AN APPLICATION OF CONSTRUCT VALIDATION

by

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CHAPTER I

INTRODUCTION AND PROBLEM STATEMENT

Introduction

This thesis will examine the application of the rules of construct validation to a sociological concept, status consistency-inconsistency. The results should demonstrate the heuristic value of using construct validation and aid in the reduction of ambiguity surrounding this concept.

Delineation of a Sociological Problem

In deciding what constitutes an appropriate question for sociological investigation, this author was guided by Merton's two "areas of consideration"; those within the discipline and those delineated by the social millieux.[1]

Merton has further explicated problems for scientific examination within the discipline as those which create "conceptual obstacles to inquiry"[2], of which he states:

> 'Periodically, investigation of a range of problems is found to have gone about as far as it can with the use of existing concepts. Useful for a time, the concepts now prove to be insufficiently differentiated, thus typically introducing the problem of devising appropriate classifications.'[3]

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[1] Robert K. Merton, L. Broom, and L. Cottrell (eds.), *Sociology Today: Problems and Prospects*. (New York: Harper and Row, 1959), pp. xxix-xxxiii.

[2] Merton, Broom, Cottrell, *op.cit.*, pp. xxxi.

[3] Ibid.

The key phrase in the foregoing is the statement concerning "insufficiently indifferentiated" concepts. Concepts may become so ambiguous, i.e., have several meanings or interpretations, that their utilization is impractical.

Lazarsfeld further comments on the difficulties created by ambiguity of terms and supports this as an important area of concern for sociologists. He spoke specifically of "clarification of terms"[4], as follows:

> 'Clarifying terms is probably the oldest duty of the methodologist and, unfortunately, one which never ends. Zetterberg has noted how many sociological terms fuse description, evaluation, and prescription....Lazarsfeld has shown how many typologies are defective because the authors fail to specify the dimension, and the combinations thereof, from which the typologies implicitly derive.'[5]

Hempel has also commented on the process of "explication" employed by scientists regarding the word terms or concepts they use:

> 'Explication aims at reducing the limitations, ambiguities, and inconsistencies of ordinary usage of language by propounding a reinterpretation intended to enhance the clarity and precision of their meanings as well as their ability to function in the processes and theories with explanatory and predictive force.'[6]

Hempel indicates that explication attempts to reduce the ambiguities of "ordinary usage of language" through definitional preciseness, or explicitness, and by enhancing clarity by establishing the "precision of meanings", i.e., making stronger the ties between the word terms or concepts and their "real world" indicators or referrents.

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[4]Merton, Broom, Cottrell, op.cit., pp. 40-41.

[5]Ibid.

[6]Carl Hempel, Fundamentals of Concept Formation In Empirical Science. (Chicago: University of Chicago Press, 1952), p. 12.

The question logically derived from the above discussion is, why is ambiguity of terms or concepts so important, in terms of consequences, implications, or results?

Science is a cumulative and additive process. One of the requisites for this process is clear communication. Therefore, ambiguity of terms becomes a major obstacle to science. Specifically ambiguity makes difficult the following types of scientific endeavor:

(1) comparing cross-national or cross-cultural research work;

(2) communicating clearly with others, either in the professional community or with laymen, concerning the concepts themselves or empirical findings; and,

(3) conducting meaningful replications.

As the above cited scholars have indicated, reduction of ambiguity, both definitionally and empirically, has been a paramount concern to scientists, addressed by them through the process of validation.

Validity is a statement expressed about a word term or concept's relative ability to reflect either or both of the following attributes of a word term:

(1) an explicit or precise definition;

(2) an expression denoting the relative effectiveness of the concept or word term to consistently, over repeated efforts, reflect the same dimensions of a designated "real world" referent, indicator, or measure.

From this discussion, we understand the process of validation to be a series of systematic steps, procedures employed to assess the foregoing two attributes of a word term concept.

Our next question is which word term/concept shall we select to apply the process of validation?

The Problematic Concept

Since 1953, a concept was introduced into sociological literature via social stratification labelled, "status inconsistency", and its logical opposite, "status consistency". Over eighty articles have used or discussed this concept as an independent variable. It was also the subject of a number of master's theses and doctoral dissertations. The use of this concept and the debates concerning it have not waned, evidenced by its reappearance in sociological journals at least yearly.

Stehr[7] succinctly summarizes the conclusions of some other researchers regarding this concept's validity as follows:

> 'We have argued that the operational definition of status consistency presently in use, although highly reliable, is not valid. Thus, it cannot fulfill the function of testing the underlying theoretical model.'[8]

Gerhard Lenski popularized the use of this concept in 1954.[9] Lenski has devised two measuring systems for status consistency. Both are described in Appendix B. It will be the second method, the one used by persons adopting his concept and technique, that shall be examined in this paper. Another method, also widely used, was devised by Elton Jackson in his article in 1962.[10] These two methods, Lenski's and Jackson's, shall be employed in the validation steps applied to this concept. This particu-

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[7]Nico Stehr, "Status Consistency: The Theoretical Concept and Its Empirical Referrent." _Pacific Sociological Review, 11_ (Number 2), pp. 95-99.

[8]Stehr, _op.cit._, p. 98.

[9]Gerhard Lenski, "Status Crystallization: A Non-Vertical Dimension of Social Status." _ASR_ 19 (1954), pp. 405-444.

[10]Elton Jackson, "Status Consistency and Symptoms of Stress." _ASR_ 27 (1962), pp. 469-481.

lar concept may be said to be problematical regarding its "explication"[11] or "validity"[12], in several ways:

(1) <u>multiple terms</u>: we can identify the same attributes of the concept, "status consistency", i.e., the identification of an individual's overall status ranking by assessing his rank on each of several status hierarchies resulting in some aggregate status value or classification, by the following word terms from different authors in the literature; "status crystallization"[13], "status congruency"[14], "status consistency"[15], and "status equalization"[16].

(2) <u>different referrents</u>: different authors focus on different aspects of the same theoretical measurement, i.e., some focus on measures of agreement between status ranks and others focus on the differences between the status ranks of an individual.

'Status consistency. . .refers generally to the extent to which an individual's different statuses in various hierarchies "agree".'[17]

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[11] Where explication is the generic term referred to by Hempel on page 2 of this thesis and

[12] validity the specific term for one of its processes as referred to on page 2 of this thesis.

[13] Lenski, <u>op.cit</u>., p. 405.

[14] Arlene C. Brandon, "Status Congruence and Expectations." <u>Sociometry</u>, 28 (1965), pp. 272-288.

[15] Elton Jackson, <u>op.cit</u>., p. 469.

[16] Salomon Rettig, Leo Despres, and Benjamin Pasamanick, "Status Stratification and Status Equalization", <u>The Journal of Social Psychology</u>, 52 (1960), pp. 109-117.

[17] Milton Bloombaum, "The Mobility Dimension in Status Consistency", <u>Sociology and Social Research</u>, 48 (Number 4, 1964), pp. 340-347.

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'We would like to stress here that status inconsistency does
not refer to a lack of agreement concerning a given kind of
rank. It refers rather to inconsistencies among different
kinds of ranks on each of which there is agreement.'[18]

(3) <u>predictive value</u>: this question revolves around a discussion

of whether the predictive value of a composite score, reflecting

either an agreement or discrepancy sum score measurement of an

individual's status rankings, is more predictive than a comparison

between two status ranks for the same individual.

Some tentative solutions have been proposed to these stated problem

areas. We will accept the following conclusions for the purposes of this

thesis, so that we may focus on the more fundamental question of the validity

of the problem concept, status consistency.

Regarding "multiple terms", we concur with Broom[19] that measurement of

an individual's status ranks aggregated into a composite score of classifi-

cation type shall be referred to as "status consistency". Since we are using

the Gerhard Lenski operationalization of status consistency, the problem of

"different referrents" is resolved in that Lenski *used measures of agreement*

to arrive at an individual's degree of consistency among ranks. The "pre-

dictive value" question is unanswered at this point. Hyman discusses the

problem of general and specific status measurements as follows:

'General rank inconsistency is simply the <u>total degree</u> of
dispersion among ranks on <u>a number</u> of social hierarchies,
without regard to the composition of this dispersion in
terms of the amount of (or direction of) discrepancy between

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[18]James C. Kimberly, "Status Inconsistency: A Reformulation of a Theoretical
Problem", <u>Human Relations</u>, 20 (May, 1967), pp. 171-179.

[19]Merton, Broom, Cottrell, <u>op.cit.</u>, p. 430.

> ranks on hierarchies A and B, A and C, B and C, etc. . . . .
> Specific rank inconsistency, on the other hand, consists of
> the degree of discrepancy between the ranks an individual
> holds on two specific social hierarchies.'[20]

However, remembering that it is the Lenski operationalization we are dealing

with, this paper is concerned only with <u>general</u> rank consistency measures,

since Lenski used composite sum scores across all rank dimensions measured.

Our next question is:

"What form of validation procedure is appropriate for this problem-

atic concept?"

Selection of a Validation Technique

Validity is defined as an unending process wherein the "matter of

degree (by which) a measuring instrument. . . .does what is intended to

do"[21] is established. "Strictly speaking one validates not a measuring

instrument, but rather some use to which the instrument is put."[22] Validity,

as with other measurement concepts, has been explicated into sub-parts,

predictive, content, construct, and face. Predictive validity is used when

the purpose of the instrument is to measure, i.e., estimate, some important

form of behavior, referred to as the criterion. This validity is determined

by the degree of correspondence between the two measures, the predictor

(independent) and the predicted (criterion). Content validity is concerned

with how well a domain of content, items for test construction or measures

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[20]M. D. Hyman, "Some Attitudinal and Behavioral Consequences of Certain Forms of Rank Inconsistency." Unpublished Ph.D. dissertation, Department of Sociology, Columbia University, (New York: 1964).

[21]Jum Nunnally, Psychometric Theory. (New York: McGraw-Hill Company, 1967), p. 75.

[22]Nunnally, <u>op.cit.</u>, p. 76.

of a variable, have been adequately sampled and are represented in the
research instrument. Another aspect of content validity is, or can be,
consensual judgment as to the rigor and application of the research. Face
validity is ignored in this paper. It relies solely upon subjective and
consensual agreement among some referent groups as to the appearance of
items. No statistical or methodological techniques exist to confirm or
deny it.

Construct validity is:

'Most measures . . .represent efforts to measure relatively
abstract variables, ones that are thought to be evidenced
in a variety of forms of behavior and not perfectly so in
any one of them. To the extent that a variable is abstract
rather than concrete, we speak of it as being a construct.
Such a variable is literally a construct in that it is
something that the scientist puts together from his own
imagination, something that does not exist as an isolated,
observable dimension of behavior . . .(a) construct represents
a hypothesis (usually half-formed) that a variety of
behaviors will correlate with one another in studies of
individual differences and/or will be similarly affected
by experimental treatments.'[23]

From the above, it appears that the concept, status consistency-
inconsistency, would be best described as a construct for the following
reasons:

(1) the concept is not directly observable as a single dimension
of behavior or attributes;

(2) the concept requires measures of several dimensions of behavior
or attributes to be combined or to reflect a single dimension;

(3) the concept does not or cannot exist until a comparison between
the measures of several dimensions of behavior or attributes
are made, it is the results of these comparisons reflected
as a single score or value that is referred to as the concept
measure;

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[23]Nunnally, op.cit., p. 86.

(4) composite scores, when each component subscore or variable
measure represents only part of the total score, are, by
definition, constructs.

Therefore, the concept of status consistency-inconsistency will be
regarded as a construct. The rules of validation for constructs will be
appropriate.

Some Other Useful Validation Techniques

The approach of Campbell and Fiske, cited below, in multi-trait multi-
method assessment validity seem particularly applicable to this study;

> 'We believe that before one can test the relationships between a
> specific trait and other traits, one must have some confidence in
> one's measures of that trait. Such confidence can be supported
> by evidence of convergent and discriminant validation. Stated in
> different words, any conceptual formulation of trait will usually
> include implicitly the proposition that this trait is a response
> tendency which can be observed under more than one experimental
> condition and that this trait can be meaningfully differentiated
> from other traits. The testing of these. . .propositions must
> be prior to the testing of other propositions to prevent the
> acceptance of erroneous conclusions.'[24]

They further state;

> 'Both reliability and validity concepts require that agreement
> between measures be demonstrated. A common denominator which most
> validity concepts share in contra-distinction to reliability is
> that this agreement represent the convergence of independent
> approaches. . .For construct validity it has been stated thus:
> "Numerous successful predictions dealing with phenotypically diverse
> 'criteria' give greater weight to the claim of construct validity
> than do. . .predictions involving very similar behavior". . .
> Reliability is the agreement between two efforts to measure the
> same trait through maximally similar methods. Validity is represented
> in the agreement between two attempts to measure the same trait
> through maximally different methods.'[25]

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[24]Donald T. Campbell and Donald W. Fiske, "Convergent and Discriminant
Validation by the Multi-trait Multi-method Matrix." _Psychological
Bulletin_, 56 (No. 2, March, 1959), p. 100.

[25]Campbell and Fiske, _op.cit._, p. 83.

They continue:

'Validation is (therefore) typically convergent, a confirmation by independent measurement procedures. Independence of methods is a common denominator among the major types of validity (excepting content validity) insofar as they are to be distinguished from reliability. . .For the justification of novel trait measures, for the validation of test interpretation, or for the establishment of construct validity, discriminant validation as well as convergent validation is required. Tests can be invalidated by too high correlations with other tests from which they were intended to differ.'[26]

Convergent validity refers to the ability of two (or more) independent measures of a given phenomenon to identify the same phenomenon. If we have evidence that measure A_1 is highly correlated with our concept, A, and that measure A_2 is also highly correlated with our concept; and, if both measures are independent, i.e, we have evidence that neither is highly intercorrelated or linear functions of each other, then we have some evidence that the construct, which is our concept in measurement terminology, is in fact a valid concept. Further evidence is required concerning the discriminatory ability of measures A_1 and A_2. If A_1 and A_2 are highly intercorrelated with each other or with concept B, or some other concept, then we have evidence that they are not independent measures, but could be linear combinations of some common measure which underlies both of them.

Therefore, this *multi-method* procedure, the comparison between methods of measurement, is an additional check on the validity of a construct type of concept.

All of the validation measures described approach the assessment of the concept's validation attributes of definitional preciseness/explicitness and the establishment of the uniqueness of the concept's measure to a real

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[26]Campbell and Fiske, op.cit., p. 81.

world phenomenon. The latter is approached through applying some internal tests described in the "Rules of Validation" section of this thesis to the construct as well as the external tests described by the Campbell-Fiske multi-method procedure elaborated above.

CHAPTER II

METHODOLOGY: RULES OF VALIDATION, HYPOTHESES, AND DATA

Introduction

This chapter shall: (1) elaborate the rules of validation for the
selected construct, status consistency; (2) hypotheses will be derived from
the assumptions of the Campbell-Fiske multi-method validation techniques
for comparing the Lenski and Jackson measurement methods; and, (3) the
common data utilized for all assessments will be examined.

Rules of Validation

The following discussion of rules of validation is applicable for
constructs and construct validation.

Rule 1: 'Specifying the domain of observables.'[1]

Rule one refers to "construct explication"[2]. That is, the "process
of making an abstract word explicit in terms of observable variables."[3]
"Outlining the domain of variables for a construct. . .(or) Outlining a
construct consists essentially of stating what one means by the use of
particular words. . .the 'outline' usually consists of only a definition
in which the word denoting the construct is related to words at a lower

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[1] Jum Nunnally, Psychometric Theory. (New York: McGraw-Hill Company,
1967), p. 75.

[2] Nunnally, op.cit., p. 76.

