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STATUS CHARACTERISTICS & SOCIAL INTERACTION: AN ASSESSMENT OF THEORETICAL VARIANTS[*]

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ABSTRACT

This Working Paper examines a body of research addressed to critical issues in the field of status characteristics and social interaction. The main objective is to assess the extent to which various findings reported in the literature are compatible with a formalized theory presented by Berger _et_ _al_. (1977), and with _variants_ of that theory. An initial and unexpected discovery is that some widely cited results reported by Freese and Cohen (1973), long believed to contradict the "combining" assumption of the Berger _et_ _al_. model, are in fact very well described by that model -- and thus by its defining assumptions. A body of research guided by relatively recent theoretical extensions of the Freese-Cohen work is then examined; and it is found that this research is at least as compatible with the Berger _et_ _al_. model as with the alternative (variant) models. These conclusions, in some cases, contradict the conclusions of the original authors. The methodological bases of the conflicting assessments of evidence are examined in detail. Everything considered, there can be little doubt that the Berger _et_ _al_. version of the theory of status characteristics and social interaction rates higher than its alternatives on empirical adequacy, and that it also is superior on such criteria as scope and fruitfulness.

INTRODUCTION

The purpose of this Working Paper is to provide a detailed account of my efforts to assess variants of the theory of status characteristics and social interaction. Among researchers in this field of sociology, there exist differences of opinion on the worth of certain early and contemporary works, and these differences of opinion are by no means random. They are most clearly understood, I think, as consequences of what Wagner and Berger called theoretical variation (1985, pp. 721-22). What is meant by this? Suppose that some theory -- call it T1 -- is generally accepted by the members of a research community. T1 is regarded as very promising, but it is also quite limited in scope. As work continues and the validity of T1 becomes well established, an extension having greater scope is proposed and wins adherents. But these adherents do not include the entire community. An alternative extension, more appealing to the remainder, is proposed within essentially the same time frame. So then there exist two "extended theories," $T2_A$ and $T2_B$, which share basic concepts and assumptions due to their common ancestry in T1, but which nonetheless differ in important respects.

What is likely to be the impact of this division upon the cumulative development of the field? We can imagine alternative scenarios. Perhaps the competition between the proponents of $T2_A$

and $T2_B$ generates a flurry of research activity, which culminates in a resolution of the points at issue. In this case, $T2_A$ and $T2_B$ would no doubt continue to have their staunch supporters; but the field as a whole would tend in the direction of a more unified theory. Alternatively, perhaps each group simply goes its own way. In this latter case, further extensions of $T2_A$ and $T2_B$ would almost certainly follow, and the issues separating the two groups would almost certainly become increasingly convoluted and obscure.

To say that the second scenario describes the last decade of status characteristics research would be an exaggeration; yet even the most casual perusal of the literature suggests the need for researchers in this field to resolve certain basic issues. As things now stand, even the most brilliant theoretical achievement would be rejected by some portion of the community, because it would be seen as built upon discredited premises. The objective of this paper, then, is to contribute towards a resolution of disagreements that divided the status characteristics research community fifteen years ago, and that continue to divide it today.

STATUS CHARACTERISTICS THEORY

The Common Ground

The theory of status characteristics and social interaction was proposed by Joseph Berger, Bernard P. Cohen, and Morris Zelditch, Jr. (1966, 1972). The theory posits that the actors in a social situation attend to one anothers' attributes, form cognitive expectations for themselves and others on the basis of those attributes, and conduct themselves as guided by their cognitive expectations. These processes do not ordinarily occur at a high level of awareness, and very seldom involve deliberate calculation. As the members of a group act and react to each other, new features of the group itself emerge. In situations that are primarily task-focused, one of these emergent features is a power-and-prestige order, which, once formed, serves to condition subsequent interactions (Bales 1953; Berger 1958; Berger and Conner 1969; Skvoretz 1981).

The culturally defined characteristics of individuals often -- though not always -- correspond to the strata of the society of which those individuals are members. Status characteristics theory clearly has linkages to the study of social stratification, particularly to approaches that recognize the multidimensional nature of social stratification (see, for instance, Weber 1922; Benoit-Smullyan 1944; Hughes 1945; Lenski 1954; Zelditch and Anderson 1966; Geschwender 1967).

