Inferences from the assumption that the Mainstream population is more external than the Hispanics, though not very likely to be true, is also included for the sake of completeness.

Insert Table 1 about here

One point has to be made explicit. All of the above reasoning is based on an assumption of either a positive or a negative relationship between the locus of control scores and the acculturation scores. If, however, this assumption is incorrect we will have to consider the following possible explanations:

(a) Neither learning about the Mainstream culture nor non-conformist tendencies affect a person's perceived locus of control.

(b) The two forces, acculturation and non-conformist tendencies, influence locus of control in opposite directions (which in this particular case is already obvious from our earlier discussion) and are equal in strength in determining a person's perceived locus of control.

In either case, we can only stay with a descriptive comparison of the two cultures on the control dimension. It is therefore useful to investigate the relationship between locus of control and acculturation.

Biculturalism

There is also a third hypothesis which is compatible with the two mentioned earlier. It is conceivable that a bicultural person, that is one who is comfortable with both cultures, should have a greater sense of control over the environment. Therefore if this assumption is correct, we should expect

Hypothesis 3: The bicultural group of Hispanics will be more internal than the rest of the Hispanics.

Method

Subjects

A total of 161 male Navy recruits participated in this study which was part of a larger project. Data were collected in three Navy recruit stations (Florida, California and Illinois). When a Spanish-surname recruit identified himself as "Hispanic", he was given a set of questionnaires to complete. At the same time, a non-Hispanic recruit was randomly selected and given the same questionnaires.

Instruments

Each recruit responded to a Personal Information Questionnaire that measured socio-economic status, degree of acculturation and biculturalism (Triandis, Hui, Lisansky & Marin, Note 3), as well as individual modernity. In addition, he responded to 24 items from Collins' (1974) modification of Rotter's IE Scale. The items were

chosen on the basis of their high loadings on the four Collins factors and judged meaningfulness to both Mainstream and Hispanic recruits.

The recruits also responded to nine F-positive and seven F-negative items, 12 items on religiosity (e.g., "Only by going back to religion can civilization hope to survive." "There is no survival of any kind after death"), four items tapping criticism of social institution (e.g., "'My country right or wrong' is a saying which expresses a fundamentally desirable attitude"), six items on moral liberalism (e.g., "People suffering from incurable diseases should have the choice of being put painlessly to death"), seven items on tolerance for ambiguity (e.g., "I would like to live in a foreign country for a while"), 14 items on religious locus of control (e.g., "A truly religious person is one who lets God be the master of his life," "It is impossible for me to believe that God plays an important role in my life"), nine items on supernaturalism (e.g., "Some people can contact the dead").

Some of the items of each scale were reversed in direction to counteract response bias. All were rated on a five-point scale ranging from "strongly agree" to "strongly disagree."

Analyses and Results

Multidimensional Scaling and Related Analyses

The 79 Mainstream subjects were randomly partitioned into two groups, hereafter referred to as A and B. The 82 Hispanic subjects were grouped according to their acculturation index into two groups. The more acculturated, and hence "less Hispanic", group is referred to as L; whereas the less acculturated, and hence "more Hispanic", group

is referred to as H. The size of the groups A, B, L, and H were, respectively, 39, 40, 41, and 41.

Scores on the items that had been reversed for counterbalancing purpose were reversed back so that a higher score indicates external control on all items. Matrices of the inter-correlations among the 24 items were constructed for the four groups. (Cases with an unanswered item were dropped from the computation of Pearson r involving that particular item.) These measures of the perceived similarities of items by the four groups of subjects, were analyzed by the computer program SINDSCAL (Pruzansky, 1975) for fitting the Carroll and Chang (1970) INDSCAL model.

A preliminary run with only five iterations was first performed for several solutions, varying in the number of dimensions (seven to two). The percentage of variance accounted for by each solution was used as a clue to determine the appropriate dimensional solution, which was then subjected to more iterations for convergence. A 5-dimensional solution was reasonable from the point of view of parsimony and precision. The solution accounted for 53.4% of the variance.

Insert Table 2 about here

Sixty-eight iterations were required to reach the criterion of convergence of .000010 and the percentage of variance accounted for was consequently raised to 56.0. The weights of the "subjects" and items (or stimuli) are listed in Table 2. The value of the former, w_{it}, reflects how much emphasis the subject i had on dimension t, where $1 \leq t$

$\leq r$ = 5. The square root of this value is the factor by which the subject i stretched the common stimulus space into the subject-specific space. (Remember that the term "subject" here refers to the aggregate subjects created by grouping the respondents according to their ethnic background.) Similarly, the stimulus weight, x_{jt}, refers to the coordinate of item j on dimension t in the common space.

To date no inferential test of subject weight differences has been developed. Thus we have to rely mainly on subjective judgments to discriminate dimensions that are equally emphasized by both ethnic groups from dimensions that are emphasized much more/less by one ethnic group than by the other. Bearing in mind the assumed equivalence between the two Mainstream samples, differences of weights between A and B on a dimension must be due to sampling fluctuation. This information can be used as a guide to determine cross-ethnic difference on that particular dimension. As it can be seen, Dimensions 1, 3, and 4 were emphasized equally by the two ethnic groups, though there is a slight tendency for the more Hispanic sample to be low on Dimension 1, and high on Dimension 4.

Dimensions 5 was "stretched" more by the Hispanics than by the Mainstream subjects. In other words, a representative Hispanic subject would be more inclined to differentiate along this dimension (i.e., it is salient for him), than would a representative Mainstream subject. For a concrete example, consider items 1 and 6 ("People's misfortunes result from the mistakes they make" and "In the long run people get the respect they deserve in this world") on Dimension 5. These were seen as more distant from each other by the two Hispanic groups (distances

being .284 (.161 + .123) x 1.691 ($\sqrt{2.860}$) = .480, and .284 x 1.428 ($\sqrt{2.038}$) = .406, for L and H respectively) than by the Mainstream groups (distances being .284 x $\sqrt{.727}$ = .242, and .284 x $\sqrt{1.386}$ = .334). Hence a group of items that may be located in the same part of the Euclidean space for one ethnic group may not be located so closely together for another. The necessary conditions for this to occur are that there is at least one dimension on which different subjects have different weights, and that the group of items are fairly scattered along that particular dimension.