[3] Nunnally, op.cit., p. 86.

level of abstraction.'[4] "The outline essentially constitutes a theory

regarding how variables will relate to one another;. . .the major importance

of (rule) 1 (outlining the domain) is that it tells you what to do in

(rule) 2 (investigating relations among different proposed measures of a

construct).'[5] The application of rule one does not form a substantive

portion of this thesis problem. The origin and logical explication of our

construct, status consistency-inconsistency, and the rules of verbal logic

are contained in Appendix A, and will not be dealt with further in the

body of this paper.

> Rule 2: 'Determining to what extent all, or some of those
> observables correlate with each other or are affected alike
> by experimental[6] treatments.'[7]

Because of the interpretive significance of intercorrelations among

the variables (scores) of a composite score, our construct, we must provide

a careful examination of the values obtained. If our dependent variable,

political liberalism, can be expressed as a linearally additive function of

our independent variables, race-ethnicity, occupation, education, and income,

then we have a homogeneous construct, i.e., our variables (of the construct)

are interrelated and (relatively) highly intercorrelated which makes them

expressable in linearally additive algebraic equations. This becomes

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[4]Nunnally, op.cit., p. 89.

[5]Nunnally, op.cit., p. 89.

[6]The reader should note that since we are using the Lenski measurement
method, his design was sample survey, not experimental. Therefore,
allusions to experimental applications should be disregarded. The appli-
cation to non-experimental designs does not alter the validation procedures
or results. For a discussion of Lenski's method, see Appendix B of this
thesis.

[7]Nunnally, op.cit., p. 87, 89.

important when you want to select the appropriate statistical test of sig-
nificance, because only linearally additive constructs may utilize the
commonly used regression and factor analysis techniques. Use of these
techniques is considered desireable because of their relatively greater
"power" they bring to the researcher's evidence of the relationship among
variables. Since prediction, if not causal ordering, is the desired result
of scientific endeavor, the stronger or more powerful the statement that
can be made on the evidence of the data from the statistical tests, the
more highly valued (or so it seems) is the knowledge derived therefrom.
Ergo, the discussion which follows concerning the correlations among the
constituent variables of the composite score/construct.

'In studies of individual differences, the first step is to obtain
scores for a sample of individuals on some of the measures; next, each
measure is correlated with all other measures. An analysis of the resulting
correlations provides evidence about the extent to which all the measures
tend to measure the same thing.'[8] We are, in effect, examining the unidimen-
sionality of this construct, the ability of its measures to "hang together"
or intercorrelate with each other, but not with other measures of other
constructs.

The variables employed will be: income, occupation, education, and
race-ethnicity. These variables are used since Lenski used all four as did
Jackson, except the variable income. The variables we use to form the
correlations are: the raw or observed values of the variables, education,
occupation, income, and race-ethnicity; the cumulative percentile values

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[8]Nunnally, op.cit., p. 89.

for each of these variables, race-ethnicity, income, occupation, and edu-
cation (the Lenski method); the crystallization score, which is the general
or composite score of status consistency computed for each individual in
the Lenski method; the sum or composite score of the dependent variable,
the construct, political liberalism. Correlation between these variables
will demonstrate the degree of their internal consistency.

How shall we judge the correlation values of our matrix? Obviously
there is some degree of arbitrariness about the selection of high or low
correlation values. Schuessler[9] indicates that a correlation value of .90
or greater means that the two measures are measuring the same thing,
referred to as the communality of measures.[10] Hence, this high value for
a correlation may represent too much correlation for our purposes. If two
of our measures attain .90, then essentially one is just, in relative terms,
as efficient a measure of the trait as the other. There would be no real
need, statistically speaking, of retaining both measures because one is just
as good an indicator as the other. However, the decision to keep or reject
a measure or measures with such correlations rests with the theoretical

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[9]John H. Mueller, Karl F. Schuessler, Statistical Reasoning in Sociology.
(Boston: Houghton Mifflin Company, 1961), p. 335.

'What Is A High Correlation? A correlation is judged "high" or "low"
according to the same standards as any other phenomenon is so judged:
either in absolute terms, or relative terms. In absolute terms, a
correlation is high or low as it approaches its possible numerical
limits. Hence, .9 is high, and .2 is low. However, in terms of the
norms of human expectation and demand, absolute terms are not very
meaningful. A correlation of .7 would be considered very low for
test-retest problems, where the reliability of the test is in question,
but very high for the correlation between IQ and grades. Familiarity
with the scientific norms prevailing in given situations offers the
only guide for useful judgments.'

[10]Karl F. Schuessler, "Causality Versus Communality." et al, 2 (Summer,
1969), pp. 21-23.

definition of this construct. If the variable is required as a substantive part of the construct according to our theory, then it should be retained regardless of what its correlation value may be, high or low.

In terms of the remaining correlations, we shall examine the inter-correlations among the subset of raw or observed values, the intercorrelations among the subset of coded or transformed variables, those coded using the cumulative percentiles; and each of these subsets with the Lenski general status rank score, his crystallization score; and the dependent variable, the composite score of political liberalism. In relative terms, we would expect our intercorrelations among the subset items to have higher intercorrelations values than any single item of the subset with other variables, such as an occupation score to the crystallization scores.

We would also have some evidence of discriminant and convergent validity. Discriminant validity in that a given subset of measures intercorrelates higher among its variables than it does with any other 'set of variables, which means the particular set of measures does provide discrimination. . .they identify one factor, or trait, but not another. Evidence of convergence would be partially reflected if the coding of the raw values by cumulative percentiles does not appreciably alter the intercorrelations among this subset. Intercorrelation among the coded cumulative percentile subset of values should be as high as for the raw observed values. Any significant change or difference would reflect the <u>effect of using cumulative percentiles</u> to code the variable measure as opposed to raw or observed values.

Rule 3: 'Determining whether or not one, some, or all measures of such variables act as though they measure the construct.'[11]

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[11]Nunnally, <u>op.cit</u>., p. 87, 90, 92.

To ascertain this, we plot each of the measures of our variables, the same as included in the correlation matrix; income, occupation, race-ethnicity, education; their coded counterparts in cumulative percentile form; the general rank status scores-crystallization scores with the dependent variable composite sum scores to examine the differentiation each is able to make among the dependent variable scores. If our independent variables demonstrate a linearally additive relationship to our dependent variable, then all of the variables which comprise each of the subsets, like the raw observed values for example, should exhibit the same type of differentiation among the dependent variable, i.e., if one variable graphs high, all of the rest should also, such as in the example below of <u>mono</u>-<u>tonic</u> or homogeneous relationships.

Independent
Variables
    A=*
    B=x

Dependent Variable
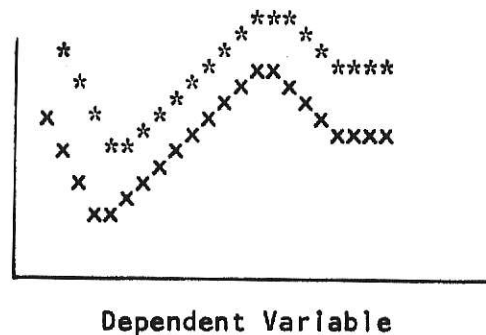
Therefore, as variable A in the example above varies in its ability to differentiate among the dependent variable values, so does variable B, in the same way graphically, a homogeneous construct. If this is not true, then we have what is referred to as a heterogeneous construct, which is just to say that our variables are not highly interrelated and that they do not discriminate among the dependent variable in the same way. Therefore, we

cannot treat the component variables of our construct as having a linear
and additive effect. This means that the construct is not unidimensional,
a goal sought by most construct builders. Its lack of unidimensionality
means that different statistical techniques must be used, in other words
statistical techniques based on linear and additive models are not appro-
priate, e.g., multiple regressions.

Although this concludes the presentation of the technical rules of
validation discussed by Nunnally, there is an implicit fourth rule. This
rule is discussed by all test builders, those who construct survey instru-
ments, and everyone who publishes results of any empirical work. This
rule is that of generalizability of findings. This means that the type of
population upon whom one builds his test instrument, his survey questionnaire,
or his valid construct, forms the same general population to whom one can
generalize his findings or results. One cannot measure chickens and infer
to the Chinese nation. Therefore, we are including an implicit fourth
general rule.

Rule 4: Determining the generalizability of the construct.

All behavioral science research is concerned with samples of content,
population, and time. The original study of Lenski's, as well as this
validation, represent a discrete sample of time. The validation itself
concerns the specific variable content or selection from the "domain of
observables" of occupation, income, education, and race-ethnicity. The
population sampled by Lenski consisted of male heads of household in the
Detroit area. Lenski assumes rather than demonstrates that such a sample
would be representative of the nation as a whole, to which he chooses to
infer his empirical findings. We feel the correspondence of his sample to

the nation should be examined on the basic variables race, income, occupation, and education he uses in his original study. We, therefore, will examine the Detroit population in comparison to the national census data to ascertain the representativeness of a Detroit sample for inferring to the nation as a whole. We will assume, as covered in the sampling techniques described in Appendix D, that the sample selected from the Detroit population is a representative sample of Detroit.

Hypotheses

To obtain further evidence concerning convergent and discriminant validity, discussed by Campbell-Fiske, as well as to assess the measures of Gerhard Lenski and Elton Jackson, hypotheses to compare the relationships between the two methods will be stated. These hypotheses will be tested on the same data; that is, the Lenski method and the Jackson method for establishing status consistent types will be used on the same sample. Statistical comparisons will reflect the significance of any differences detected.

The Lenski method is covered in Appendix B and the Jackson method in Appendix C. A brief summation of their approaches follows:

Lenski: makes empirical observations on individuals on four variables, race-ethnicity, occupation, education, and income. He then computes cumulative percentiles for each of the raw score values for each of the variables. The resultant values, being a function of frequency of occurrence, are then divided into tertiles for each variable. An individual's status type is determined by the configuration of his positions on each of the variables. If all of his ranks are alike, he is a status consistent; if he has one rank deviation on one of the variables, he is a moderate consistent; everyone else is considered inconsistent. Lenski uses four variables to derive three categories of status--consistents, moderate consistents, and inconsistents.

Jackson: makes empirical observations on individuals on three variables, race-ethnicity, occupation, and education. He then codes each of these values for each variable into three categories of high, medium, and low. Individual status configurations are derived therefrom. Status types are determined thusly; if all are alike, you are consistent; if you have two like ranks and a one rank deviation in the third, you are a moderate inconsistent; persons with no like ranks are a type three inconsistent; persons with a two rank deviation are a type four inconsistent. Jackson uses three variables to derive four categories of status types, consistents, moderate inconsistents, no like rank inconsistents, two rank deviate inconsistents.

From the above, we find two different methods being employed to assess status consistency types. Our general hypotheses will reflect comparisons

between these two methods as our approach to using Campbell and Fiske's over-all idea of using multi-methods to assess validity. If the two methods identify the same phenotypes, status consistency types, then you have vali-dated your concept from two separate and independent methods.* The methods reflect their differences in coding, transforming raw observations into status ranks of high, medium, and low. Jackson applies his procedure directly to the raw observed values, Lenski computes a cumulative percentile on each variable before coding as to status ranks. Further, we must control our hypotheses to allow for the fact that Jackson only uses three variables to Lenski's four, albeit Jackson's three coincide with three of Lenski's; and, Jackson has four status type categories to only three for Lenski. These controls will be applied so as to hold down spurious relationships due to these structural differences in methods.

> General Hypothesis: The Jackson method and the Lenski method will identify, through different methods, the same numbers of people by status consistency type.

We will assess this general hypothesis through specifying four null hypotheses for testing. They are:

> Hypothesis 1: (in null form) There is no difference in numbers of people identified by status consistency type when comparing the Jackson three-variable, four-category system to the Lenski four-variable, comparable four-category system.

> Hypothesis 2: (in null form) There is no difference in numbers of people identified by status consistency type when comparing the Jackson three-variable, comparable three-category system to the Lenski four-variable, three-category system.

> Hypothesis 3: (in null form) There is no difference in numbers of people identified by status consistency type when comparing the Jackson three-variable, four-category system to the comparable Lenski three-variable, comparable four-category system.

* It appears, because they use the same variables and raw measures thereof, that the two methods are not "maximally different" as required by Campbell and Fiske; however, this should be even more reason why they should identify the same phenotypes.

Hypothesis 4: (in null form) There is no difference in numbers
of people identified by status consistency type when comparing
the Jackson three-variable, comparable three category system
to the comparable Lenski three-variable, three-category system.

Since E. Jackson and G. Lenski use different numbers of variables and
collapse their results into different numbers of categories or classifica-
tions of status consistency types, we opt for a hypothesis procedure as
outlined and explained below.

We first examine both methods, one with three variables and the other
with four, by varying their categories or classifications. We thus collapse
the four categories of Jackson's into the comparable three category schema
used by Lenski and then extend the Lenski categories to a comparable four of
the Jackson schema. We then make the same types of comparisons but between
the two methods when their variables are the same. In other words, we remove
the variable of income from the Lenski computation and then apply the same
procedures and comparisons as before. Therefore, if the addition of the income
variable or the two different classification schemas, the three categories
versus the four categories, actually affect the two methods appreciably in
identifying status consistent types we should discover it with these hypotheses.
Otherwise, there should be no statistically significant differences in the
status type identifications by the two methods. Therefore, rejection of our
null hypotheses of no difference will strengthen the credibility of our implied
alternative hypothesis (to our general hypothesis); that the Jackson Method
and the Lenski Method do identify different numbers of people by status con-
sistency type. All four null hypotheses are needed to demonstrate this due
to the structural differences in the methods of Lenski and Jackson.

Summarily we might demonstrate the hypotheses we will examine:

Three Taxonomic Categories
of Status Consistents:

a) with Jackson's three variables and Lenski's four;

b) with Jackson's three variables and Lenski's recomputed less income.

Four Taxonomic Categories
of Status Consistents:

a) with Jackson's three variables and Lenski's four;

b) with Jackson's three variables and Lenski's recomputed less income.

Of course, we note that we cannot compute what Jackson's schema might demonstrate since he failed to indicate how he would measure the income variable. Therefore that portion of a comparison cannot be computed.

The statistic selected to measure the difference between these two methods is Chi-Square, a nonparametric statistic. The Contingency Co-efficient will be used to assess the strength of association between the component variables. These statistics were selected because both the Lenski and Jackson methods transform ordinal observation data into nominal classification types. Nonparametric statistics are appropriate for nominal levels of measurement.

Data

The data for the original study of Gerhard Lenski, discussed in this thesis, as well as the data for this thesis was taken from a study of the Detroit area, Wayne County, Michigan. The survey data for this thesis was collected in the fall of 1956 and the spring of 1957. Grants from the Ford Foundation and the Horace H. Rackham School of Graduate Studies, University of Michigan facilitated this research by funding the data collection.

With both the Lenski data and the data for this study, the sample population for interview was selected using a multi-stage area probability approach. Primary sampling units were precincts, stratified as to ethnic heterogeneity or homogeneity and past history of voting preference; Republican, mixed, or Democratic. Random sampling techniques were employed to select blocks within precincts and dwelling units within blocks. The five hundred and ninety-six interviews Lenski used from the first study were so collected. The two hundred fifty used for this thesis were similarly selected.

The second sample, from which the data for this thesis is taken, was begun one year after the Lenski sample. The same organization, the Survey Research Center of the University of Michigan, collected the data using the same techniques as they had in the first survey used by Lenski. The project leader's report of sampling techniques is contained in Appendix D.

Although we originally requested the same Detroit area sample data as used by Lenski, we were sent the data from the second Detroit area sample survey. Only minor differences were noted between the data samples.