Two operative assumptions distinguish the status characteristics perspective from most other social interactionist perspectives: (1) the metatheoretical premise that such processes exhibit statistical regularities describable by formal sets of hypotheses; and (2) the substantive premise that a person's perceptions and actions are mediated by cognitive expectation states having a distinctive structure (cf. Berger *et* al. 1985). Individuals´ perceptions (conscious or otherwise) guide their behaviors; their behaviors in turn feed back upon their perceptions. Mediating these reciprocal dependencies are processes amenable to scientific study. Such processes are usually analyzed in terms of the formation of expectation states, the central concept of all variants of the theory.

The Differences

As suggested above, all status characteristics researchers trace the roots of their work to the original version of the theory, described above (Berger, Cohen, and Zelditch 1966, 1972). While this first version was rigorously developed, it was quite limited in scope, applying only to a single pair of interacting individuals differentiated by a single status characteristic (Air Force rank, age, or the like). A further limitation was that, while the theory could generate testable hypotheses, these took the form of rank-order predictions, as opposed to specific numerical (metric) predictions. Because of its very limited scope, the theory´s earliest tests were almost always laboratory experiments, where information and its communication could be carefully controlled.

Evidence supporting this earliest version of the theory quickly accumulated. Soon additional, more complicated questions became feasible to investigate. Extensions of the original theory were proposed to answer the new questions. Most notable were an extension by Freese and Cohen (1973), and one by Berger and Fisek (1974). Both generalized the theory to two actors differentiated by *one or more* status characteristics. The most novel feature of each extension was its conception of how *status inconsistency* is resolved. (How the two conceptions differ will be described below.) Although the hypotheses entailed by the respective theoretical variants clearly were at odds with one another, both extensions received what their adherents took to be empirical confirmation, which often was interpreted as *dis*confirmation of the other variant.

A third extension was proposed a few years later. This subsequent version, which set forth a provocative array of new ideas, was reported in a book by Joseph Berger, M. Hamit Fisek, Robert Z. Norman, and Morris Zelditch, Jr., published in 1977. (For ease of expression, this version hereafter will be referred to as the BFNZ formulation). In this extension, it became possible to study social situations involving multiple actors, each with multiple status characteristics, and to generate precise (parametric) predictions about certain aspects of behavior. In terms of scope, mathematical elegance, parsimony, and potential fruitfulness, this newest formulation was a quantum improvement over its predecessors.

Finally, in the thirteen years since the BFNZ formulation was published, there have appeared numerous papers that propose additional formulations, and/or that report empirical research designed to test such formulations. As the primary point of departure, the BFNZ formulation has played a central part in these investigations. The confirmation/disconfirmation standing of the latter is thus of considerable importance; but it seems to be in some doubt.

The earliest tests of the BFNZ formulation provided encouraging support for its essential correctness (see Webster and Driskell 1978; Fox and Moore 1979; Zelditch _et_ _al_. 1980). Much of the subsequent research, however, has been less encouraging (see Martin and Sell 1980 1985; Hembroff _et_ _al_. 1981; Hembroff 1982; Greenstein and Knottnerus 1980; and Knottnerus and Greenstein 1981). Berger (1988) cited these latter investigations and applauded their efforts to clarify important theoretical issues. But he added: "Not all of these studies report results that are in full accord with the [BFNZ formulation], and an overall assessment of [this body of] theory-testing research is a worthwhile task for the future" (1988, p. 456).

What is striking about findings concerning the BFNZ formulation, both those that support it and those that question its value, is the extent to which they are patterned by the _theoretical_ _variant_ to which the authors reporting those findings subscribe. Almost without exception, the _critical_ _studies_ have roots in the Freese-Cohen variant (especially as elaborated by Freese 1974, 1976); the supportive studies have roots in the Berger-Fisek variant.[1] While the ostensible focus has been upon the BFNZ formulation and alternatives to it, I have become increasingly convinced that the issues of real concern are long unresolved issues that antedate the BFNZ formulation.

Interpretations of Freese and Cohen's (1973) results appear to be at the root of many of the disagreements among status characteristics researchers. It therefore seems appropriate to begin my investigation with a more detailed examination of these important results.

THE FREESE AND COHEN STUDY

The research by Freese and Cohen (1973) demonstrated in a laboratory setting that the interaction disabilities associated with low ascribed status can be largely eliminated under certain specified conditions, a conclusion whose importance for efforts to ameliorate racial, sexual, and age discrimination would be difficult to overstate. A related study by Cohen and Roper (1972), carried out in an applied setting, addressed the same problem and obtained essentially the same results. Taken together, these two studies constitute a significant advance in sociological knowledge. This contribution is not at issue. The question I wish to address is: Do Freese and Cohen's results demonstrate a fundamental inadequacy in the BFNZ formulation?