Finally, Dimension 2 was emphasized equally by both the Mainstream subjects and the more acculturated Hispanics, while the less acculturated Hispanics did not stretch that dimension. This finding is probably an illustration of the effect of integration into Mainstream culture, through which one gradually internalizes the finer distinction of stimuli along a dimension used by the Mainstream.

In conclusion, this abridged version of Collins' IE Scale was imperfect in equivalence of construct operationalization, as shown by the difference in internal structure. However, this did not imply that the entire scale could not be used for a comparison of the two cultural groups, for there were parts of it which were shared.

Although initially the dimensional meanings were not readily apparent (Table 2b), it was not an obstacle to identify clusters of items that were perceived as similar by the subjects. Shepard (1972) explicated the advantages of applying cluster analysis to discover natural groupings in the spatial representation: "The discovery of natural clusters can greatly facilitate the interpretation of

representations in more than three dimensions, where the geometrical structure is not immediately evident to the eye"(p.40).

To this end a cluster analysis was employed to assist in the identification of groups of items. The "cluster analysis of cases" program (BMDP, 1977) groups a pair of items or clusters together to form a new cluster on the basis of the proximity among the centroids. Since the intercorrelations among the dimensions were small (from -.16 to .26), we can assume dimensional orthogonality, and compute the measure of proximity among the stimuli in the common space by

$$D = \left[\sum_{t=1}^{r} (w_{jt} - w_{kt})^2 \right]^{\frac{1}{2}}$$

where a smaller D denotes closer proximity, and r is the number of dimensions, and j and k are the pair of items the proximity between which we are interested in. The program, run on item coordinates on dimensions, extracted four readily interpretable clusters of items, which were very similar to Collins' (1974) factors.

Five items (four of them from Collins' "Difficult-Easy World") clustered together. The fifth item (no. 7, "As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control") had been found by Collins to be doubly loaded on his Factors 1 and 4. Another 5-item cluster was labelled "Just-Unjust World," for it consisted of items from Collins' Factor 2 (except for item 23). The two other clusters were named "Predictable-Unpredictable World" and "Politically Responsive-Unresponsive World," for they consisted of items from the original Collins factors. Two items (9, 15) from the original Difficult-Easy

World did not cluster with the rest of the items and therefore were discarded from further analysis. By this second analysis, we arrived at a fair approximation of meaningful groups of items.

But whether each of the four clusters are equally applicable to the Mainstream and the Hispanic population is a different question. A cluster of items which spans widely over an emic dimension (one that is "stretched" by one culture but not by the other) is more likely to be perceived as two separate clusters by the culture that emphasizes the emic dimension than by the other culture that does not. In other words, the same cluster of items does not measure the same construct in the two cultures. In the present case, Dimensions 2 and 5 are such emic dimensions. Consequently any cluster that consists of items that are widely dispersed along one of these two dimensions might not be shared by both cultures, and hence should be regarded as unsuitable for cross-cultural comparison.

Insert Fig. 1 about here

Figure 1 shows a plot of the items on a plane defined by the emic Dimensions 2 and 5. The clusters that represented the Difficult-Easy World and the Predictable-Unpredictable World did not span widely on either of the two dimension. On the other hand, both the Just-Unjust World and the Politically Responsive-Unresponsive World spreaded fairly widely. This indicates that the items of each of the latter two clusters were not very similar in meaning along these dimensions. A much stronger emphasis on these dimensions would magnify the

differences among the items. In this case a cluster of this kind might break up into smaller clusters and merge with some other items. In other words, the original cluster has different implications for groups that are different in their emphases on the dimensions along which the items vary in meaning. Hence from this scaling we conclude that the Just-Unjust World and the Politically Responsive-Unresponsive World lack cross-cultural validity.

Validation by Nomological Network

The multidimensional scaling method only demonstrates which instrument items are perceived as having the same meaning, and therefore can be used for tapping a construct, which is, quite circularly, defined by the items. In a sense, this method can do no more than to establish cross-cultural equivalence of constructs as operationalized (Hui, Note 4). Whether the construct that the cluster of items measures is cross-cultural is only assumed until the same set of relations between the construct in question and other constructs is found to exist in both cultures.

Insert Table 3 about here

To this end intercorrelations between the four Collins factors and a set of 12 psychological constructs were computed separately for the Hispanic and Mainstream subjects (Table 3). Among the seven pairs of correlation coefficients in which at least one of the pair was significant at the .05 level, only one pair of correlation coefficients were significantly different from one another for the Difficult-Easy

World. The other three subscales had one pair significantly different out of three or four pairs. The proportion of non-matching is lower for the Difficult-Easy World than for the other three subscales.

The Mainstream correlation coefficients for each subscale were then regressed on the Hispanic correlation coefficients of the same subscale. This gave us Table 4. It should be recalled that the Difficult-Easy World and the Predictable-Unpredictable World have been previously found to be more cross-culturally applicable than the other two, with respect to equivalence of operationalization. Moreover, if a construct is cross-culturally equivalent by nomological validation, the correlation coefficients from the two groups should match, and therefore we would expect a slope of 1.00.

Insert Table 4 about here

Table 4 shows that correlations for the first three factors were significant at the .05 level. Furthermore, the slope of the regression lines for the Difficult-Easy World and Just-Unjust World were much closer to 1.00 than the other two. This suggests that the Difficult-Easy World, the Just-Unjust World, and to a certain extent the Predictable-Unpredictable World factors possess a considerable degree of cross-cultural equivalence.