The differences are, first, in Lenski's study the dependent variable of political liberalism was a composite sum score of answers reflecting support of the following questions: (1) a government sponsored health

insurance program; (ii) price controls; and, (iii) a general extension of government powers. The questions which comprised the measure of political liberalism in the second survey were, as measures of agreement with, the following: "(i) the government ought to help people get doctors and hospital care at low cost; (ii) the United States should give help to foreign countries even if they are not as much against communism as we are; and (iii) the government in Washington should stay out of the question of whether white and colored children go to the same school."[12]

The other difference is that Lenski used both the responses of male heads of households as well as the female spouse's responses concerning the male heads of households. This thesis study contains only responses of the male heads of households concerning themselves.

All other variables, such as age, income, occupation, education, and ethnicity, were covered identically in the 1956-1957 area study used in this thesis as they were in the 1955-1956 study of the Detroit area used by Lenski.

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[12] 1956-1957 Detroit Area Study, Project 843, Eldersveld Cross-Section Study of Political Participation.

CHAPTER III

FINDINGS

Introduction

Two of our findings will be discussed in this chapter. The first will
be the results of the application of the rules of construct validation to
the concept status consistency. The second will be the results of our hypoth-
esis concerning the Lenski and Jackson methods of categorizing consistents
as an application of the Campbell and Fiske convergent and discriminant
validity indicators.

Construct Validation

Rule 1: "Specifying the domain of observables."[1]

We are concerned in this thesis with the methodological aspects of
construct validation. This first rule concerns a logical explication of the
concept, status consistency, to its logically lower-level, on a scale of
abstraction, empirical referrents. A discussion of the rules of formal verbal
logic to so derive this as well as the Lenski operationalization qua logic,
is contained in Appendix A to this thesis and will not be discussed further
in the body of this paper.

Rule 2: "Determining to what extent all, or some, of those
observables correlate with each other or are affected
alike by experimental treatments."[2]

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[1] Nunnally, op.cit., p. 87.

[2] Nunnally, op.cit., p. 87-89.

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The following variables, used by Lenski and Jackson to measure status consistency, were correlated with each other and with each of the other variables in the matrix.

(i) the raw observable values for the variables which form the "objective" measures of status consistency; race-ethnicity, income, occupation, and education.

(ii) the coded versions of the variables in (i) above; coded as per Lenski's percentile method.

(iii) the composite sum score of status for individuals, called, by Lenski, the status crystallization score.

(iv) the scaled sum score of the dependent variable, political liberalism, for individuals, called the "Attitude sum score-Dependent variable".

The complete matrix is contained in Appendix G. Each of the types of variables discussed above will be presented in a summary table form with appropriate discussion.

Our first discussion is to examine the inter-correlation among the raw scores of the observables, education, occupation, income, and race-ethnicity for evidence of homogeneity or unidimensionality.

Table 1

Correlation of Raw Scores

Education, Occupation, Income, Race-Ethnicity

	Education	Occupation	Income	Race-Ethnicity
Education	1.000	-.136	.382	-.286
Occupation		1.000	-.173	.087
Income			1.000	-.342
Race-Ethnicity				1.000

Only two of these correlations reach the .30 level, education with income, .382, and income negatively correlated to ethnicity at -.342. There are a total of two positive correlations and four negative ones; hence, no homogeneity (evidence of positive and linear additivity is this subset).

The correlation coefficient indicating income as negatively correlated with race-ethnicity is an artifact of the scoring procedure. Ethnic scores were so coded in raw form that the higher the ethnic score, the lower in status was the individual represented, e.g., blacks were raw score coded at "88" which was reflected in the ninety-second percentile in coding. Income was coded just the opposite so that a person with little or no income received the lowest percentile codings and persons with the highest incomes received the highest. Therefore, we have a situation where individuals high in income status are being compared to persons low in race-ethnicity status, but at the same percentile coding level.[3] This was the coding artifact that makes this correlation only appear negative, when in actuality it is a positive correlation as expected. In other words, one need only ignore the algebraic sign in this particular case to use the correlation coefficient.

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[3]Example: High numerical values, both raw and percentile, indicate high status. So a black with an income of $2000 per annum is given a 5th percentile rating for his income and a 92nd percentile rating for his race; wherein both were to have been coded low status. Therefore, his racial coding should have been some lower number, such as 5, 8, 10, etc. to correspond to low status percentiles computed for income. The result is that a miscoded "low status" individual, coded high and his correctly coded "low" income were paried together in this correlation of "race-ethnicity" and "income" giving us a negative correlation.

Table 2

Correlation of Percentile Coded Scores

		Education	Occu-pation	In-come	Race Eth-nicity
	Education-Lenski	1.000	-.502	.434	-.287
Coded	Occupation-Lenski		1.000	-.512	.151
Coded	Income-Lenski			1.000	-.244
Coded	Race-Ethnicity-Lenski				1.000

Figure two is the intercorrelation coefficients between the same variables as in table one, except these are coded, i.e., the raw values were weighted by transforming them into cumulative percentiles. Here we would expect to find the same relationships between variables as we did in table 1. Overall we find we still have two variables which correlate positively and the balance negatively. However, the values of the correlation coefficients have increased in every case, except for income with race-ethnicity. In this figure we see what happens to variable values when, assuming a continuous variable, a researcher uses the percentile coding/weighting technique. If a researcher can assume that his data is continuous, i.e., can have all possible values between i_0 and i_{0+m}, where m is his predetermined maximum limit, then coding by using cumulative percentiles will not change the relationship between any two single raw values of his variable. If, on the other hand, your variable(s) are not continuous, then your use of the cumulative percentile procedure will force an arbitrary unit measurement relationship which does not

exist.[4] This was magnified in the higher correlation coefficient values obtained when intercorrelating the same variables as in table 1 but after coding/weighting as cumulative percentiles. In other words, a false picture of their inter-correlatedness would be obtained if only the cumulative percentiles correlations were viewed. This should be expected because of the smoothing effect[5] that forming cumulative percentiles based on frequency of observations has over the range of values involved.

Table 3

Correlation of Percentile Coded Scores to Raw Scores

Education, Occupation, Income, Race-Ethnicity

	Coded Education	Coded Occupation	Coded Income	Coded Race-Ethnicity
Education	.973			
Occupation		.307		
Income			.991	
Race-Ethnicity				.844

We also look at the intercorrelation among the cumulative percentile coded variables and the raw variables from which they were computed. Coded

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[4] For example, from the raw scores for occupation, Appendix E, we find all possible values are not represented. Since each occupation value is on the same one unit scale as every other, a break in the possible values for occupation, e.g., 39, other clerical to 49, sales workers, will be reflected in the cumulative percentile values computed. Cumulative percentiles ignore interval distance between values and use only frequency of next higher value.

[5] Smoothing effect refers to the closure between the raw values that occurs when you use percentiles, since percentiles use actual frequencies-they are unconcerned with missing values in the raw score range--hence, the overall range of values (in percentiles) smooths the range into a continuous one represented by percentile points based on frequency distributions-not raw value scores.

education correlates very well at .973 with its raw score counterpart, education. The coded occupation score only correlates at .307 with its raw score counterpart. Coded income and coded ethnicity correlate in the expected manner with their raw score counterparts, .991 and .844, respectively.

We can explain the low correlation between occupation raw scores and occupation coded scores as the result of the "smoothing effect" caused by creating cumulative percentile points on raw score values which do not reflect the same continuity of value points. In other words, the raw occupation score values were a series of groupings throughout their possible range of values. They were not evenly or normally distributed throughout. Therefore, when cumulative percentile procedures were applied, which tends to force a continuous range on its points, we find lack of agreement between the raw and coded values when correlated.

Table 4

Correlation of Status Crystallization Scores and Attitude
Sum Scores (Dependent Variable) To All Others: Raw and Coded

Education, Occupation, Income, Race-Ethnicity

	Crystallization Score	Attitude Sum Score
Education	-.088	-.074
Occupation	.162	-.045
Income	.076	-.033
Race-Ethnicity	-.240	.174
Coded Education	-.100	-.112
Coded Occupation	.038	-.032
Coded Income	.041	-.047
Coded Race-Ethnicity	-.017	.164
Crystallization Scores	1.000	-.034

The total scores, crystallization scores, are represented in table 4. None of the values appear demonstratably indicative, only the ethnicity correlation with crystallization scores reaches a -.240. None of the correlations for the <u>sum score of the dependent variable</u>, an attitude scale of political liberalism, even reaches a .2 level.

The <u>status crystallization scores</u> and the <u>sum score of the attitudinal dependent variable</u> do not reflect any "high" intercorrelation between them. They reflect the heterogeneity[6] of this matrix with positive and negative values.

We can, therefore, conclude from the application of rule 2 that the measures of education, occupation, income, and race-ethnicity do not comprise a homogeneous or unidimensional construct based on the examination of their intercorrelations. The implications of this will be discussed when the balance of the evidence of construct validation has been concluded.

Rule 3: "Determining whether or not one, some, or all measures of such variables act as though they measure the construct."[7]

In this rule we determine if the construct can differentiate among the values of the dependent variable, political liberalism. Tables 5, 6, 7 and 8 are the graphic displays of the values of the raw scores of the variables, income, occupation, education, and race-ethnicity as recorded by Lenski; the coded cumulative percentile scores for the same variables; and the sum or crystallization scores computed according to the Lenski formulation to each of the sum scores for the dependent variable, political liberalism.

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[6] A mixture of positive, negative, high, and low correlation values with no pattern forming between members.

[7] Nunnally, <u>op.cit.</u>, p. 87 and 92.

We are concerned with observing whether the individual variable values, when plotted against the dependent variable of scaled scores of political liberalism, vary in the same manner, i.e., if one is "high", the others are high, etc. If they do, then we say our variables evidence a monotonic relationship with the dependent variable. Monotonic relationships are evidence of homogeneity of the construct, the independent variable. And, as stated before, such evidence of monotonic graphing and homogeneity gives strong evidence that our construct, status consistency, is unidimensional and can be treated as a linearally additive construct. The significance of this is that parametric statistics for continuous data, with their stronger inferential statements, can be used when applying status consistency as an independent variable.

In Table 5 neither income, the line of interconnected dots, nor education, the line of interconnected x's, differentiate appreciably, until after a sum score of 8 is attained on the dependent variable. This means that only income shows some discriminatory ability at the high end of the political liberalism scale, the liberal or low value end. Education is less helpful, excepting for political liberalism numerical scale scores of 4, 10, and 15, it makes no differentiation at all among this scale. The combination of education and income seem somewhat complementary, each differentiates at a different end of the political liberalism scale scores.

Occupation and ethnicity, in Table 6, do exhibit some ability to differentiate. Occupation, the line of interconnected x's, does exhibit some differentiation but with no regular pattern. Occupation's irregular pattern is not matched, however, by race-ethnicity's; therefore, the variables in this table are not monotonic either. Race-ethnicity, seen in the series of interconnected dots, tends to differentiate only slightly among the political

THIS BOOK CONTAINS NUMEROUS PAGES WITH DIAGRAMS THAT ARE CROOKED COMPARED TO THE REST OF THE INFORMATION ON THE PAGE.

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Table 5

Education and Income Raw Scores
by Political Liberalism
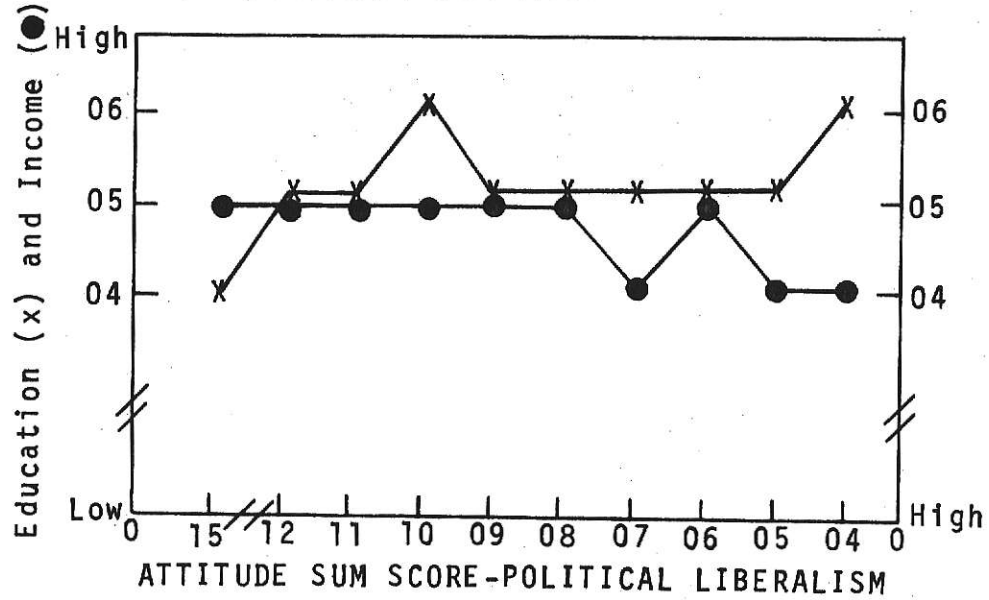
Occupation and Ethnicity Raw Scores by
Sum Scores for Political Liberalism
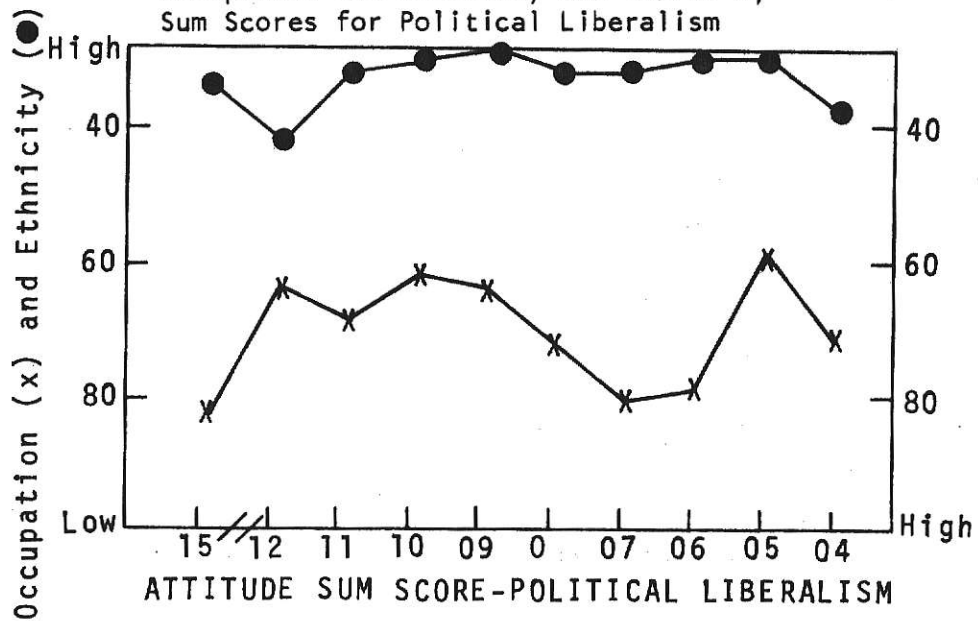
Table 6

liberalism scale sum scores.

Table 7 shows us the effect we have when we convert raw scores to per-
centiles and permit the smoothing effect, created by basing one's variable
values on the frequency of occurrence of raw scores, to determine independent
variable values. We do, in fact, have greater differentiation among the
attitude sum scores of political liberalism; but we also note we do not have
any evidence of a monotonic relationship existing among any of the indepen-
dent variables with the dependent variable.

Table 8 reflects the ability of the crystallization sum scores of
general status rank to differentiate. We find little discriminatory ability
between the political liberalism values of 11 to 7; some discrimination at
the high or liberal end of the liberalism sum score values of 6, 5, and 4,
and an interesting, but not discriminating, occurrence between the least
liberal sum score of 15 and the highest crystallization score, also theoret-
ically the least likely to want change, of nearly sixty points.