In the analysis carried out by Freese and Cohen, the dependent variable was a measure of power-and-prestige behavior denoted P(S), which stands for the probability of a stay-response, operationalized as the proportion of stay-responses in a set of trials. A stay-response is a response in which the focal actor resists an influence attempt by a second actor, rather than being influenced.

The situation in which these responses take place is abstractly defined by the following assumptions: (1) two actors, p and o, are working together on a task, both motivated to seek a successful outcome; and (2) both actors consider it legitimate and necessary to take each other´s judgments into account.

In terms of the BFNZ formulation, P(S) is a function of the focal actor´s "expectation advantage" over the other actor. (By convention, p is the focal actor and o is the other person.) The BFNZ treatise uses the notation, $e_p - e_o$, to denote the focal actor´s expectation advantage. The function proposed is: $P(S) = m + q\ (e_p - e_o)$. In this expression, m and q are parameters to be estimated from the research data. An actor´s expectation advantage, which may be positive or negative (that is, it may be an advantage or a disadvantage), is calculated from a study´s <u>independent</u> <u>variables</u> in accordance with the set of hypotheses that constitutes the heart of the BFNZ treatise. Illustrative calculations are provided in Appendix A of this paper.

In the Freese-Cohen study, the <u>independent</u> <u>variables</u> were: (1) a diffuse status characteristic; and (2) a pair of consistently assigned specific status characteristics. Detailed discussions of the these variables and their manipulation in the research are given by the authors (Freese and Cohen 1973, pp. 186-90). In the presentations to follow, I shall identify experimental conditions by ordered pairs of parenthesized indications of p´s and o´s <u>relative</u> status on the independent variables. For instance, (H-L)(LL-HH) describes the experimental condition in which p has high diffuse status, o low diffuse status -- the (H-L) portion -- <u>and</u> in which p has low status on the two specific characteristics, o having high status -- the (LL-HH) portion.

I have fitted the BFNZ model to Freese and Cohen´s data.[2] The results are summarized in Table 1.[3]

Table 1 about here

As Table 1 shows, the correspondence between the observed and predicted P(S) values is exceptionally close. A chi-squared goodness-of-fit test, which assesses the discrepancies between the observed and predicted values, yields a computed value of 1.217. For a chi-squared test with four degrees of freedom, a computed value of at least 9.488 is required to reject the model at the .05 level of significance. In this case, the observed and predicted values are very close for each experimental condition.[3]

Those who have concluded that Freese and Cohen´s data are inconsistent with the BFNZ formulation have based that conclusion on a comparison of the observed P(S) values of Conditions 3 and 6, and a comparison of those of Conditions 4 and 5. To be sure, the pairs of observed P(S) values, in both comparisons, are very close. This has suggested to some analysts that the subjects in the "status inconsistency" conditions (those in which the cognitive expectations that would derive from status alone conflict with those that would derive from ability alone) <u>ignored</u>

the diffuse status characteristic. More abstractly, the claim is that the subjects employed a "balancing" principle, a mode of information processing in which the focal actor eliminates cognitive inconsistency (or cognitive imbalance) by disregarding information that does not fit in with the predominant pattern. As noted above, the BFNZ formulation posits a "combining" principle, a mode of information processing in which the focal actor aggregates all status and performance information in accordance with postulates of the theory (see Berger _et_ _al_. 1977, Chapter 4).

It is instructive to fit and test an explicit model that has the balancing assumption built into it. Constructing such a model is straightforward. This involves nothing more than eliminationg links from the model that correspond to the elements purportedly eliminated by the focal actor, in accordance with criteria explicated by Freese and Cohen (1973, pp. 181-86). The most pertinent results are summarized in Table 2.

Table 2 about here

Consistent with Freese and Cohen´s conclusions, a balancing model _does_ fit the data (X^2 = 4.615, df = 4, P = .3291). We cannot reject the balancing hypothesis on the basis of these data; but considering these results together with those of Table 1, it is clear that the Freese-Cohen data do not provide a strong basis for choosing between the "combining" and "balancing" hypotheses. This observation in no way reduces _substantive_ importance of this research, which, in my estimation, is considerable. The point is simply that the Freese and Cohen study does not demonstrate the superiority of either a combining or a balancing assumption. Its results are consistent with either. Contrary to numerous statements in the literature, its results are very consistent with the implications of the BFNZ formulation.