Inferences from the INDSCAL approach and the nomological validation approach do not agree perfectly. But this is not too surprising because the latter employed external criteria and embedded the constructs in question in a network of other constructs. The

former examined cross-cultural equivalence by comparing internal structures. At any rate, the Politically Responsive-Unresponsive World was consistently found to be cross-culturally non-equivalent, while the Difficult-Easy World was found to be acceptable as a cross-culturally valid construct. The two other subscales may or may not be cross-cultural equivalent. They passed one test but failed the other.

It is always desirable to have an objective, statistical test for cross-cultural conceptual/functional equivalence. Unfortunately, this has not been developed. Judgmentally, it was decided that the Politically Responsive-Unresponsive World should not be used in inter-group comparisons, and the Just-Unjust World and Predictable-Unpredictable World factors should be used with caution.

Intergroup Comparisons

To test the hypotheses of non-conformity versus acculturation have effects on locus of control, one-way ANOVA's were performed on the etic subscales. The Mainstream subjects, the more-acculturated Hispanics, and the less-acculturated Hispanics, were not significantly different from each other. Nor was a significant difference found for the emic subscale, Politically Responsive-Unresponsive World.

To test the third hypothesis, the Hispanic subjects were divided into two groups according to their scores on biculturalism. Simple t-tests were performed to compare the two groups on the locus of control subscales. Only comparison of the Difficult-Easy World showed a significant difference ($p<.05$) but in a direction opposite to the prediction of Hypothesis 3. Bicultural Hispanics perceived the world as more difficult than the less bicultural Hispanics did.

Factor Analysis

The more traditional method for examining internal structure congruence as a clue to cross-cultural equivalence was also used in this study to compare it with INDSCAL. The Mainstream and Hispanic intercorrelation matrices were factor analyzed, using the squared multiple correlations as the commonalities in the diagonals. Number of factors to be rotated was determined by the parallel analysis method (Humphreys & Montanelli, 1975). Following Collins, the extracted factors were subjected to a varimax rotation to achieve simple structure.

Insert Table 5 about here

Contrary to what Collins found, the general factor did not appear in the factor structure of the Mainstream subjects nor that of the Hispanics. Five factors were extracted from the Mainstream data and six from the Hispanic data (Table 5). Some of the factors were identifiable and some were not. For the Mainstream subjects, the first, second, and fourth factors can be labelled as "Predictability", "Political Responsivity", and "Influenceability" respectively. For the Hispanics, the first, second, third, and fifth factors can be labelled as "Political Responsivity I", "Predictability", "Political Responsivity II", and "Influenceability" respectively.

One of the ways to test whether a Mainstream factor is similar to a Hispanic factor is to compute the coefficient of congruence (Tucker, 1951; Korth & Tucker, 1975) of each Mainstream factor with every

Hispanic factor. As presented in Table 6, the Predictability factor of Mainstream subjects and Hispanics matched one another, and the Mainstream Political Responsivity factor was matched by two Hispanic factors.

Insert Table 6 about here

Although the congruence coefficients suggested matching in those factors the items constituting each of the matched factors were not the same for the two ethnic groups. For instance, setting the cutoff value of loading at .40, we can note that the Mainstream Predictability factor included items 2 and 19 which were absent from the Hispanic factor; and the same Hispanic factor had item 6 which was not included in the Mainstream factor. The Hispanic Political Responsivity I included items 3, 5, 7, 22, and 24, the Hispanic Political Responsivity II included items 4, 10, 11, and 14. The single Mainstream Political Responsivity factor had items 3, 4, 8, 11, 22, and 24. The third Mainstream factor and the fourth Hispanic factor, which matched according to Tucker's criterion, did not have even one item that loaded non-trivially on both.

Such discrepancies make <u>precise</u> identification of etic factors difficult. Scalar equivalence (Poortinga, 1971) is surely lacking if the mean Mainstream 6-item Predictability score is used to compare with the mean Hispanic 5-item score. On the other hand if the factor is reduced to the common items to attain similarity, the original meanings would be distorted. This basic dilemma is due to the separate factor

analyses of the two groups. Procrustes rotation, a procedure not recommended by Irvine and Carroll (1980) in cross-cultural research, also failed to achieve precise definition of the etic factors. For this reason, the result is not presented here.

Nevertheless, the factor analytic approach adds support to our earlier inference from INDSCAL that the Predictable-Unpredictable World is shared by both cultures. In addition, the very fact that the Political Responsive-Unresponsive World is divided into two independent factors among the Hispanics is also consistent with our earlier contention that Hispanics make finer distinctions among the political items, and therefore the Mainstream cluster of political items is not understood similarly by the Hispanic subjects.

Discussion

Factor Analysis versus Multidimensional Scaling

At this point the cost of the factor analytic approach should be fairly apparent. Factor structures from different subpopulations cannot be easily compared. Stability of the factor structure is weakened by a small sample size. The index of congruence is, in a sense, too sensitive to minor similarities between factors. On the other hand, INDSCAL forces the subpopulations and the items into a common Euclidean space, so that difference in construct salience can be detected. Subjective judgments are further required to determine whether a cluster of items is emic or etic.

The use of the INDSCAL approach is worthy of some more discussion. Theoretically, the input correlation matrices should contain judgments of similarity/differences for all pairs of items. A better design for

the present study consists of three steps. Firstly, collect similarity judgments of items from a group of Mainstream and Hispanic subjects. Secondly, analyze the proximity data by the INDSCAL and extract the shared clusters. Finally, using the refined instrument, collect intensity judgments (agreement-disagreement) from a new group of subjects. This procedure would enable us to look at the item clusters independently of subjects' positions on the rating scales. Limitations of subject availability precluded doing so. In spite of this, the item clusters generated from a less-than-perfect procedure still bear close resemblance to Collins' (1974) findings. However, in future studies using the INDSCAL method, every effort should be made to independently obtain a response-inferred set of item clusters.