None of the variables in tables 5, 6, 7, or 8 indicate a monotonic,
similar in discriminatory ability, effect with the dependent variable scale
sum scores of political liberalism.

However, before we leave the graphic presentations, we should examine
the correlation of the items of the dependent variable, the scale of political
liberalism. In order for our construct validation rules to be effective, we
should be plotting our independent variable values against a unidimensional
dependent variable construct. The reason for this assumption of unidimen-
sionality is we must have a predictable base against which to plot the dis-
criminatory ability of our independent variables. Only with such a base, a
linear and additive one in the case of unidimensionality, can we make compar-

Table 7

Education, Occupation, Income, and Ethnic Percentiles
by Sum Scores for Political Liberalism.

ATTITUDE SUM SCORE - POLITICAL LIBERALISM
Education=●; Occupation=x; Income=y; Ethnic=z.
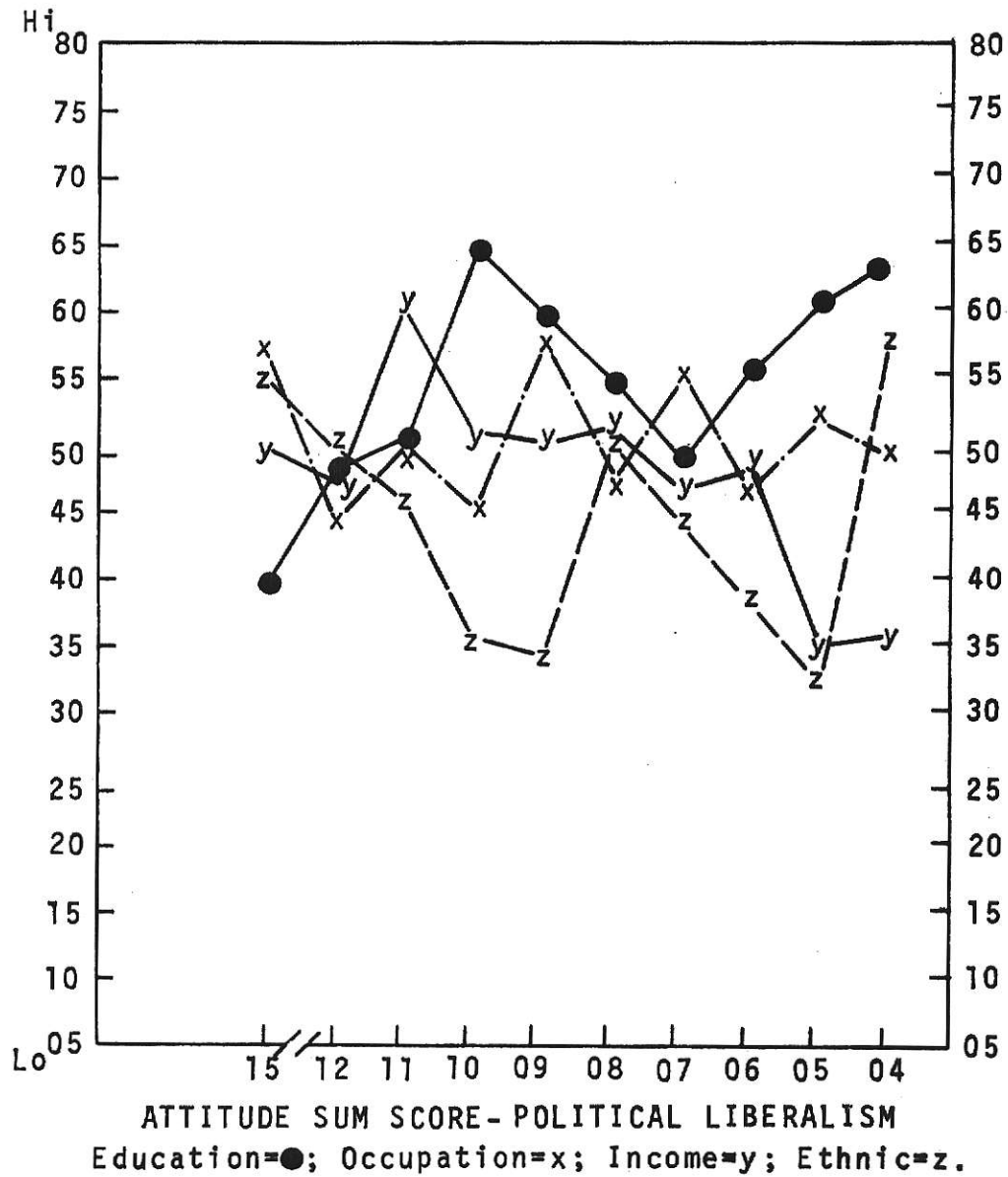
Table 8

Crystallization Scores by Sum Scale Scores for Political Liberalism

ATTITUDE SUM SCORE-POLITICAL LIBERALISM
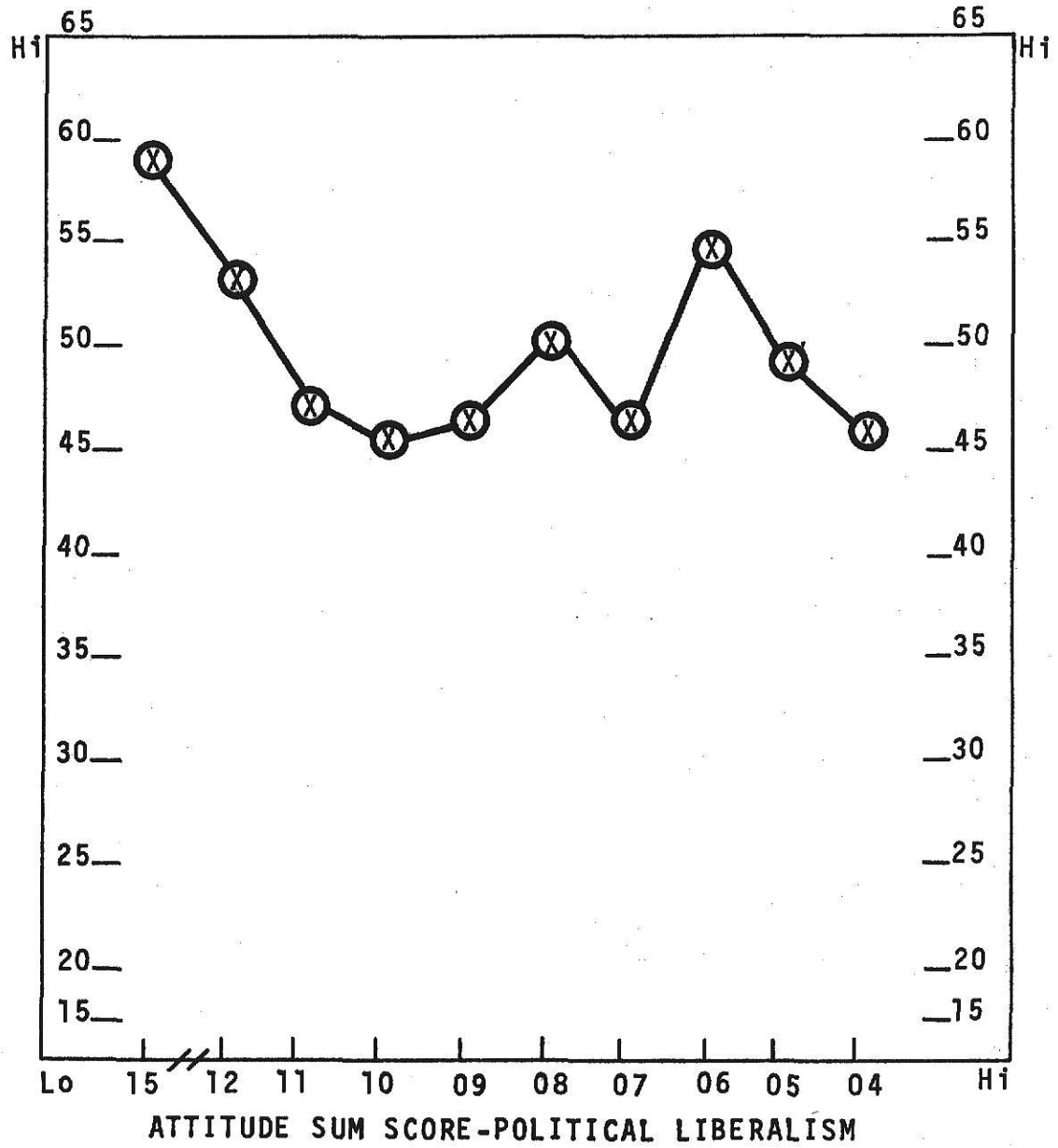
Crystallization scale scores = Ⓧ

isons between the relative ability of different independent variables to discriminate among the dependent variable scores. Without this base, we have no comparison measure except the relative comparison between different variables' paths when plotted against the dependent variable. Table 9 was prepared on the three item scale of political liberalism to assess its unidimensionality. If it meets these criteria, it should reflect "high", over .50 but less than .90[8], intercorrelations among its variables referred to as items in Table 9.

We note significance levels are computed for each of the correlation values. Two of the correlations, Items 1 and 2 to Item 3, are significant at .03 and .01, respectively.

However, viewing these items as a functional whole, we do not find what we should expect. If this were a scale, then this evidence of internal consistency through item to item correlations, also referred to as a measure of a scale's unidimensionality, should have resulted in the items showing higher intercorrelation values among themselves. Their means vary only one point and their standard deviations vary only by .071. These latter two facts would be quite desirable in building a unidimensional scale, but we can see that the three items above are each measuring or indicating something different. The highest inter-item correlation is only .1468, which indicates that only slightly more than 2% of the variance of these two items could be

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[8]Interpreting correlation values was discussed in Chapter 2 under this rule. Point nine zero would indicate communality, and point five zero is simply midway on the possible correlation scale of 0 to + 1.000 (sign of direction being ignored).

explained[9] by their covarying. This also indicates that the maximum common overlap in their variance distributions can only attain slightly under 15%. The overlap is so small, these items must be considered items of a heterogeneous construct or composite.

Table 9

Correlation
Lenski's Three Item Scale
of Political Liberalism

	Item 1	Item 2	Item 3	Mean	Std. Deviation
Item 1	1.0000	.0415	.1188	2.508	1.820
Item 2		1.0000	.1468	3.468	1.891
Item 3			1.0000	3.580	1.883

Item 1 to Item 2; correlation significant at .257
Item 1 to Item 3; correlation significant at .030
Item 2 to Item 3; correlation significant at .010

Referring back to our discussion of the graphic tables, this discovery concerning the dependent variable adds some confusion to the interpretation. Specifically, if we had a dependent variable that was a unidimensional measure and whose composite score and individual items were all positively inter-correlated, we could plot the independent variables of our independent variable construct against it and be more assured that we were observing their, the construct's, variation against a variable with a more predictable distribution. Table 10 on the next page presents the dependent variable scores and their frequencies.

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[9]Explained variance equals r^2, the correlation coefficient, squared; therefore, .1468 squared = .0215 or 2%.

Table 10

Political Liberalism

Political Liberalism Sum Scores	Frequency	Percentage
04	12	5.4
05	13	5.8
06	26	11.7
07	39	17.5
08	40	17.9
09	23	10.3
10	27	12.1
11	20	9.0
12	16	7.2
.		
.		
.		
15	07	3.1

We can see that this is not a normal distribution of sum score values. The frequency of this distribution peaks just short, numerically, of the mean sum score of 8.3, with the frequency of 40. It then drops sharply to a frequency of 23, or from 17.9% to 10.3%. A slight rise at the score value of 10, frequency 27, to 12.1% interrupts the overall decreasing trend from eleven to fifteen sum score totals, from 20 to 7 in frequency and 9.0% to 3.1% of the total number. Because the intervening values between sum score of 12 and 15 were only represented by one and two people, they were omitted from the graphs.

The scale seems biased toward the liberal end of its values, i.e., the low scores. Note after beginning with a frequency of 12, 5.4% of the total N, at sum score 04, our sample quickly reaches its maximum frequency values of 39 and 40. Also, over 58% of the total sample is represented in the frequencies for the first low scale sum scores, 04 through 08.

We did not find evidence of a monotonic relationship between individual variable values, either raw or coded, and our dependent variable, political

liberalism. This is further evidence which supports the findings from Rule 2 of lack of homogeneity of this construct, status consistency. However, these findings are clouded because we also have discovered that our dependent vari- able, political liberalism, is not a unidimensional construct either. There- fore, this makes comparison between independent variables plotted on the same graph difficult. However, when individual independent variables are compared to the dependent variable, we will not find any evidence of mono- tonic graphing or, hence, homogeneity. Also our distribution of dependent variable scores is skewed toward the liberal end, the low values, of its scale. This only indicates that whatever our dependent variable is measuring, persons in this sample tend to score more "liberally", i.e., at this end of the scaled score values.

Rule 4: Determining the generalizability of the construct to a population.

We now compare the replicated sample for this thesis of the Detroit area study to the United States Bureau of the Census figures for the Census of 1960. When examining Table 11 by the variables of age, income, education, occupation, and race, the last four being the variables of interest in the study, we will observe the closeness of fit of the Detroit sample to the nation's population distribution on similar categories. Through this exam- ination we will determine the applicability of findings from a study of the Detroit area to the nation as a whole. Only differences will be discussed.

Table 11: Comparison Between Sample Populations

Comparison between sample population demographic characteristics and those of the nation as a whole, according to the 1960 census.*

Age	Detroit Sample	1960 Census	Income	Detroit Sample	1960 Census
21-24	6.0	12.6	Less than $1000	10.0	11.2
25-29	13.6	13.2	$1000-$1999	5.6	9.7
30-34	10.4	12.4	$2000-$2999	4.4	8.6
35-39	12.0	12.2	$3000-$3999	11.2	10.9
40-44	12.4	11.0	$4000-$4999	18.4	13.0
45-49	9.2	9.9	$5000-$5999	13.6	14.4
50-54	10.4	9.0	$6000-$6999	13.2	10.6
55-59	8.0	7.9	$7000-$9999	17.6	13.8
60-64	10.8	6.5	$10,000 +	6.0	8.6
65 +	7.2	5.3			

Education	Detroit Sample	1960 Census	Occupations	Detroit Sample	1960 Census
None	1.2	2.0	Professional	12.0	12.6
1-4 years	6.8	5.5	Farmer	0.0	.5
5-6 years	8.0	7.1	Managers	14.8	12.5
7 years	2.4	6.6	Clerical	9.2	8.8
8 years	17.2	17.9	Sales	2.0	8.5
9-11 years	21.6	18.9	Craftsmen	27.6	21.3
12 years	23.6	22.2	Operatives	27.2	20.7
1-3 years college	10.0	9.1	Private Household and Service	5.6	8.2
4 years college	6.4		Farm Laborers	0.0	0.0
Graduate work	2.8	10.9	Laborers	1.6	6.9

Race (Urban)	Detroit Sample	1960 Census
White	84.8	88.2
Non-white	15.2	11.0

* All values expressed in percentage points.

Age, for example, varies only from .1 to 2.0 percent in the 25-59 year range. However, both extreme age groupings, 21-24 and 60 and above, vary considerably, 6.6 and 6.2 percentage points, respectively. Stated in terms of the sample, the sample population is underrepresented in the 21-24 age grouping, in comparison to the national distribution, and overly represented in the 60 and above year range.

Income is within 1.2 percentage points on the lowest categorization, less that $1000, and further underrepresented through the $2999 range by some 8.3 percentage points. However, on the $3000 through $9999 range, the Detroit sample overrepresents these categories by 12.1 percentage points, except for the $5000-$5999 range which is slightly underrepresented, .8 of a percentage point. The $10,000+ category is again underrepresented by 2.6 points.