While Freese and Cohen's research cannot resolve the question of whether people "balance" or "combine" status information, the issue nonetheless does seem resolvable. It is one of two outstanding concerns about which the existing evidence would seem to warrant rather firm conclusions. I shall now address these two problems, both of which involve the salience or non-salience of social information under specifiable conditions.

TWO PERSISTENT ISSUES: WHERE DO WE STAND?

Combining vs. Balancing

Suppose p is high on characteristic C_1 and low on characteristic C_2, whereas o is low on C_1 and high on C_2. Does this status inconsistency produce cognitive dissonance for p and o? And if so, how is that dissonance resolved as p and o strive to form cognitive expectations for themselves and each other?

Status inconsistency can be given an asymmetrical character by assuming a third characteristic C_3 that reinforces C_1. Other elaborations are possible as well. Whatever the precise configuration, the essential theoretical question is: How do people process discrepant status information in assessing each other's probable abilities to contribute to a shared task?

The results of those few experiments that do address this problem -- notably, Webster and Driskell 1978; and Zelditch *et al.* 1980 -- largely support the combining principle. When the *combining* model is fitted to Webster and Driskell's data, we find the fit to be exceptionally good ($X^2 = 0.261$, df = 1, P = .6095). In contrast, when the *balancing* model is fitted, we find the fit to be inadequate ($X^2 = 4.754$, df = 1, $p < .05$). Further details are given in Tables 3 and 4.

Table 3 about here

Table 4 about here

Similarly, when the *combining* model is fitted to Zelditch *et al.*'s data, we find the fit to be excellent ($X^2 = 1.498$, df = 4, P = .8270); but when the *balancing* is fitted, we find the fit to be, at best, marginal ($X^2 = 8.549$, df = 4, $P < .10$).[4] A fuller description of these results is given in Tables 5 and 6.

Table 5 about here

Table 6 about here

As far as I can determine, there exists no published data that support the balancing principle more strongly than the combining principle. In social situations *that are strongly task-oriented,* it seems likely that people take into acount all indications of "likely task ability," including those that represent cultural and/or personal prejudices. The latter is unfortunate, and no one could condone the unfairness it sometimes produces for individuals; but the evidence suggests it is true. To the degree that criticisms of the BFNZ formulation have been motivated by the belief that a sizable body of existing evidence requires a balancing model, those criticisms evidently have been motivated by a misconception.

Differentiating vs. Equating Characteristics

How do people deal with status information that equates them? Suppose p and o both are high (or low, or average) on characteristic C_1. Is C_1 salient in such a case? Is equating information taken into account at all, or is it simply ignored? There are numerous inconsistencies in the status characteristics literature on this point (compare, for instance, Berger *et al.* 1980 with Martin and Sell 1985).

It is well established that a characteristic differentiating actors becomes salient -- unless, that is, it is explicitly dissociated from success or failure at the group's task, either by cultural prescriptions or by clear indications within the situation itself. (For a discussion of this principle, known as the "burden-of-proof principle," see Berger *et al.* 1977: 108-113; or Webster and Driskell 1985: 112-116.) In the case of a characteristic equating actors, the most compelling hypothesis is that it becomes salient only if it is explicitly associated with success or failure at the group's task, either by cultural prescriptions or by clear indications within the situation itself. Stated another way, the burden of proof is upon task-relevance for an equating characteristic, upon task-irrelevance for a differentiating characteristic.

Excluding the critical literature (for the time being), the two studies most pertinent to the issue of equating characteristics are the study by Berger et al. (1970) and that by Webster (1977). In the Berger et al. study, subjects were tested on two abilities, both of which, they were told, were correlated with ability at the task they would be performing later in the experiment. There were five experimental conditions, which can be signified by the notations (HH-LL), (HH-HL), (HL-LH), (LL-LH), and (LL-HH). In the first condition, the focal actor was high on both abilities (thus, HH), the other actor low on both (thus, LL). In the second condition, the focal actor was high on both, the other actor high on the first and low on the second; and so on. Notice that Conditions 2 and 4 operationalize equating characteristics. Moreover, those equating characteristics are abilities explicitly associated with success at the group's task.