There are two other justifications for preferring the multidimensional scaling to factor analysis in the present study. Sjöberg (1975) presented compelling arguments that the content models of similarity, on which many factor analytic techiques are based, suffer more theoretical and empirical limitations than does the distance model, which is the general assumption of most multidimensional scaling methods. For instance, problems in determination of number of factors and in rotation have rendered the content models relatively unattractive. This is one reason why the distance model, and multidimensional scaling, may be especially useful in this area of cross-cultural psychology.

The second justification concerns the purpose of this study. The research objective was to identify the cross-culturally equivalent subscales of control belief from the spatial representation of the

items provided by an average member of each cultural group. Although computing the proximity matrices by collapsing across individual subjects within group would eliminate information on individual differences, the "typical" perception of each group is derived and used for the investigation of the more pertinent question of cross-cultural difference in perception of the stimulus items. While factor analysis can only provide factors that represent the underlying relationships of a set of traits with respect to a sample, but not a spatial representation of the items (see MacCallum, 1974), on the contrary INDSCAL can serve the present purpose.

Examination of internal structure congruence (whether it is done by INDSCAL or by factor analysis) is not the only thing one can and should do to establish and improve cross-cultural equivalence. Validation by nomological network is also needed to establish conceptual and functional equivalence. Item response theory (Hulin, Komocar & Drasgow, Note 5) can also be used to improve item equivalence. Of course, one can never improve an instrument if that instrument cannot be modified. Introduction of new items inspired by anthropological understanding of the cultures to be compared will certainly enable INDSCAL to do a better job in a pilot study.

Acculturation versus Non-conformity

Absence of significant cross-cultural difference on all three etic subscales of control belief leaves us with the unsolved issue of acculturation versus non-conformity. As we do not know the "true" differences between the general populations of the Mainstream Americans and the Hispanics, no definite inference can be made.

Culture and acculturation might have no effect on locus of control. Zero-order correlations between acculturation and the subscale scores were not significant. Hence we may speculate that neither learning the Mainstream culture nor being non-conforming is related to control belief.

Of the three aspects of control belief, there was one (Just-Unjust World) on which acculturation has a significant non-monotonic effect. Hispanics lowest and highest in acculturation score were more internal on this subscale than those who were moderately acculturated. While this single piece of information does not contribute much to knowledge, it certainly suggests that acculturation may have different effects on locus of control depending on the level of an individual's acculturation. This aspect of acculturation should be probed in future research.

Dimensions of the Control Belief

The INDSCAL method with only 24 items out of Collins' (1974) original 46-item scale replicated the four Collins factors. A glance on the intercorrelations among the four subscales (Table 7) suggests, as in a number of other studies, that the factors constituting the control belief are not necessarily related to each other. Multidimensionality of the contruct is further shown in the failure to extract a common factor by factor analysis.

Insert Table 7 about here

Consistent with earlier findings (e.g., Garza, 1977), the Predictable-Unpredictable World factor (or Luck-fate factor, as labelled by Garza, 1977) was found to be cross-culturally equivalent for the ethnic groups in this study. Garza (1977) also reported that the "Politics" subscale was lacking in equivalence for Mainstream and Mexican subjects. This is echoed in the present data. Clearly the general idea of being able versus unable to control one's destiny is more universal than the idea of political control, which is a more specific domain, and is related to the type of government and political systems familiar to a cultural group.

But what is the generality of these findings? To answer this question other samples are needed. Luis Escovar graciously made available a data set that he had previously factor analyzed (Note 6). Respondents were three groups of college students: 164 Latinos from universities in Venezuela and Colombia, 98 Hispanics and 140 Anglos from an American university. The Latinos were assumed to be the least Mainstream-acculturated people whereas the Hispanics were assumed to be high in acculturation. The instrument used was the 23-item forced-choice Rotter scale.

Insert Table 8 about here

The correlation matrices of the three groups of respondents were subjected to INDSCAL analysis. The 4-dimensional solution which accounted for 54.6% of total variance is presented in Table 8. Intergroup differences in emphasis on dimensions are much smaller than

those observed with the Navy subjects. Following the same procedure as for the Navy data, the items which are alike in coordinates are clustered together. Four clusters emerged, which include the General/Luck (2, 6, 9, 11, 13, 15, 16, 18, 21, 25, 28, 29, in Rotter's scale), Political (3, 12, 17, 22), Academic (4, 5, 10, 23), and Friendship (7, 20, 26) clusters.

Insert Table 9 about here

Although the first two dimensions seem to be shared by the Anglo and Hispanic subjects but to a somewhat lesser degree by the Latino subjects, there is no cluster that spans widely along any of these dimensions. In other words, according to the reasoning in the previous section, each of the clusters of items can be used to tap a domain of control belief that is generalizable across the three cultural groups. This inference is further supported by the fact that the three groups have almost identical cluster structures when the individual stimulus spaces are examined separately (Table 9).

Cross-cultural equivalence of all these domains with data collected from college students suggests the hypothesis that one's way of looking at the world is determined more by education and related factors than by ethnic and cultural origins. A university is a similar institution across cultures, and selects similar kinds of students, and socializes them in a similar direction. This strong convergence, however, is not at work among the Navy recruits. They have just joint an institution and it will take some time for convergence to occur.

Equivalence might also be attributed to the instruments used in the Escovar data collection. The original English scale was given to the Anglo and Hispanic subjects. But for the Latino subjects, the researcher deliberately used a Spanish translation of the scale that was slightly modified to achieve meaningfulness of the items. Had the English, unmodified version been used, equivalence might have been reduced. Further research is necessary for clarification.

Conclusion

The purpose of this study was both methodological and substantive. Methodologically a strategy to determine and establish equivalence (especially equivalence in construct operationalization) for cross-cultural measurement was explored. Substantively, the Hispanic and Mainstream subjects were compared on control beliefs.