Education demonstrates a slight oversampling for the first six years of schooling, 2.2 percentage points and a gross undersampling in the 7 year category by some 4.2 points. Those completing four years of secondary education, 9-12 years, are overrepresented by slightly more than 4%, 4.1 points. All levels of higher education only reflect a slight undersampling, .8 of a point.

Occupations tend to be oversampled or overrepresented at the higher, status-wise, end of the rankings, with the exception of sales, terminating with operatives, the last skill-related category. The minimal skill and labor categories are underrepresented by some 7.9 percentage points.

Race reflects an oversampling of more than 4 points among the non-white.

Therefore, we would have to say that our sample would be older on the average than one would expect from a national sample. It reflects a pre-ponderance of middle income persons, underrepresenting both income extremes.

Our education categories reflect complementary bimodal points, we have under-sampled by 4.2 points the 7 years category but oversampled the 9-12 years group by some 4.1 points. Therefore, the sample reflects more high school educated respondents at the expense of the 7 years group. Our sample also tends to be weighted to the higher prestige occupation positions and reflects nearly 50% more non-white respondents than would be found in a national sample.

The implications for generalizability are that we would be making state-ments, if based on this sample population, on data from persons who are better educated than the national average, who occupy more positions involving skill and/or prestige, earn more money in the middle range incomes, are slightly older, and less white than a total national sample of respondents would reflect.

Using prescribed rules for establishing construct validation has indi-cated, so far, that our construct status consistency, as currently operation-alized by G. Lenski, is not a homogeneous construct. It does not reflect unidimensionality among its constituent variable measures, and, in fact, does not evidence any of the standard characteristics expected of a scientifically derived index of measure; unidimensionality through relatively "high" inter-item correlations, inter-item correlations higher within the constituents of the index than with any variable outside the index, and evidence of homo-geneity, linear additivity, both algebraically and graphically.

Hypotheses Tested

We are attempting to assess the validity of the concept status consistency by measuring the convergence of two methods of measurement, that of Gerhard Lenski and Elton Jackson. Because Lenski and Jackson have some differences structurally in their methods, we will indicate how these differences can be controlled so the basic hypothesis may be tested.

First, Jackson uses four taxonomic categories of status consistent-inconsistent types. They are Consistent (1), Moderate Consistent (2), Inconsistent (3), Inconsistent (4).[10] Lenski uses three taxonomic categories for status consistency, which are Consistents (1), Moderate Consistents (2), and Inconsistents (3).[11]

Secondly, Lenski uses *four* variables, education, income, occupation, and race-ethnicity. Jackson uses only three, education, occupation, and race-ethnicity.

The following schematic indicates the required comparisons between the two methods given the two differences described above along with the table numbers wherein these comparisons are made.

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[10] Jackson consistents = all ranks alike;
  Jackson moderate consistents = two ranks alike with one rank, only 1 step difference;
  Jackson *inconsistent* (3) = no like ranks;
  Jackson inconsistent (4) = any 2 step difference (see Appendix C)

[11] Lenski consistents = all ranks alike;
  Lenski moderate consistents = any one rank one step difference
  Lenski inconsistents = all others (see Appendix B)

	Three Taxonomic Categories		Four Taxonomic Categories	
	Lenski 4 variables	Lenski 4 variables minus income	Lenski 4 variables	Lenski 4 variables minus income
Jackson 3 variables	13	15	12	14
Jackson 3 variables plus income	Not testable	Not testable	Not testable	Not testable

From our previous discussion in Chapter Two, we remember that the entire bottom row of probable tables is not possible because Jackson did not use or give any indication of how he would operationalize the income variable. Therefore, we cannot create a comparable dummy table for this.

The first null hypothesis:

'There is no difference in numbers of people identified by status consistency type when comparing the Jackson three-variable, four category system to the Lenski four-variable, comparable four-category system.'

is rejected, as seen in Table 12. Therefore, when comparing the two methods, Jackson and Lenski, by the same four taxonomic categories, though different numbers of variables, we can conclude that there is a statistically significant difference in the numbers of people identified by status consistency type. This could be related to one of two causes: first, the additional variable of income used by Lenski provides further differentiation among status types; or, secondly, the methods themselves are sufficiently different so as to identify different groups.

The second null hypothesis:

'There is no difference in numbers of people identified by status consistency type when comparing the Jackson three-variable, comparable three category system to the Lenski four-variable, three category system.'

Table 12

Comparison of Jackson and Lenski II Methods of Identifying
  Status Consistency Types

Jackson (3 variables)		Consistents 1	2	Inconsistents 3	4	Total
1		20	10	0	0	30
Consistents	RP	67%	33%	0%	0%	100%
	CP	41%	9%	0%	0%	14%
	E	7	15	4	4	
2		19	44	4	11	78
	RP	24%	57%	5%	14%	100%
	CP	39%	41%	15%	34%	36%
	E	18	39	10	11	
3		8	29	6	9	52
	RP	15%	56%	12%	17%	100%
Inconsistents	CP	16%	13%	22%	28%	24%
	E	12	26	6	8	
4		2	25	17	12	56
	RP	4%	45%	30%	21%	100%
	CP	4%	37%	63%	38%	26%
	E	12	28	7	9	
TOTAL		49	108	27	32	216
	RP	22%	50%	13%	15%	100%
	CP	100%	100%	100%	100%	100%

L*
ENSKI II

RP = Row percent; CP = Column percent; E. = Expected cell values.
Chi Square = 55.86 with 9 degrees of freedom
Alpha at .05 level of significance = 16.92
Contingency coefficient = .45
* 4 variables

Table 13

Comparison of Jackson and Lenski II Methods of Identifying Status
Consistency Types

Jackson (3 variables)		Consistent 1	Moderate Consistent 2	Inconsistent 3	Total
Consistent 1		20	10	0	30
L *	RP	67%	33%	0%	100%
E	CP	41%	9%	0%	14%
N	E	7	15	8	
S					
K Moderate 2 Consistent		19	44	15	78
	RP	24%	56%	20%	100%
	CP	39%	41%	25%	36%
	E	18	39	21	
Inconsistent 3		10	54	44	108
	RP	9%	50%	41%	100%
	CP	20%	50%	75%	50%
	E	24	54	30	
TOTAL		49	108	59	216
	RP	14%	50%	36%	100%
	CP	100%	100%	100%	100%

RP = Row percent; CP = Column percent; E = Expected cell values

Chi Square = 50.92 with 4 degrees of freedom
Alpha at .05 level of significance = 9.49
Contingency Coefficient = .43
*4 variables

is also rejected as noted in Table 13. There is a statistically significant difference in the numbers of people identified by status consistency type when using the two methods when using the same three taxonomic categories but with different, i.e., four and three, variables in each. This table indicates that the Jackson method, even less the income variable, does give greater differentiation among the inconsistent categories than does the Lenski.

Hypotheses three and four deal with the same comparisons except that we are now using only the same variables, those of Jackson, i.e., race-ethnicity, occupation, and education, dropping income, in computing status consistency types.

The third hypothesis:

'There is no difference in numbers of people identified by status consistency type when comparing the Jackson three-variable, four category system to the comparable Lenski three-variable, comparable four-category system.'

is rejected, Table 14. Our statistically significant difference between methods still holds even when both methods use the same variables and the Jackson 4 category taxonomic classification schema. Table 14 reflects this finding. You should note that the Lenski categories were also based on the four taxonomic categories of Jackson; however, in this case, none of the cases would have been classified as a Jackson Type 4 inconsistent, ergo we have no bottom row of all zeroes on the table. Their exclusion does not bias the computation.

Table 14

Comparison of Jackson and Lenski II Methods of Identifying
  Status Consistency Types.

Jackson (3 variables)		Consistents 1	2	Inconsistents 3	4	Total
L** 1		34	16	0	1	51
E Consistents	RP	67%	31%	0%	2%	100%
N II	CP	65%	15%	0%	3%	23%
S	E	12	25	6	8	
K 2		18	79	15	30	142
I	RP	13%	56%	10%	21%	100%
	CP	35%	72%	56%	91%	64%
	E	33	70	17	22	
Inconsistents 3		0	14	12	2	28
	RP	0%	50%	43%	7%	100%
	CP	0%	13%	44%	6%	13%
	E	7	14	4	3	
TOTAL		52	109	27	33	221
	RP	24%	49%	12%	15%	100%
	CP	100%	100%	100%	100%	100%

RP = Row percent; CP = Column percent; E = Expected cell values.

Chi Square = 71.16 with 6 degrees of freedom
Alpha at .05 level of significance = 12.59
Contingency coefficient = .49
** 3 variables

Using only the three variables of Jackson and his four category taxonomic classification schema, we lose most of the ability to identify inconsistents when we compute categories according to Lenski's formula. Note the marked change in Row Three of the preceding table and the complete absence of a Row Four, which would be inconsistents Types 3 and 4, respectively according to Jackson's taxonomy and when the rows were combined would equal Lenski inconsistent category.

The fourth hypothesis:

'There is no difference in numbers of people identified by status consistency type when comparing the Jackson three variable, comparable three-category system to the comparable Lenski three-variable, three-category system.'

is also rejected, Table 15.

The same phenomena as observed in Table 14 has also occurred here compounded by the effect of collapsing Jackson taxonomically inconsistent categories of three and four into one Lenski category 3 so that the weight of their units, cases, are now reflected in one category instead of two.

The contingency coefficients have been reported but not discussed to this point. For nonparametric statistics they reflect a measure of correlation between the variables.[12] The interpretive significance of these Contingency coefficients lies in the fact that they do indicate a higher correlation between methods when using only the three variables, Tables 14 and 15 in both methods. The slightly higher correlation noted when using the Lenski three-category classification in the three variable tables may be only a function of collapsing the categories from four categories to three. When the mixed variable tables are compared, i.e., using the 4-variable Lenski

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[12] For a discussion of the maximum values possible for each computation of a Contingency Coefficient, see Siegel, Nonparametric Statistics. (New York: McGraw-Hill Book Company, 1956), p. 201.

Table 15

Comparison of Jackson and Lenski II Methods of Identifying Status Consistency Types.

Jackson (3 variables)		Consistent 1	Moderate Consistent 2	Inconsistent 3	Total
Consistent 1		34	16	1	51
L * E	RP CP E	67% 65% 12	31% 15% 25	2% 2% 14	100% 23%
N Moderate					
S II 2		18	79	45	142
K Consistent I	RP CP E	13% 35% 33	56% 72% 70	31% 75% 39	100% 64%
3		0	14	14	28
Inconsistent	RP CP E	0% 0% 7	50% 13% 14	50% 23% 7	100% 13%
TOTAL		52	109	60	221
	RP CP	24% 100%	49% 100%	27% 100%	100% 100%

RP = Row Percent; CP = Column Percent; E = Expected cell values
Chi Square = 75.5126 with 4 degrees of freedom
Alpha at .05 level of significance = 9.49
Contingency Coefficient = .54
* indicates 3 variables

computation scheme with the 3-variable Jackson scheme in tables 12 and 13, the differences in correlation based on taxonomic categorization scheme, i.e., into three or four consistency types, reverses itself. Table 12 with the Jackson four category taxonomic system reflects a slightly higher correlation than when the same computation system uses the Lenski taxonomic categorizations.

We can conclude, therefore, from this four table examination that the method for measuring status consistency of Gerhard Lenski and the method for measuring status consistency used by Elton Jackson do not identify the same individuals by status consistent types. This is true even when similar taxonomic categorizations and variables are used. Therefore, we do not have evidence of our two methods showing convergent validity for the concept, because they do not identify the same status phenotypes. This is even more significant when you consider that the methods of Jackson and Lenski hardly classify as "maximally" different, the requirement posed by Campbell and Fiske when testing for convergent validity. Since "maximally" was never defined, it can only logically be assumed to have been a condition other than that of Jackson and Lenski where we find them using the same variables, with one exception, and essentially the same taxonomic classification schema. However, their similarity in method does permit us, with these findings, to more adequately focus on the reason for their failure to identify the same status phenotypes, which could be:

    (1)   the failure of our mathematical procedures, i.e., assignment of measurement values to the raw variables;

(ii)   the inappropriate designation of dichotomies or trichotomies to continuous data, instead of using "natural" dichotomies[13]; and/or,

(iii)   the invalid operationalization of our concept, status consistency.

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[13]For discussion of natural dichotomies, see Paul F. Lazarsfeld, "Regression Analysis with Dichotomous Attributes" and "Comments". Social Science Research 1 (1972), 24-34, 421-427.

CHAPTER IV

CONCLUSIONS AND IMPLICATIONS

Validation

We shall begin with the qualification statement by the leading pro-
ponent in construct validation, Nunnally, stated below.

> 'A construct is only a word, and although the word may suggest
> explorations of the internal structure of an interesting set
> of variables, there is no way to prove that any combination
> of those variables actually "measures" the word. . . .the
> evidence obtained is not so much proof of the truth of the
> theories as it is proof of their usefulness as guides to
> empirical reality.'[1]

Thus, in terms of the rules of validation, we were primarily only con-

cerned with the selection of variables made by Gerhard Lenski and if they

would stand the test of validation procedures.

We have evidence that this particular configuration of variables,

income, occupation, education, and race-ethnicity, as measured by Gerhard

Lenski's sum score of agreement, reflected in a single overall general status

rank score, is not the homogeneous, unidimensional scale some have presumed.

Our first two points derived from the rules of validation indicate our reason-

able doubt.

First, the intercorrelations demonstrated, according to rule 2, were

not "high", i.e., they were not all positively correlated with each other or

at a meaningful level of correlation. Referring back to our discussion of the

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[1]Nunnally, op.cit., p. 98.

correlations and their values, the test of meaningfulness lies not in the statistical significance of any one correlation value but in their overall configuration. The lack of high positive intercorrelations demonstrates a lack of internal consistency between the variables, their relationships do not covary closely with one another.

Secondly, the evidence from the graphics on the ability of the variables to differentiate among the dependent variable scores from rule 3 again reflects the heterogeneity of this particular construct of variables. The variables do not differentiate among the dependent variable scores in the same way. Thus, they are not homogeneous. Not being homogeneous, a researcher cannot speak of this construct as a unidimensional measure. And thusly, the statistical techniques applicable to homogeneous or unidimensional measures are just not applicable to this construct when composed of this combination of four variables.

The final point, or the fourth implied rule, concerns the generalizability of the findings. Construct validation generalizability is just as dependent on the sample composition as are findings from other research studies. We do not have evidence that the population sample was clearly reflective of the social structure of the nation. However, one difficulty lies in the fact that only evidence from male heads of household could be utilized.

With the rising number of females in the labor market today, it would seem that this validation population would have to constitute both sexes today; or it could not be said to be reflective of the general populace.

The principal qualifying factor, in terms of results, is that the dependent variable did not reveal itself to be homogeneous either. Thus, the graphics interpretation had to be approached with caution because there

was no highly, i.e., positive and linearally additive, unidimensional set
of scores to differentiate among. However, evidence from the intercorrela-
tions reflected sufficient heterogeneity to be able to state, with some
qualification, that the construct comprised of the variables of race-ethnicity,
income, occupation and education can be considered a valid heterogeneous con-
struct, a qualified useful guide to the empirical phenomena called status
consistency-inconsistency.

The inclusion of the hypotheses regarding two different methods was to
attempt to apply the principles of Campbell and Fiske's multi-method meas-
urement of convergent and discriminant validity. Theoretically to measure
convergent validity, we should have two measures of maximally different
methods. Definitionally, as discussed in Appendixes B and C, we did not have
"maximally" different methods. However, their lack of agreement in identi-
fying status consistency types indicates more difference in the methods than
was observable based solely on their definitions.

As Tables 12 through 15 indicated, the use of all four variables, within
the Jackson 4 taxonomic category schema, would provide the best discrimina-
tory ability for this concept. However, we were concerned with the Lenski
operationalization, which uses all four variables, race-ethnicity, income,
education and occupation. Our selected second method, Elton Jackson's, to
provide a multi-method validation approach to this construct only had three
variables. Therefore, our discussion must be qualified by that factor. We
did learn, however, that the two methods do not identify the same persons,
label the same individuals, by status consistency type. Since the only
direct comparison between the methods was when we deleted one of the original
variables, income, we cannot be sure that the difference in identification

was a result of the different methods or the result of failing to include the income variable.

Evaluation of Concept or Validation Process

We began this project to apply the rules of validation to a construct, the concept of status consistency-inconsistency, with the goal of reducing its ambiguity. We used a replication sample of the same population, variables, and data base as did Gerhard Lenski, the concept's first operationalizer. We have discovered that:

1) the Lenski research design did not encompass the techniques required for validation of a construct, specifically Rule 1-specifying the domain of observables;

2) the dependent variable, political liberalism, was not established as a homogeneous construct, it had little internal validity or consistency-which violates Rule 3-where we are to be able to observe if our variables can differentiate among the dependent variable;

3) assumptions were made about the operation of the variables in the construct which were never examined; violation of Rule 2-where we examine their intercorrelations to establish homogeneous, unidimensional constructs;

4) the population to which we were supposed to generalize cannot, on the basis of our sample, be said to be representative of the nation as a whole-a violation of our Rule 4;

5) the multi-method approach of assessing convergent validity indicated that the Lenski and Jackson methods actually identify different groups of people by status type-indicating more work on clarification of methods.

Therefore, on the basis of this analysis of the sample concept of status consistency-inconsistency, we must conclude that the validation has indicated that until we can apply our tests, the rules of validation, to the concept with a unidimensional dependent variable, the most we can say about this construct is that it can be treated as a heterogeneous construct

of the general rank consistency type, a measure of agreement summed into
an overall general rank score for the individual. Anyone using this con-
cept should be advised that until a complete validation can be made, the
Lenski and Jackson methods of measuring status consistency-inconsistency
result in different individuals being identified by status type. Therefore,
fruitful comparisons of empirical findings between research using Lenski's
method and research using Jackson's method cannot be made at this time.

The application of the rules of validation for a construct to this
construct was successful. The problems and errors of measurement and
validation were revealed. The project was a success.

Implications

Because of the discrepancies in the research design, the following
should be considered as fruitful areas of research in the immediate future.

1) establishment of a homogeneous, unidimensional measure of
political liberalism (or some other theoretically related
dependent variable);

2) application of both the Lenski and the Jackson methods to
status consistency data, running an empirical validation
on the measure developed in (1) above;

3) use the multi-method convergent and discriminant validity
approach, i.e., use the Jackson four taxonomic category
system with the Lenski computation formulae and the Lenski
three taxonomic category system with the Jackson computation
formulae.

Probably the most significant long-range benefit from this research
has been the demonstration of the relatively simple techniques required to
establish empirical validation of a construct. Hopefully, this author, and
others, will use and encourage the use of these techniques so that the
disciplines of the social and/or behavioral sciences can meet the goals of

science, the acquisition of cumulative additive research, through unambig-
uous concepts with demonstratably empirically valid measures.

APPENDIX A

The Origin Of The Concept

Benoit-Smullyan first advanced the idea of "status equilibration" by saying:

> 'As a result of status conversion processes which are normally at work in every society, there exists a real tendency for the different types of status to reach a common level, i.e., for a man's position in the economic hierarchy to match his position in the political hierarchy and for the latter to accord with his position in the hierarchy of prestige, etc. . . .We, on our part, have defined status as relative position in a hierarchy and have distinguished carefully between the three chief hierarchies and the corresponding three types of status.'[1]

He further suggests that only within the framework of equilibration theory can the concept of social status be given meaning:

> 'Social status is the limiting term of the status equilibrating process: it is the status which would exist if the equilibrating process were to be completed and if a perfect equilibrium status structure were present.'[2]

A suggested empirical referrent for his idea is given:

> 'A first approximation to it would be obtained by taking an average of the separate economic, political, and prestige statuses of the individual or group in question. Closer approximations would be achieved by introducing corrections based on existing conversion tendencies properly weighted according to their relative potency. . .we would certainly favor the use of specific status categories wherever possible, and an avoidance of the term social status unless the undifferentiated form is specifically meant. . .it will be desirable to remember that, while a simple average (of the three specific statuses) may yield

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[1] Emile Benoit-Smullyan, "Status, Status Types and Status Interrelations." American Sociological Review 9 (No. 1, 1944), p. 160.

[2] Ibid.

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an approximation adequate for certain purposes, a more exact estimate will require a judgment as to the strength of the various currents of conversion, and the relative importance of each status type in a given society and a given period. [3]

Benoit-Smullyan implies that the equilibrium status structure is the optimum model for a given societal social structure because, otherwise, "There are historical grounds for supposing that when legal, customary, or other barriers seriously hamper the equilibrating tendency, social tensions of revolutionary magnitude may be generated."[4] He specifically cites the examples of the French revolution and the rise of Nazi Germany as ostensive.

Let us briefly summarize some key points for later comparison with other writers.

(1) Status is viewed as a combination of ranks on a number of different hierarchies in which the individual or group's position may be described or located relative to everyone else;

(2) The equilibrating process of status conversion is where, if a perfect status structure were present, individuals would equilibrate or obtain equal relative status positions on their various status hierarchies;

(3) Three specific hierarchies are suggested as examples: economic, political, and prestige;

(4) He suggests a gross approximation would be the simple arithmetic average of an individual's status positions on the several hierarchies, while recognizing that weighting of each status position according to its importance and the types of conversion prevalent would be more fruitful; and,

(5) Lastly, he suggests major structural upheaval for a society that thwarts the equilibrating process.

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[3] Ibid.

[4] Ibid.

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CONTAINS
NUMEROUS
PAGES WITH
THE ORIGINAL
PRINTING ON
THE PAGE BEING
CROOKED.

THIS IS THE
BEST IMAGE
AVAILABLE.

The first study employing these suggestions was one done by Stuart Adams[5] of bomber crews during the Korean war. Adams used the term "status congruency" which he defined for groups and individuals respectively as follows:

'Perfect group congruency is the condition in which individuals within the group stand in exactly the same rank order in all effective status hierarchies in the group.'[6]

'Perfect individual status congruency exists when an individual's rank in one status hierarchy coincides exactly with his rank in all other significant status hierarchies.'[7]

The significant hierarchies studied by Adams were age, military rank, amount of flying time, education, reputed ability, popularity, length of service, combat time, and position importance. Interestingly enough, he does not have the problem of epistemic correlation since, by his own definition, his conceptual and empirical measures are the same.

'The individual indices were computed by first determining each individual's median rank in the nine hierarchies, then summing the absolute values of his deviations from the median rank.'[8]

Also Adams computed a group index from phi correlations between each possible pair of status hierarchies on a crew, then combining the thirty-six resulting correlations by a "Z" transformation.

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[5] Stuart Adams, "Status Congruency as a Variable in Small Group Performance." Social Forces 32 (No. 1), p. 16-22.

[6] op.cit., p. 17

[7] op.cit., p. 17-18

[8] Ibid.

Adams' definitions seem consistent with Benoit-Smullyan relative to defining an individual's status on multiple hierarchies, even though he calls this concept group or individual status congruency. He implicitly accepts the second summary point of Benoit-Smullyan that this process toward equilibration does occur and, even, should occur for the optimum operation of the group, consistent also with summary point five of Benoit-Smullyan. His selection of hierarchies, however, does seem to violate Benoit-Smullyan's intent. Whereas Benoit-Smullyan's ostensive examples of status hierarchies were all social in nature, Adams' were a combination of demographic factors; such as age[9], length of service, amount of flying time, and combat flying time; and situational attitudes, such as reputed ability and popularity. Military rank and position importance may be hierarchies of status but they are not on the same level of abstraction as education, which he does include, and the other status hierarchies mentioned by Benoit-Smullyan. Adams' lack of information concerning how individuals were placed on each hierarchy does cloud whether his use of the median in deriving individual scores was the most robust technique possible. He did introduce an interesting way to derive a group score by considering all the possible combinations of status dimensions.

Gerhard Lenski popularized the use of the multidimensional approach to social status rank assessment. In 1954 Lenski's operationalization of Benoit-Smullyan's conceptualization of status, as not "a single position in

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[9]It could be argued that these variables could be considered as status dimensions for a specific group. Age might be considered an abstract, broad in scope and inclusiveness, status dimension; but, the rest seem of a lower level of abstraction and applicable only to smaller and group specific collectivities of individuals.

a unidimensional hierarchy. . .(but as) a series of positions in a series
of related vertical hierarchies"[10], focused the attention of the discipline
to this operational definition and Lenski's mathematical method.

Lenski is consistent with Benoit-Smullyan in viewing a person's status
as a combination of relative rank positions on several dimensions. Lenski
is also consistent with the ideas of Benoit-Smullyan's summary points two
and five, concerning the universal applicability of this equilibrating pro-
cess and the dire consequences resultant if blocked or thwarted.

Lenski's hierarchies of ethnicity, income, occupation, and education
seem to be on the same level of abstraction as Benoit-Smullyan's economic,
political, and prestige. Benoit-Smullyan's discussion of his economic and
political hierarchies and their intercorrelations . . . 'we feel it possible
to maintain (without raising the question of causal priorities) that the two
(economic and political) are in essence distinct, i.e., that they refer to
two inter-connected, but not identical, types of social phenomena'[11], indi-
cates that theoretical criterion for inclusion of these highly interrelated
variables pre-empts any statistical parsimony when a composite score is
constructed. Thus, we see no inconsistency when Lenski chose the objective
dimensions of occupation, income, and education. However, Benoit-Smullyan's
discussion of his prestige hierarchy indicates his recognition of another,
not so objective, aspect to status, as follows:

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[10]Gerhard Lenski, "Status Crystallization: A Non-Vertical Dimension of
   Social Status." _American Sociological Review_ 19 (No. 4), p. 405.

[11]Benoit-Smullyan, _op.cit._, p. 156.

'Prestige status differs from economic and political status in that it cannot be wholly described in behavioristic terms. At the core of prestige is a sentiment which some individuals feel towards others, and which like any internal state can be described only by relating it to another internal states, and by designating the external behavioral context in which such a sentiment is generally experienced.'[12]

Lenski's hierarchy of ethnicity does not seem to be of the type envisioned by Benoit-Smullyan. Rather the inclusion of ethnicity may have come from a secondary discussion of criterions of social classification by Benoit-Smullyan called situs, "described as membership in a social group"[13], which is defined as an 'aggregate of persons socially distinguished by any common characteristic except status and locus. The distinguishing criterion may be biological (as in family, sex group, age group, race), physical . . . psychological . . . cultural . . . either real or imaginary.'[14] Thus Lenski does not seem to be consistent with the concept originator's idea with the inclusion of this, ethnicity, category. This is further demonstrated by Lenski's own rationale for inclusion of the four hierarchies he chose:

'For operational purposes, the statuses of respondents were defined in terms of their relative positions in four vertical hierarchies: the income hierarchy, the occupation hierarchy, the education hierarchy, and the ethnic hierarchy. These four were chosen both because of their great importance and also because of the relative ease with which necessary information relating to them could be obtained.'[15]

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[12] op.cit., p. 158.

[13] op.cit., pp. 152-153.

[14] ibid.

[15] Lenski, op.cit., p. 406.

Parenthetically, I should like to note that I have found none of the
Lenski critics who have objected to his exclusion of subjective statuses as
citing his lack of consistency with the Benoit-Smullyan conceptualization as
reason, or even as a part of the reason, for their disagreement with him.

It should also be noted, for purposes of the reader's clarification,
that Lenski himself uses various terms as synonymous, status consistency,
status crystallization, and status congruency.

When Benoit-Smullyan commented on the serious consequences possible if
the status-equilibrating process becomes thwarted or blocked in a society,
he could have been interpreted as proposing that a nation or group observe
its vertical mobility rate, both in terms of successes and in the time and
means involved. Also he spoke of the social tensions which could occur if
the process were stymied, but he did not allude to any personal, i.e., psycho-
logical, tensions. However, Lenski chooses as his definitive variable for
applying the new conceptual construct, political attitudes, particularly
political liberalism, and concludes:

> 'that the more frequently acute status inconsistencies occur
> within a population the greater would be the proportion of
> that population willing to support programs of social change.'[16]

With the foregoing statement, Lenski seems to have moved far afield
from Benoit-Smullyan. Benoit-Smullyan spoke of measuring status on a multi-
dimension basis and acknowledged that statuses on these dimensions are
frequently of different ranks, but it was not the existence of disparate

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[16]op.cit., p. 411.

ranks that he was calling attention to. Rather he spoke of forces or factors
which block or thwart the "natural"[17] process of rank equilibration on the
various statuses. It was the existence of these blocking forces and their
effectiveness that would garner the tensions in society of which he spoke.
Almost ten years later Lenski replied to critics that he did not mean to
imply or 'demonstrate that the consistency, or crystallization, variable is
a more powerful predictor of behavior than simple, consistent differences
in status . . . (but rather his) hypothesis is that inconsistencies in status
generate an interaction effect on variables that are symptomatic of stress.'[18]

Summary

The resultant Aristotelian definition of the concept, status consistency-
inconsistency is: (for the former) the equivalence of positions occupied by
an individual on each of his several vertically-ordered status dimensions,
and for the latter; the lack of equivalence of positions (one or more) occu-
pied by an individual on each of his several vertically-ordered status dimensions.

The word terms status consistency and status inconsistency serve as
the definiendums in this case. The genus within the definien is vertically-
ordered status dimensions; the differentia, or specifying characteristics,
are "equivalence" or "lack of equivalence" of positions occupied by an
individual.

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[17]Natural in the sense of always occuring or will always occur, if no
intervention.

[18]Gerhard Lenski, "Comment", Public Opinion Quarterly 28 (1964), p. 326.

The logical rules of explication to the empirical level are also basically well-established. There is concurrence in the ostensive measures of income, education, race-ethnicity, and occupation, as chosen by the two methodologists, Jackson and Lenski.

APPENDIX B

Lenski Formulations[1]

The mathematics employed by Lenski are somewhat more sophisticated
that Benoit-Smyllyan's most gross approximation suggestion and less than his
ideal.

Essentially Lenski followed the procedure below for his first attempt.

(1) Frequency intervals were established for each of the ordinal
     values assigned on each dimension (occupation, income,
     education, and ethnicity).

(2) A cumulative percentile range was constructed for each of
     the values on each dimension. The upper limit for each
     value was determined by the overall percentage of the
     total N was represented by the accumulated N through that
     value. The lower limit of the range was one-tenth of one
     point above the upper limit of the value preceding. Example:

         Value = 3 Frequency = 10   Cumulative range (from previous
                                          calculation) = 0.0 to 2.5

     To compute range for Value - 4; the lower limit of the
     range, by definition, is 2.6. The upper limits is computed
     by adding the frequency N for value 3, which is 10, to the
     frequency N for value 4, which is also 10. This sum of 20
     is divided by the overall N of 400 to derive an upper limit
     for value 4 of 5.0. Hence, value 4's range is 2.6 to 5.0.

(3) Assign a midrange value as individual score to each person
     whose value, i.e., raw score, so indicated. Example: Let
     us say from point 2 above that an individual has a raw score
     value of 4. What cumulative percentile value would Lenski
     assign. First, determine the midrange value for raw score
     value 4. The range of 2.6 to 5.0 exhibits 2.4 points. One
     half of this is 1.2, which when added to the lower limit,
     gives the individual a midrange value, in cumulative percentile
     points, of 3.8.