The INDSCAL is demonstrated to be a promising approach for examining the question of equivalence in construct operationalization (and to a lesser degree, conceptual/functional equivalence and item equivalence). One drawback of the present study is that independent groups of subjects were not used to judge the similarity among the items. Instead, intercorrelations among items according to the degree of agreement were analyzed by the INDSCAL. Despite this weakness, an unambiguous solution was extracted which in large part replicated Collins' (1974) original findings.

Substantively, the Political Responsive-Unresponsive World was found to be lacking in cross-cultural equivalence for the Mainstream and Hispanic Navy recruits, but not for the college students. For the Navy recruits, locus of control does not differ among the Mainstream

subjects and the Hispanics of either level of acculturation.

Notes

1. We thank Drs. Phipps Arabie, Lawrence Jones, Judith Lisansky, and Joseph McGrath for their critical comments on earlier versions of this report.

2. The items were those that remained after an item analysis. For an item to be used it had to discriminate the top from the bottom 27% of the distributions of subjects (both Mainstream and Hispanic) determined by responses to the total F+, F-, Tolerance for Ambiguity, etc. scales.

3. Fear of success was related to belief in a difficult and an unpredictable world for both cultures. Surprisingly it was negatively correlated with external belief in the Just-Unjust World subscale. In addition, authoritarianism and intolerance for ambiguity were related to belief in a difficult world. These are all interesting for further research.

Appendix

The INDSCAL model assumes that underlying a perceptual world of n stimuli there is a Euclidean space of t dimensions (where $t = 1,\ldots,r$) for subject i (where $i = 1,\ldots,m$). Although subjects are different in their perception and therefore their own individual space (just as some may have more and some less dimensions that define the space), all m individual spaces can be fitted into the same space by the weighting factor w_{it}. As Carroll and Chang (1970) argued,

> Two completely different spaces could be accomodated, for example, by assuming a "common" space combining all the dimensions of the two separate spaces (the direct sum, in technical terms). The dimensionality of the "super-space" would be the sum of the two dimensionalities. Then, by assuming that one group of subjects attaches zero weights or saliences to the dimensions of the first space, while a second group attaches zero weights to those of the second, this model becomes equivalent to the "two-separate spaces" model (pp.284-285).

The similarity judgments for subject i are assumed by the model to be a function of the perceived distance between pairs of stimuli,

$$s_{jk} = L\,(d_{jk})$$

where s_{jk} is the similarity of the jth and kth stimuli, and L is a linear function, and

$$d_{jk} = \left[\sum_{t=1}^{r} w_{it}\,(x_{jt} - x_{kt})^2\right]^{\frac{1}{2}}$$

where x_{jt} and x_{kt} are the recovered coordinates of stimuli j and k on dimension t of the weighted Euclidean space.

The weights (w_{it}) can also be represented in a separate Euclidean space of r dimensions in order to provide a spatial representation for the different subjects, or other sources of data. Concretely the weights gauge the magnitude of emphasis or salience placed on dimension t by subject i. A dimension t that is very salient (or meaningful) to subject i will have a relatively high w_{it}, and conceptually the subject may have a finer differentiation among stimuli along this heavily weighted dimension. To obtain the perceptual spaces for individuals, we can do it

> by multiplying the stimulus coordinates on each dimension by the square root of the subject weights for that dimension
>
> $$y_{ijt} = w_{it}^{\frac{1}{2}} x_{jt}$$
>
> where y_{ijt} is the stimulus j coordinate for individual i on dimension t (Schiffman, Reynolds, & Young, 1981, p.151).

This operation would result in differential shrinking and stretching of dimensions for each subject.

An important property of INDSCAL called "dimensional uniqueness" should be noted here. There is, however, no better way than to quote at length from Carroll and Wish (1974) for an explanation of this concept:

> This means that...the dimensions are uniquely determined, and cannot be rotated or otherwise transformed without changing the solution in an essential way. Psychologically this means that

> INDSCAL dimensions are assumed to correspond to "fundamental" physiological, perceptual, or conceptual processes whose strength, or "salience", may differ from individual to individual (whether because of genetic or environmental differences, or simply because of differing interpretations of instructions or the like). Mathematically, a rotation or other transformation of a coordinate system will change the family of permissible transformations of the group stimui space, and thus the family of possible individual metrics.... Statistically, a rotation...will generally deteriorate the fit of the data to the INDSCAL model (p.63).

Input to the computer consists of a set of $\underline{m}$ ($\underline{n}$ x $\underline{n}$) symmetric proximity matrices, where $\underline{m}$, as it is recalled, refers to the number of subjects. Two points are to be noted. Firstly, the term "subject" is a generic term which virtually means every possible source of data. It may denote a real person who provides the researcher with an $\underline{n}$ x $\underline{n}$ matrix of proximities, or an aggregate of persons from which the matrix is constructed (e.g., Wish, Deutsch, & Kaplan, 1976). Secondly, although the desired kind of information for the proximity matrices is pairwise judgment of distance, the program (SINDSCAL) used in this study accepts other proximity data such as Euclidean distances, covariances, and correlation coefficients.

The user also supplies the maximum and minimum numbers of dimensions desired, the maximum number of iterations allowed for convergence, and the starting configuration for iteration.

Through some complicated algorithm, the subject weights on each dimension ($\underline{w}_{it}$) and the stimulus coordinates in the common space are

estimated from the data. Hence on the output are a subject weights matrix, defining the w_{it}'s, and a stimulus coordinate matrix, consisting of the values of $\underline{x}$. In addition, the "HISTORY OF COMPUTATION shows the improvement in CORRELATIONS, the variance accounted for (VAF), the residual (LOSS), and the reason for termination"(Schiffman, Reynolds, & Young, 1981, p.163). We can also learn from the output the correlation among the extracted dimensions, and the correlations between computed scores and scalar products, which indicate how well are the subjects' individual data match with the group-derived solution.