_____

[1]Gerhard Lenski, "Status Crystallization: A Non-Vertical Dimension of
  Social Status", American Sociological Review 19 (No. 4), p. 405.

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(4) The assigned cumulative percentiles for an individual on
each of his dimensions are summed. The mean is then
computed, and the differences of each dimension cumulative
percentile score from the mean is found. These differences
are squared and totalled across all dimensions. The square
root of this resultant total is found and subtracted from
100. The score remaining is the Lenski Crystallization Score.

Example:

Individual A:

Dimension Scores		Diffs from Mean	Diffs Squared
Education	41	-9	81
Occupation	59	9	81
Income	60	10	100
Ethnicity	40	-10	100
Total	200		362 = Sum of deviations from the mean.

Mean = 50

Square root of 362 equals approximately 19.

100 - 19 = 81 score for status crystallization of individual A.
Hence individual A is on the, or leans toward the, highly con-
sistent side of the consistency continuum. The closer an
individual's overall score to 100, according to Lenski, the more
consistent his statuses, the more highly crystallized his
status position.

Now to determine whether the individual was a member of a highly

crystallized or not highly crystallized group, Lenski devised a cutting point

system, which, in fact, took the top three quartiles of observations, i.e.,

the top 300 of 400, as highly consistent, and categorized the remainder as

low consistent. This method was quickly discarded.

The second Lenski method varies somewhat. In this procedure, steps

one, two and three are identical to the first method. The following are the

new steps for method two.

(4) Divide the cumulative percentiles for each dimension into
tertiles based on actual assigned values. Example: We
have already computed the individual cumulative percentile
scores for each individual on each dimension. Now we take
the frequency and range of these computed percentile values,
which were the midpoint values of their respective ranges,
and in terms of numbers, divide the range of values into
thirds as close as can be done without breaking up values.

Example:

Cumulative Percentiles	Frequency		Assigned Category
10	10	I	three
20	5		
30	10		
50	20	II	two
60	15		
70	20	III	one
80	20		

Note that in the example the frequency for value I would equal 25, that of value II=35, and that for value III=40. This is what is meant by dividing into tertiles as close as possible to an even break in terms of numbers, without attempting to split frequencies for given values. The determination of whether the tertile would be assigned a I, meaning high; a II, meaning middle or moderate; or a III, meaning low, is determined after examining the raw values and cosing on which the original computation of midrange percentile values was made. Thus, for example, if on the education dimension we find that the lower values, e.g., 1, indicates only 4 years of formal schooling and value 9 indicates a college degree with post-graduate work, then the cumulative percentiles of low value indicate low social status position for this education variable. Thus the value I for the low cumulative percentile ranges of 10, 20, and 30 would mean low status on education. However, to keep the assignment of I's, II's and III's consistent. We would merely determine which end of the tertile-divided dimension reflected the low category and assign it a three, as in column two of our example, the middle category a two, and the high or upper category a one. After an individual has been assigned a one, a two, or a three, on each dimension his overall profile is examined. Any individual whose ranks on each dimension are alike, i.e., 1 1 1 1 or 2 2 2 2, etc., is considered consistent. Any person who has a one rank deviation in only one of his status dimensions would be classified

as moderately consistent. All others are classified as inconsistent.

For purposes of ease of comparison, we broke the Lenski category three into comparable units as Jackson's method, see Appendix C.

It should be noted here, also, that Lenski was specific as to units of measurement. Specifically when he measured income, it was income of head of the household only, stated in terms of per annum income. Education was measured in terms of number of years of private or public formal education completed, with one exception. The highest rank, rank 1, is assigned the college end of the continuum. The lowest rank, rank 3, is assigned the no school or little formal schooling end of the continuum. The exception is that before computing an individual's cumulative percentile score for the education dimension, you divide the sample at age forty-five. People over forty-five who "attended high school 9 to 11 years without other schooling" are assigned to the next highest category of "high school graduate". Occupations were assigned ordinal values according to the National Opinion Research Center's study of occupational prestige done in 1947. This was done on this sample as well using the 1947 study as a guide. Ethnic status classification was included as part of the coding on this survey. Those of English, Old American, and Northwest European ancestry have the lowest raw score values, hence they are categorized as a one under the Lenski system 2.

Therefore, the final Lenski method results in a scale of equivalence, a nominal scale. The members of each of his subclasses, consistents, moderate consistents, and inconsistents, share the property being scaled, i.e., all like statuses, one rank deviation (not specified as to direction or degree), and all others.

APPENDIX C

Jackson's Method[1]

Jackson employed the same overall principle of recognition of multiple ranks of status held by any individual. He devised a method of arriving at a person's status profile or configuration similar to Lenski's second method with some notable differences.

First Jackson does not compute cumulative percentile positions for dimension values but rather codes an individual's status position on each dimension based on the raw value score, as below:

(1) Occupation is coded: rank 1=professional and business occupations; rank 2=clerical and skilled labor occupations; and rank 3=semi-skilled, unskilled and service occupations. The same National Opinion Research Center study was used to assign persons whose occupation was in doubt.

(2) Education is coded: rank 1=college graduate and attended college; rank 2=high school graduate with or without other non-college schoolqng; and attended high school 9-11 years with or without other schooling; rank 3=eight years of school or less. Persons under forty-five years of age and whose education category corresponded to "attended high school 9-11 years with or without other schooling" were assigned a rank of 3, comparable to Lenski.

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[1]Elton Jackson, "Status Consistency and Symptoms of Stress", American Sociological Review 27 (August, 1962), 469-480 passim.

(3) Racial and ethnic is coded: rank 1=Old English or Old American; rank=Northwestern European; and rank 3=Southeastern European, Jewish, American Indian and Negro. "Questions on the status of nationalities were settled by reference to Bogardus study of social distance."[2]

After individuals were assigned one of the three values for each of the three dimensions he used, a status profile was determined and classified accordingly:

(1) Status consistents: persons with the same rank on all three dimensions, 111, 222, or 333.

(2) Moderate inconsistents: persons with two like ranks and a deviation of one rank-step in the third dimension, 112 or 323.

Two sharply inconsistent categories:

(3) Persons with no like ranks, 123, 312.

(4) Two rank deviates: persons with two like ranks and a deviation of two status points in the third dimension, 113, 313.

It should be noted here that Jackson used only three dimensions. He omitted income since his data revealed only the total family income and not per annum income of head of household as in the Lenski example.

The result of this final classification is, again, a scale of equivalence, a nominal scale wherein each member of the subclass shares a similar characteristic, his rank deviation.

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[2]Ibid.

APPENDIX D

THE METHOD OF SELECTION OF A SAMPLE OF DWELLING
UNITS FOR THE DETROIT AREA STUDY, 1956-57[1]

I. Initial Sample Design Decision

The sample design for the 1956-57 research is a modified version of

the multi-stage area-probability sample discussed in John Takeshita's

"Selection of a Sample of Dwelling Units for the Detroit Area Study,

1954-55".[2] It is modified in the sense that: (1) the primary sampling units

are precincts instead of census tracts, and (2) these precincts were selected

by a different method, which will be described later, than were census tracts

in earlier studies.

Before we discuss the mathematical and procedural aspects of this

study, we shall consider an area of sample design that is too seldom written

up. This area comprises the set of initial decisions made by researchers

and samplers together in an effort to tailor the design of the sample to

maximize the research objectives of the researchers or sponsors of the study.

The intention of the participants of this year's study is to relate

the social and political structure and conditions of a community to such

variables as voting behavior and political participation. The first step

was to define the universe to be sampled. The sponsors chose to sample only

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[1]Detroit Area Study, Survey Research Center, University of Michigan, November
1956, Project 843, #1176.

[2]Ann Arbor: University of Michigan Press; 1955.

Wayne County. Second, it was decided on the basis of cost and time available that we could take roughly 600 interviews from the general adult population of Wayne County. Third, the question of what to use as a primary sampling unit arose. The precinct was subsequently selected as the community unit best suited to the purposes of this study. It combines the desirable characteristics of having a unit political organization and at the same time being small enough to decrease the likelihood of containing numerous heterogeneous subcommunities.

The method of selecting this primary sampling unit (p.s.u.) differs from the usual method of selecting census tracts. Ordinarily the selection of p.s.u.'s is an integral part of the three-stage selection of dwelling units (d.u.'s), i.e., the overall probability for selecting d.u.'s (P_i) is a product of the probabilities of selecting given p.s.u.'s, blocks within the p.s.u.'s, and d.u.'s within the blocks: $P_{p.s.u.} \times P_b \times P_{d.u.} = P_c$. In 1956-57 we decided to select between 80 and 90 precincts previous to the application of the above formula and then to apply the formula to calculate the sampling intervals for blocks and dwelling units.

To insure that a sufficient number of precincts for analysis purposes would be selected from each congressional district in Wayne County, a decision was made to use the techniques of "incidental" stratification based on these districts. Also, for analysis purposes, it was deemed important to type the precincts by certain social characteristics and to stratify on this basis. Initially a six-cell stratification was desired. Whether the precincts were traditionally Republican, Democratic or Mixed was to be broken against whether they were ethnically homogeneous or heterogeneous. Since it

was essential to have a sufficient number of cases in each cell to permit
analysis, a pilot study of a rough sample of 500 precincts was undertaken.
The results of that study are shown on the next page.

	Political Preference		
Ethnic Composition	Rep.	Mixed	Dem.
Heterogeneous	(A) 1/7	(B) 1/7	(C) 4/7
Homogeneous	(F) 0	(E) 0	(D) 1/7

Virtually no precincts of types E and F existed and they were ruled
out of the analysis. Enough decisions had now been made to enable us to
select a systematic sample of 142 precincts. Of these, 100 were Democratic.
These precincts were typed according to whether they exhibited homogeneous
or heterogeneous ethnicity. It was decided to subsample the Democratic
heterogeneous precincts at one-fourth of the precinct sampling rate while
all of the Republican heterogeneous and the Democratic homogeneous precincts,
24 Mixed, 24 heterogeneous Democratic, and 21 homogeneous Democratic pre-
cincts were selected.

The one-fourth sampling rate for type C precincts was now a problem
for the decision-maker. If we maintained the one-fourth sampling rate for
type C precincts when we selected blocks and d.u.'s, we would obtain 600 inter-
views that would actually be equivalent to about 387 interviews taken pro-
portionately. If, however, our overall sampling rate for type C precincts

were raised to one-half, our 600 interviews would be "worth" 540 interviews.
To obtain a one-half overall sampling rate for type C precincts after having
selected these precincts at the one-fourth rate, we decided to select twice
as many d.u.'s in these precincts as in type A, B, and D precincts.

It may be mentioned at this point that the 1956-57 study also involved
interviewing in Macomb and Oakland Counties. The sample in these areas was
selected as described in the Takeshita article. The interviews were short,
census data type, and were collected to provide continuity with the previous
research of the Detroit Area Study.

II. The Mathematical Foundation of the Sample.

A. Determination of the overall sampling rate.

The overall sampling rate is obtained by dividing the number of d.u.'s
in the sample by the number of d.u.'s in the universe. Three steps are
necessary to obtain the number of d.u.'s in the sample:

(1) We estimate that the "block listing" of the blocks selected
in the sample will be .97 accurate. (Block listing involves going to the
selected block and listing every d.u. in that block. The final sample of
d.u.'s is selected from this list). We know that not every dwelling in the
sample will yield an interview. It is estimated that our response rate will
be .85. The estimated accuracy of block listing (.97) is multiplied by the
expected response rate (.85). The product (.82) is the estimated overall
coverage.

(2) Since our goal is 600 interviews as follows:

$$\frac{\text{Type A,B,D precincts}}{400 \text{ (full rate)}} \neq \frac{\text{Type C precincts}}{200 \text{ (1/2 rate)}} = 600, \text{ we must}$$

double the type C total if we are to estimate the _full_ sampling rate.
400 (full rate) ≠ 400 (full rate) = 800.

(3) This figure (800) must now be divided by our estimated overall coverage so that we can take the listing and interviewing less into account.

$$\frac{800}{.82} = 975 = \text{number of d.u.'s in sample.}$$

The number of d.u.'s in the universe is based upon estimates of the Detroit Edison Co. which uses building permits issued to construct its figure.

$$
\begin{array}{llr}
\text{number of d.u.'s} & 7/55 \dots \dots \dots \dots & 768,000 \\
\text{"} \quad \text{"} \quad \text{"} & 7/54 \dots \dots \dots \dots & \underline{749,000} \\
\text{difference} & & 19,000
\end{array}
$$

We assumed that building continued at approximately the same rate during the period 7/55 - 7/56 and that as of October 1, 1956 there are approximately 792,000 d.u.'s in Wayne County. Therefore:

$$\text{the overall sampling rate} \quad \frac{975}{792,000} \quad \frac{1}{812}$$

B. Determination of the within-precinct sampling rates.

The within-precinct sampling rate for precincts of types A, B, and D is discussed first. It will be remembered that these precincts are to be sampled at the full rate. Originally a precinct was selected for every 8428.83 registered voters in Wayne County. The probability of selecting the ith precinct becomes $\frac{P_i}{8428.83}$ where P_i equals the number of registered voters as of July, 1956 in the ith precinct.

The within-precinct sampling interval, therefore, becomes:

$$\frac{P_i}{8428.83} \quad X \quad \frac{8428.83}{812 \text{ X } P_i} \quad = \quad \frac{1}{812}$$

er:$$\quad \frac{P_i}{8428.83} \quad X \quad \frac{10.38}{P_i} \quad = \quad \frac{1}{812}$$

At this point we proceeded somewhat differently from the method des-
cribed in the Takashita paper. We decided to select two blocks and no more
in each sample precinct. This was accomplished by writing our block selection

probability as: $\dfrac{B_{ij}}{\frac{\Sigma B_{ij}}{2}}$ where B_{ij} equals the estimated size of the sample

block. Our within-precinct sampling probabilities become, therefore:

$$\frac{B_{ij}}{\frac{\Sigma B_{ij}}{2}} \times \left(\frac{10.38}{P_i} \times \frac{\frac{\Sigma B_{ij}}{2}}{B_{ij}} \right) = \frac{10.38}{P_i} \quad \text{where} \quad \left(\frac{10.38}{P_i} \times \frac{\frac{\Sigma B_{ij}}{2}}{B_{ij}} \right)$$

is the d.u. probability of selection.

The probabilities that are used at every stage of selection for A, B,
and D type precincts can now be written as:

$$\frac{P_i}{8428.83} \times \frac{B_{ij}}{\frac{\Sigma B_{ij}}{2}} \times \left(10.38 \times \frac{\frac{\Sigma B_{ij}}{2}}{B_{ij}} \right) = \frac{1}{812}$$

The within-precinct sampling rate for type C precincts, of course,
differs somewhat from the above. It will be remembered that these precincts
are to be sampled at one-half of the full rate; the overall sampling rate
for this stratum is, therefore, $\frac{1}{1624}$. The probability of selecting the ith
precinct is: $\dfrac{P_i}{4 \times 8428.83}$. The factor 4 is introduced because we intend to
select only 1/4 as many precincts of this type.

In order to raise the sampling rate back to one-half of the full rate
after having selected the precincts at the one-quarter rate, we must select
twice as many blocks in type C precincts. Our block selection probability

This application of an interval rather than <u>random selection</u> gives this selection method the name <u>systematic</u>.

The results of our first selection were as follows:

Stratum	I	II	III
Republican precincts	2	7	9
Mixed "	2	7	15
Democratic "	30	33	37

The democratic precincts, as we mentioned earlier, were then reclassified according to whether they were ethnically homogeneous or heterogeneous. All homogeneous precincts were automatically included in the sample while all heterogeneous precincts were subsampled at the one-fourth rate to give us the type C stratum of precincts.