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Table 1: Predicted Outcomes and Inferences about the Relative Strengths of Acculturation and Non-conformity in Determining Locus of Control

If the observed differences fall in this pattern:	If we make these assumptions about the general populations in relative degrees of externality:	
	M > H	H > M
	Then we may conclude that:	
M > H1 > H3	AC & NC	NC > AC
M = H1 > H3	AC & NC	NC > AC
H1 > H3 = M	AC & NC	NC > AC
H1 > H3 > M	AC has no effect NC is probable	NC > AC
M > H3 > H1	AC has no effect NC has no probable effect	AC has no effect NC has probable effect
M = H3 > H1	AC has no effect NC has no probable effect	NC & AC
H3 > H1 = M	No inference possible on given premises	AC > NC
H3 > H1 > M	No inference possible on given premises	AC > NC

Keys: M = Mainstream subjects
H1 = acculturated Hispanics
H3 = unacculturated Hispanics
NC = non-conformity
AC = acculturation
& = relative strengths not determinable

Table 2a: Weight Matrices of Aggregate "Subjects" on Five Dimensions Extracted by INDSCAL from Collins' Items

Aggregate "Subjects"	n	Dimensions				
		1	2	3	4	5
A (Mainstream 1)	39	4.060	2.490	1.147	2.212	.727
B (Mainstream 2)	40	1.438	2.962	2.906	.897	1.386
L (less Hispanic)	41	3.336	1.801	.969	1.117	2.860
H (more Hispanic)	41	.998	1.167	2.803	2.873	2.038

Table 2b: Weight Matrices of Items on Five Dimensions Extracted by INDSCAL from Collins' Items

	Dimensions				
	1	2	3	4	5
Difficult-Easy World					
2. Sometimes I feel that I don't have enough control over the direction my life is taking.	-.299	-.132	-.130	-.230	-.235
5. Most people don't realize the extent to which their lives are controlled by accidental happenings.	-.219	-.121	.189	.023	-.287
7. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.	-.078	.009	.074	-.014	-.345
12. Many times I feel that I have little influence over the things that happen to me.	-.268	-.137	.096	-.061	-.308
18. I have often found that what is going to happen will happen.	-.204	-.108	.308	-.008	-.137
Just-Unjust World					
1. People's misfortunes result from mistakes they make.	-.173	.183	-.150	.393	-.123
6. In the long run people get the respect they deserve in the world.	-.036	.016	-.299	.261	.161
13. What happens to me is my own doing.	-.012	-.062	-.235	.160	-.293
14. People are lonely because they do not try to be friendly.	.290	-.028	-.197	.020	-.145
23. Trusting to faith has never turned out as well for me as making a decision to take a definite course of action.	.165	-.055	-.211	.339	-.171

Table 2b, Page 2

	Dimensions				
	1	2	3	4	5
Predictable-Unpredictable World					
16. In my case, getting what I want has nothing to do with luck.	-.308	-.103	-.372	.021	.143
17. There is really no such thing as luck.	-.353	.119	-.301	-.070	.194
19. It is impossible for me to believe that luck plays an important role in my life.	-.257	-.072	-.205	-.291	.153
20. Many of the unhappy things in people's lives are partly due to bad luck.	-.429	.028	.004	-.118	.090
21. Becoming a success is a matter of hard work: luck has little or nothing to do with it.	-.273	-.026	-.294	.011	-.030
Politically Responsive-Unresponsive World					
3. It is difficult for people to have much control over the things politicians do in office.	-.068	.250	-.024	-.334	-.393
4. The average citizen can have an influence in government decision.	-.073	.341	-.205	-.214	-.079
8. With enough effort we can wipe out political corruption.	.021	.248	-.219	-.074	-.010
10. In the long run the people are responsible for bad government on a national as well as a local level.	.013	.305	-.089	-.132	-.077
11. One of the major reasons we have wars is that people do not take enough interest in politics.	-.014	.382	-.052	-.204	-.038
22. By taking an active part in political and social affairs the people can control world events.	.145	.409	-.101	.039	-.313
24. This world is run by the few people in power, and there is not much that the little guy can do about it.	-.029	.277	-.063	-.243	-.235

Table 2b, Page 3

	Dimensions				
	1	2	3	4	5
Unclustered					
9. Who gets to be the boss often depends on who was lucky enough to be in the right place first.	.140	.313	.179	.189	.200
15. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.	-.068	.206	.287	.397	.035

Table 3: Correlations Between INDSCAL-Matched-Collins Factors and 12 Psychological Constructs for Mainstream (n=79) and Hispanics (n=82)

	Difficult-easy world		Just-unjust world		Predictable-unpredictable world		Politically responsive-unresponsive world	
	M	H	M	H	M	H	M	H
SES	08	-12	02	-05	01	04	-13	-26*
Modernity	-09	-19*	-09	07	01	-02	-04	03
Religiosity	01	-12	00	-01	-03	14	06	-02
Work Value	-12	-08	-03	07	-09	≠-35*	00	-07
Fear of Success	21*	29*	-27*	-22*	22*	23*	-05	-10
F +	20*	27*	-27*	-23*	00	02	-06	-02
F -	-21*	-37*	08	-04	-09	-10	14	06
Criticism of social institutions	10	04	11	-02	09	13	05	05
Moral Liberalism	04	≠-22*	-15	-14	10	-03	25*	01
Tolerance for ambiguity	-15	-21*	-12	-21*	-15	11	-03	-03
Religious locus of control	02	10	02	-01	11	-13	-07	-04
Supernaturalism	01	18*	23*	≠-15	20*	23*	00	≠-28*

Decimals omitted, * = $p < .05$.

≠ indicates difference of correlation coefficients at $p < .05$.