The use of precinct voter registrations as a reliable measure of size requires our careful scrutiny. If we plan to obtain 6 interviews per precinct, we can expect that our standard deviation from this figure will be $\neq$ 1.5 due to non-response and to error in our block estimates of size. Our coefficient of variation will be, therefore, c. v. = $\frac{1.5}{6}$ = 0.25.

Let us assume that the mean registration per precinct is 60%. If the standard deviation from this figure is $\neq$ 6%, then our c.v. will be increased by only 0.02 to 0.27. If the standard deviation were as much as $\neq$ 12%, our c.v. will still increase only to 0.32. While the latter estimate is quite pessimistic, the increase in the coefficient of variation still is not sufficiently large to warrant obtaining more accurate but also far more costly measures of size.

The total registration per precinct was obtained from the Wayne County Elections Commission office in Detroit. We found that this office adheres

seriously to its statutory task of adjusting precinct boundaries whenever precinct registrations exceed 600 persons. For areas outside of the city proper, however, registrations frequently are allowed to exceed 1000 voters per precinct.

B. The selection of sample blocks.

The second stage of a multi-stage sample is to assign measures of size to blocks within the sample precincts in order that we may select the sample blocks. A variety of methods were employed to obtain these estimates.

Within the city of Detroit itself we used City Plan Commission maps upon which the blocks were drawn and all d.u.'s located. These maps, while extremely useful, were made in 1949, and, therefore, were somewhat inaccurate. The block size indicated on the map was noted and then corrected after reference was made to building permits issued over the last six years for the blocks within the sample precincts. A final correction for the existence of multiple d.u.'s was made either by the use of the city directory or by a field check.

Outside of the city our problem was much more complex. No maps of the City Plan Commission variety existed for this area except in the office of the Wayne County Tax Assessor. While very helpful, these maps were not always the answer to our problems. Since the suburban area is the one of most rapid growth, even a one year lapse in the records is too large to tolerate. However, we did make use of these maps for the more thickly settled areas to obtain our block estimates. For the remaining precincts we felt that a field check was the only reliable method. This procedure, commonly called "chunking", is to go directly to the sample precincts and count the number of d.u.'s in each block.

Once block estimates are made, the sample blocks are selected, using the formula $\dfrac{\frac{\Sigma B ij}{2}}{B ij} = k$ for type A, B, and D precincts, or the formula

$\dfrac{\frac{\Sigma B ij}{4}}{B ij} = k_1$, for type C precincts. The blocks are numbered in serpentine

fashion and cumulated in that order. A random start (RS) equal to or less

than k (or k_1) is determined and the block selection is made as follows:

R.S., R.S.≠k, R.S.≠2k, ...R.S.≠nk.

The block whose cumulative number contains one of the above numbers

is selected.

C. The selection of the sample dwelling units.

We should have, by the above methods, selected 174 sample blocks. Field

teams will go to each of these sample blocks and list every dwelling unit in

these blocks by a prescribed conventional method. From these lists the

sample d.u.'s are selected. In order that we may account for errors in our

block estimates, we use our original block estimates in arriving at our

within-block sampling interval. For instance, for blocks in precincts of

type A, B, and D this interval is $\dfrac{\frac{\Sigma B ij}{2}}{B ij \times P_i} \times 10.38$.

Suppose, for example, that for a given sample block our estimate is

Bij=10 d.u.'s. Block listing reveals that there are actually 20 d.u.'s on

the block. Since we will use Bij=10 to calculate our d.u. sampling interval,

this interval will be twice as small as it "should" be. As a result we will

select twice as many d.u.'s as we would have, had we had a correct estimate.

In this manner, we can account for errors in our block estimates and maintain

our "equal probability" requirement.

APPENDIX E

Survey Questions Included[1]

1. Respondent Number (a 3 position field)

2. Race: 1 = White
            2 = Negro
            3 = Other

3. Sex: 1 = Male
            2 = Female

4. Age: 0 = 21-24
            1 = 25-29
            2 = 30-34
            3 = 35-39
            4 = 40-44
            5 = 45-49
            6 = 50-54
            7 = 55-59
            8 = 60-64
            9 = 65 and over
            -   Not ascertained

5. Relationship to "Head of Household":
            1 = Head of Household
            2 = Wife

6. Marital Status:
            1 = Married
            2 = Single
            3 = Divorced
            4 = Separated
            5 = Widowed
            - = Not ascertained

---

[1] Items were selected from the 1956-1957 Detroit Area Study, collected by the Survey Research Center, University of Michigan, Code 1957, Project 843, Eldersveld's Cross-section Survey of Political Participation.

7. What was the highest grade of school you completed?

       0 = None, or less than one year

       Elementary School
       1 = one to four years
       2 = five or six years
       3 = seven years
       4 = eight years

       High School
       5 = nine to eleven years or some high school, not
          ascertained how much
       6 = completed high school

       College
       7 = one to three years of college or some college,
          not ascertained how much
       8 = completed college
       9 = graduate work in college

       - = not ascertained

8. Do you have a religious preference?
   What is your religious preference?
   What religious denomination is that?

       11 = Roman Catholic

       21 = Greek Orthrodox
       22 = Greek Rite Catholic
       23 = Russian Orthrodox
       24 = Roumanian Orthrodox
       25 = Serbian Orthrodox
       2- = Other Catholic or other Orthrodox

       31 = Jewish

       35 = Mohammedan

       Protestant

       41 = Protestant, but no denomination given
       42 = Protestant missionary
       43 = Church of God and Christ

       Reformation Protestant

       51 = Presbyterian
       52 = Lutheran
       53 = Congregationalist
       54 = Plymouth Brethern
       55 = United Brethern or Evangelical United Brethern

Pietistic Protestant

61 = Methodist
62 = Baptist or Primitive Baptist
63 = Evangelical and Reformed
64 = Reformed or Dutch Reformed

Neo-Fundamentalist Protestant

71 = United Missionary or Missionary
72 = Church of God
73 = Nazarene
74 = Christian Church
75 = Jehovah's Witnesses
76 = Penecostal
77 = Sanctified
78 = Church of Christ
79 = Disciples of Christ
70 = Seventh Day Adventist
7- = Neo-fundamentalist-general

Other Protestant

81 = Christian Scientist
82 = Spiritualist
83 = Latter Day Saints, Mormon
84 = Unitarian
85 = Salvation Army
8- = Other Protestant

91 = Episcopalian, Anglican, Church of England

99 = Preference other than any of the above
&& = Has no preference
-- = Not ascertained

9. What is your occupation?
   What kind of business is that in?
   Do you work for yourself or someone else?

   Usual Occupation of Ego:
   Professional, Technical and Kindred Workers
   01 = Accountants and auditors
   02 = Undertaker
   03 = Dentists
   04 = Engineers
   05 = Lawyers and judges
   06 = Clergyman
   07 = Physicians and surgeons

08 = Nurse
09 = Teachers
0& = Other professional, technical and kindred workers

11 = Farmer

Managers, Officials and Proprietors
21 = Self-employed business man, owner or part owner,
     "small" business, earned less than $10,000 in 1956

22 = Self-employed business man, owner or part owner,
     "large" business, earned more than $10,000 in 1956

29 = Manager or official
2- = Self-employed, size of business not ascertained

Clerical and Kindred Workers
31 = Bookkeepers
32 = Receptionist
39 = Other clerical and kindred workers

Sales Workers
49 = Sales Workers

Craftsmen, Foremen and Kindred Workers
51 = Self-employed artisans and craftsmen
52 = Foremen
58 = Armed services
59 = Craftsmen and kindred workers

Operatives and Kindred Workers
61 = Truckdrivers, taxicab drivers, chauffeurs, bus drivers
69 = Operatives and kindred workers

Private Household and Service Workers
71 = Firemen
72 = Policemen
73 = Other protective service workers
78 = Practical nurse, nurse's aide
79 = Other practical household and service workers

Laborers
81 = Farm laborers

91 = Laborers

&& = Not in labor force - (housewives)
-- = Not ascertained

10. How much of your total family income was the income of the head of the family?

> Income of Family Head
>
> 0 = Less than $1000
> 1 = $1000 - 1999
> 2 = $2000 - 2999
> 3 = $3000 - 3999
> 4 = $4000 - 4999
> 5 = $5000 - 5999
> 6 - $6000 - 6999
> 7 = $7000 - 7999
> 8 = $8000 - 9999
> 9 = $10,000 - 14,999
> & = $15,000 and more
> - = Not ascertained, did not know, or refused to give income information

11. What is the original nationality of your family on your father's side?

> Northwest Europe
>
> 11 = English
> 12 = Scotch
> 13 = Irish
> 14 = French
> 15 = Any other single Northwest nationality: Norwegian, Swedish, Danish, Dutch, Belgian, Swiss, Icelandic
> 16 = Any mixture of Northwest European--other than shown in 17
> 17 = Welsh, or any mixture of English, Scotch, Irish, or Welsh
>
> Central Europe
>
> 21 = German
> 22 = Polish
> 25 = Any other single Central European country: Czechoslovakian, Austrian, Hungarian, Slav, Croat, Yugoslavian, Albanian
> 26 = Any mixture of Central European countries.
>
> Eastern Europe
>
> 35 = Any single Eastern European, Russian, Latvian, Estonian, Lithuanian, Finnish, Roumanian, Bulgarian, Armenian, Turkish, Syrian, Lebanese
>
> Southern Europe
>
> 41 = Italian
> 45 = Any single other Southern European nationality: Greek, Spanish, Portugese
> 46 = Any mixture of South European

Other
51 = Canadian
52 = French Canadian
61 = Any mixture of nationalities not coded as 16, 26, 36, or 46
71 = Any single nationality not listed in code
88 = Negro
-- = Not ascertained

12. How do you feel about the statement, "The government ought to help people get doctors and hospital care at low cost." Do you think the government should do this or not, or don't you have an opinion on this?

    1 = Agree strongly
    2 = Agree
    3 = Not sure
    4 = Disagree
    5 = Disagree strongly
    9 = No opinion or don't know
    - = Not ascertained

13. How about this statement: "The United States should give help to foreign countries even if they are not as much against communism as we are." Do you think the government should do this or not, or don't you have an opinion?

    1 = Agree strongly
    2 = Agree
    3 = Not sure
    4 = Disagree
    5 = Disagree strongly
    9 = No opinion or don't know
    - = Not ascertained

14. How about this: "The government in Washington should stay out of the question of whether white and colored children go to the same school." Do you think the government should do this or not, or don't you have an opinion on this?

    1 = Agree strongly[2]
    2 = Agree
    3 = Not sure
    4 = Disagree
    5 = Disagree strongly
    9 = No opinion or don't know
    - = Not ascertained

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[2]Scoring on this question was reversed so that a low overall point score on questions 12, 13, and 14 would indicate a "liberal" position.

APPENDIX F

Statistical Formulae Utilized

Chi Square, a non-parametric statistic, was chosen so we could focus on the differences in frequencies of like categories.

To test the hypotheses concerning the numbers of people identified by each of the consistency categories according to either the Lenski or the Jackson formulation, we will use the Chi Square test to determine whether or not these two methods may be considered to be independent or one another. The formula for each cell of the multinomial chi square is: $\frac{(Y_{ij}-E_{ij})^2}{E_{ij}}$; there are a total of r(row) X c(column) contributions, and the calculated Chi-square is their sum: $X^2_{ij} = \frac{(Y_{ij} - E_{ij})^2}{E_{ij}}$

where, Y_{ij} is the observed value for a cell in row i and column j and E_{ij} is the expected cell value for the comparable row i and column j cell. We also note that if "no more than 1/5 of the expected frequencies are less than 5, then an expected frequency as low as 1 is allowable."[1] We shall examine each contingency table according to this criteria.

Since we are concerned with the correlation between the two methods as this relates to convergent validity, we also shall use the Contingency Coefficient: C, for nominal data.

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[1] W. G. Cochran, "Some Methods for Strengthening the Common X^2 Tests." Biometrics, Volume 10 (1954), pp 417-451.

'The contingency coefficient C is a measure of the extent of association or relation between two sets of attributes. It is uniquely useful when we have only categorical (nominal scale) information about one or both sets of these attributes.....it is not necessary that we be able to assume underlying continuity for the various categories used to measure either or both sets of attributes....The contingency coefficient, as computed from a contingency table, will have the same value regardless of how the categories are arranged in the rows and columns.' [2]

The formula for the computation of the contingency coefficient is as follows:[3]

$$C = \sqrt{\frac{x^2}{N + x^2}}$$

Level of Significance: The level of significance reported will be at .05. Point-oh-five was selected for two reasons: first, behavioral scientists have consensually agreed to report findings based on statistical significance at this level as indicated by their journals; and secondly, raising the level of significance to .01 or even .001 increases your probability of committing a Type II error, accepting the null hypothesis when it is false. This occurs because we may specify the probability of the Type I category, rejecting a hypothesis which is true, but a Type II error depends on the unknown value of the parameter involved. Thus we seek a critical region which will minimize, i.e., have the smallest probability of resulting in a Type II error, while retaining an alpha, Type I critical region, sufficiently high so as to make the statistical test of the parameter meaningful.

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[2] Sidney Siegel, Nonparametric Statistics. (New York: McGraw-Hill Co., 1956), p. 196.

[3] Ibid.

APPENDIX G

CORRELATION MATRIX: RAW VARIABLES, PERCENTILE CODED VARIABLES,
CRYSTALLIZATION SCORES, AND ATTITUDE (DEPENDENT VARIABLE) SUM SCORES

		V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
V1	Education	1.000	-.136	.382	-.286	.973	-.478	.423	-.289	-.088	-.074
V2	Occupation		1.000	-.173	.087	-.147	.307	-.164	.089	.162	-.045
V3	Income			1.000	-.342	.390	-.476	.991	-.273	.076	-.033
V4	Race-Ethnicity				1.000	-.281	.202	-.351	.844	-.240	.174
V5	Education-Lenski					1.000	-.502	.434	-.287	-.100	-.112
V6	Occupation-Lenski						1.000	-.512	.151	.038	-.032
V7	Income-Lenski							1.000	-.244	.041	-.047
V8	Race-Ethnicity-Lenski								1.000	-.017	.164
V9	Crystallization Score									1.000	-.034
V10	Attitude Sum Score Dependent Variable										1.000

V1 through V4 are raw observed values for each of the variables coded according to Lenski.

V5 through V8 are the coded by computing cumulative percentiles for the same raw score variable values, according to the Lenski formulation (See Appendix B).

V9 is the sum general rank consistency score for individuals derived by Lenski formulation, an agreement index (See Appendix B).

V10 is the sum score of the dependent variable, political liberalism, recorded as sums of the actual observed values.

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AN APPLICATION OF CONSTRUCT VALIDATION

by

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B.S., University of Kansas, 1956

AN ABSTRACT OF A MASTER'S THESIS

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MASTER OF ARTS

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ABSTRACT

This thesis examines the application of the rules of construct valida-
tion to a sociological concept, status consistency-inconsistency. This
application is referred to as explication, wherein the verbal or usage
ambiguities of a construct are reduced and its precision as an indicator of
some real world phenomenon is enhanced.

The methods of measurement of this concept employed by Gerhard Lenski
and Elton Jackson were compared for further evidence of convergent validity,
the degree to which independent measures identified the same concept.

The results of our application of construct validation rules to this
concept indicated that:

    (1)   This concept had never been validated and could not be if
            one used the research design employed by the concept's
            first operationalization by G. Lenski;

    (2)   The concept is, at best, a heterogeneous construct which
            means less rigorous statistical methods than those currently
            employed must be used; and,

    (3)   The Lenski and Jackson methods of measurement of this concept
            result in two different groups of individuals being identi-
            fied by status consistency type.

The results cast doubts on the interpretations of empirical research
done which has used this concept and either measurement method.