Table 4: Similarity of Nomological Networks between Mainstream and Hispanic Subjects for Collins' Four Factors

Factor	Correlation coefficient	Slope
Difficult-Easy World	.81**	.64
Just-Unjust World	.56*	.71
Predictable-Unpredictable World	.50*	.35
Politically Responsive-Unresponsive World	.31	.25

* $p < .05$

** $p < .01$

Table 5: Rotated Factor Loadings of Collins' Items for Mainstream and Hispanic Subjects

	Mainstream					Hispanic					
Items[a]	I	II	III	IV	V	I	II	III	IV	V	VI
1	25	17	24	03	39	-12	08	09	22	10	-48
2	-47	-02	35	12	-25	15	-06	03	03	70	-18
3	06	-63	42	-02	-28	65	07	-23	19	17	-02
4	11	67	-08	04	21	-13	26	55	-10	-07	02
5	-20	08	08	57	12	32	03	17	06	13	15
6	02	01	-00	07	23	24	42	-03	53	11	05
7	-12	01	-03	-02	33	54	03	02	-09	14	11
8	24	41	31	17	-01	-09	04	06	11	02	56
9	28	-29	-47	07	-02	-11	22	11	-00	-51	-04
10	13	36	01	34	01	-20	-03	44	-15	11	-19
11	08	52	25	-05	-23	-00	00	60	-11	-15	06
12	-20	11	07	43	-43	15	01	-02	07	61	11
13	13	-04	16	-24	30	-08	-00	35	32	-12	-03
14	-19	-01	51	-01	04	06	-10	43	16	05	11
15	14	02	-47	01	03	-09	06	17	-16	07	18
16	57	-02	-02	00	23	22	69	-01	02	-17	14
17	60	29	-27	-04	-07	03	60	08	-17	18	-09
18	05	01	-02	52	-01	13	-00	29	23	25	32
19	65	-03	-27	02	-19	17	20	20	-34	-22	10
20	-48	-08	13	37	-10	13	-49	15	34	18	08
21	67	-01	04	-02	-05	-10	58	06	01	-20	02
22	-11	63	35	21	10	-51	-07	12	32	04	26
23	09	-06	29	20	12	-01	-23	-07	56	03	-01
24	10	-53	25	10	20	50	-15	-18	06	14	-22

Decimals omitted

a. Table 2 has the actual wording of the items

Table 6: Congruence Coefficients Between Mainstream and Hispanic Factors

Hispanic Factors	Mainstream Factors				
	1	2	3	4	5
1	-05	-58*	18	17	-04
2	78*	17	-31	-15	16
3	15	63*	09	27	11
4	-23	-08	56*	34	30
5	-49	03	41	49	-27
6	02	29	03	34	-15

* $p < .05$

Decimals omitted

Table 7: Intercorrelations Among the Four Control Clusters for Mainstream and Hispanic Subjects

		Difficult-easy world	Just-unjust world	edictable-predictable world
Just-unjust world	Anglo	-04		
	Hispanic	-12		
Predictable-unpredictable world	Anglo	36*	-01	
	Hispanic	12	-09	
Politically responsive-unresponsive world	Anglo	-10	03	11
	Hispanic	17	03	08

* $p<.001$

Decimals omitted

Table 8a: Weight Matrices of Aggregate "Subjects" on Four Dimensions Extracted by INDSCAL from Rotter's Scale

Aggregate "Subjects"	n	Dimensions			
Anglos	140	2.709	2.272	1.238	1.508
Hispanics	98	2.891	2.018	2.000	1.327
Latinos	164	1.897	1.207	1.691	1.807

Table 8b: Weight Matrices of Items on Four Dimensions Extracted by INDSCAL from Rotter's Scale

	Dimensions			
	1	2	3	4
2. Many of the unhappy things in people's lives are partly due to bad luck. People's misfortunes result from the mistakes they make.	.136	-.143	.123	.067
3. One of the major reasons why we have wars is because people don't take enough interest in politics.	.324	-.093	-.044	-.309
4. In the long run people get the respect they deserve in this world. Unfortunately an individual's worth often passes unrecognized no matter how hard he tries.	.231	-.140	-.173	-.006
5. The idea that teachers are unfair to students is nonsense. Most students don't realize the extent to which their grades are influenced by accidental happenings.	.144	-.302	-.125	.259
6. Without the right breaks one cannot be an effective leader. Capable people who fail to become leaders have not taken advantage of their opportunities.	.096	-.073	.334	-.004
7. No matter how hard you try some people just don't like you. People who can't get others to like them don't understand how to get along with others.	-.015	-.369	.037	-.295
9. I have often found that what is going to happen will happen. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.	.077	-.142	.336	.101
10. In the case of the well prepared student there is rarely if ever such a thing as an unfair test. Many times exam questions tend to be so unrelated to course work that studying is really useless.	.226	-.196	-.325	.258
11. Becoming a success is a matter of hard work, luck has little or nothing to do with it. Getting a good job depends mainly on being in the right place at the right time.	.205	-.238	.297	.076

Table 8b, Page 2

	Dimensions			
	1	2	3	4
12. The average citizen can have an influence in government decisions. / This world is run by the few people in power, and there is not much the little guy can do about it.	.418	.058	.012	.048
13. When I make plans, I am almost certain that I can make them work. / It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.	.147	-.266	.161	.264
15. In my case getting what I want has little or nothing to do with luck. / Many times we might just as well decide what to do by flipping a coin.	.138	-.183	.160	.215
16. Who gets to be the boss often depends on who was lucky enough to be in the right place first. / Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.	.128	-.129	.235	.174
17. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control. / By taking an active part in political and social affairs the people can control world events.	.400	.073	.211	-.177
18. Most people can't realize the extent to which their lives are controlled by accidental happenings. / There really is no such thing as "luck".	.222	-.232	.251	.165
20. It is hard to know whether or not a person really likes you. / How many friends you have depends upon how nice a person you are.	-.017	-.293	.047	-.120
21. In the long run the bad things that happen are balanced by the good ones. / Most misfortunes are the results of lack of ability, ignorance, laziness, or all three.	.028	-.173	.236	-.064

Table 8b, Page 3

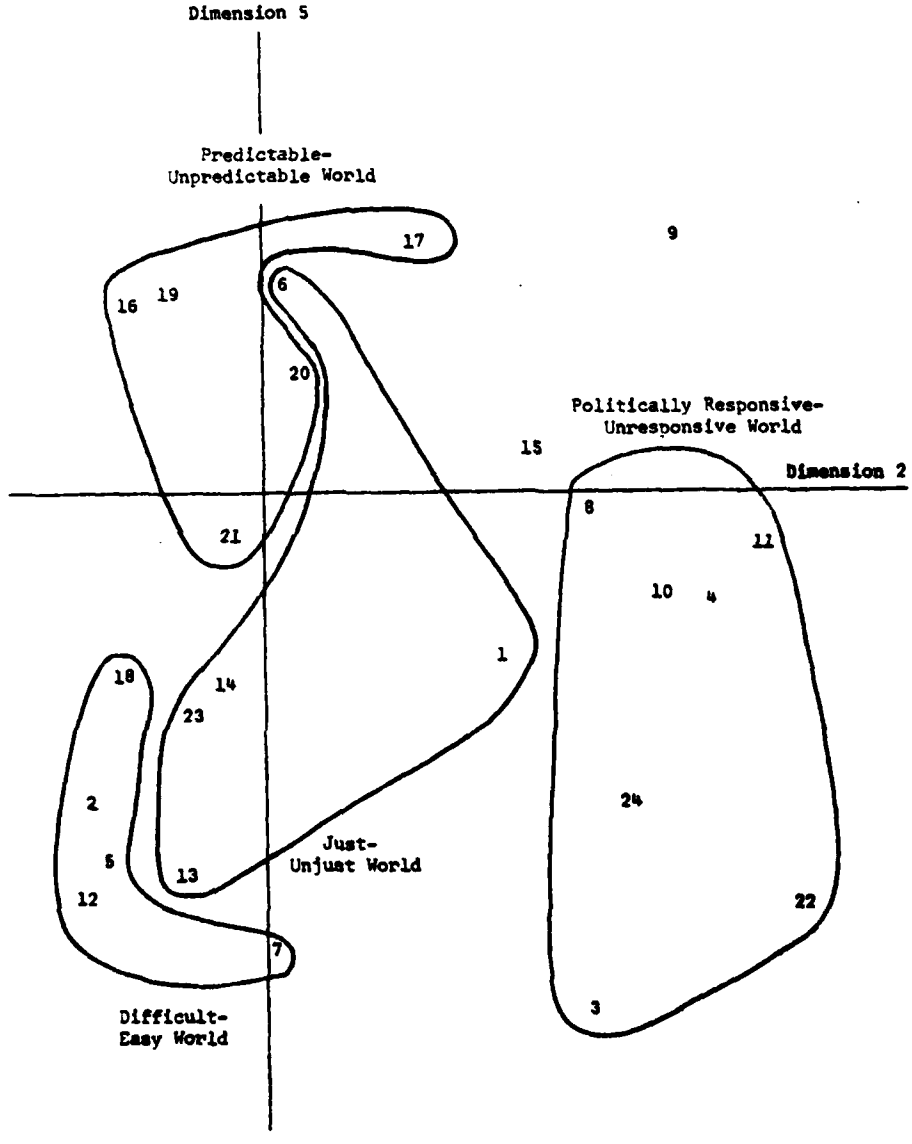
	Dimensions			
	1	2	3	4
22. With enough effort we can wipe out political corruption. It is difficult for people to have much control over the things politicians do in office.	.374	.005	.184	-.138
23. Sometimes I can't understand how teachers arrive at the grades they give. There is a direct connection between how hard I study and the grades I get.	.125	-.330	-.148	.232
25. Many times I feel I have little influence over the things that happen to me. It is impossible for me to believe that chance or luck plays an important role in my life.	.195	-.218	.298	.288
26. People are lonely because they don't try to be friendly. There's not much use in trying too hard to please people, if they like you, they like you.	.028	-.278	.119	-.414
28. What happens to me is my own doing. Sometimes I feel that I don't have enough control over the directions my life is taking.	.171	-.190	.116	.328
29. Most of the time I can't understand why politicians behave the way they do. In the long run the people are responsible for bad government on a national as well as on a local level.	.168	.185	.272	.060

Items 1, 8, 14, 19, 24, 27 are fillers and therefore excluded from analysis.

Table 9: Clusters of Three Cultural Groups as Extracted by Cluster Analyses on Individual Space

	Clusters			
	General/Luck	Political	Academic	Friendship
ANGLO	2, 6, 9, 11, 13, 15, 16, 18, 21, 25, 28	3, 12, 17, 22, 29	4, 5, 10, 23	7, 20, 26
LATINO	2, 6, 9, 11, 13, 15, 16, 18, 21, 25, 28, 29	3, 12, 17, 22	4, 5, 10, 23	7, 20, 26
HISPANIC	2, 6, 9, 11, 13, 15, 16, 18, 21, 25, 28, 29	3, 12, 17, 22	4, 5, 10, 23	7, 20, 26

Figure 1: INDSCAL Stimulus Space (Common) of Dimension 5 vs Dimension 2



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Ohio State University
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Cambridge, MA 02139

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Manpower Research & Advisory Services
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University of Oregon
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Dr. Siegfried Streufert
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Pennsylvania State University
Milton S. Hershey Medical Center
Hershey, PA 17033

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University of Oregon, West Campus
Eugene, OR 97403

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Department of Psychological Sciences
Purdue University
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Department of Psychology
Stanford University
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Assistant of DASN(EO)
Pentagon, Room 5D824
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