When the BFNZ formulation with salience assumed is fitted to the experimental data, the fit is found to be very good (X^2 = 3.412, df = 3, P = .3325). When the BFNZ formulation with salience not assumed is fitted to the data, the fit is found to be considerably worse (X^2 = 8.115, df = 3, P = .0438). Under the first hypothesis, the model is retained; under the second, it must be rejected at the .05 level of significance. Once again, a fuller summary is given in the accompanying tables.

Table 7 about here

Table 8 about here

In the Webster (1977) research, the subjects were tested on three abilities, one being the task ability itself, the remaining two being talents neither associated with, nor dissociated from, success at the task. In two experimental conditions, subjects were equated at an average level on the two abilities of unspecified task-relevance; in two others, sujects were equated at a high level on these two abilities; and in four other conditions--control groups--subjects were given no feedback on their levels on the abilities of unspecified task-relevance, although they did take the tests. In <u>all</u> conditions, the subjects <u>were</u> given feedback on their levels of the task ability. Notice that these manipulations were similar to those of Berger <u>et</u> <u>al</u>. (1970), except that Berger <u>et</u> <u>al</u>. stated to their subjects explicitly that the equating characteristic was known to be associated with performance at the upcoming task, whereas Webster left the task-relevance of the equating characteristics unspecified. This was the <u>only</u> important difference.

When the BFNZ formulation <u>with</u> <u>salience</u> <u>assumed</u> is fitted to the data, the fit is very marginal (X^2 = 9.291, df = 4, P = .0542). When the BFNZ formulation <u>with</u> <u>salience</u> <u>not</u> <u>assumed</u> is fitted to the same data, the fit is much improved ($X^2 = 3.799$, df $= 4$, $P = .4339$).[7] More complete summaries are given in Tables 9 and 10 below.

Table 9 about here

Table 10 about here

Taken together, the Berger _et al_. (1970) and Webster (1977) studies clearly support the hypothesis that, for an equating characteristic, the burden of proof (unlike for a differentiating characteristic) is upon that characteristic's _relevance_ to the group's task. An equating characterisitic becomes salient only if it is explicitly associated with success or failure at the job to be accomplished.

As we will see very shortly, the two questions we have been considering in this section are central to an interpretation of the critical literature. I now wish to consider a major subset of that literature, which consists of the various papers by Hembroff, Martin, and Sell (1980, 1981, 1982). As suggested earlier, their research and theorizing is perhaps best seen as a further extension of the Freese-Cohen variant of the status characteristics research program, which differs in some respects from that branch of the program guided explicitly by the Berger-Fisek variant. These authors invariably use the BFNZ formulation as their alternative for comparison. For lack of an agreed upon designation, I shall refer to their set of interrelated research endeavors as the HMS research program.

THE HMS RESEARCH PROGRAM

An Extension of the Freese-Cohen Theory

Hembroff *et al*.´s theory postulates that an actor´s "expectation state value" (ESV) for self vis-a-vis other (another actor) is a weighted average of that actor´s assessments of their comparative diffuse status and performance characteristics. As in the BFNZ formulation, a diffuse status characteristic is a characteristic such as race, gender, or age, a characteristic with many culturally prescribed correlates. A performance characteristic, however, is a non-unitary *set* of what the BFNZ theory calls specific status characteristics. Two or more related abilities constitute a performance characteristic. The "cognitive weights" given to these characteristics, according to the theory, depend upon the consistency of the evaluations of the *elements* that make up each subset of status information.

For a diffuse status characteristic, the elements are the stereotypes associated with it in the actor´s culture. Some of those elements may be positively evaluated; others may be negatively evaluated. Evaluations, moreover, may be contingent upon the group´s task. Typically, the stereotypes associated with a diffuse status characteristic (for example, race) are not perfectly consistent among themselves: the *consistency* or "strength" of a diffuse status characteristic is practically always less than the hypothetical maximum.

For a performance characteristic, the elements are the subtraits that comprise it. If athletic ability were the performance characteristic in question, such subtraits as speed, agility, strength, stamina, and eye-hand coordination would (perhaps) comprise a reasonable list of its elements. For two individuals, p and o, if p were clearly faster, more agile, stronger, more indefatigueable, and better coordinated than o, then, for a situation involving the two of them, athletic ability would be a very strong performance characteristic, because it would differentiate p and o in several related ways, and the evaluative orderings would be perfectly consistent. According to the theory, the more consistent the orderings, the stronger the characteristic in determining the cognitive expectations of the actors in a social situation.

With this brief description of the theoretical portion of the program, let us now consider the HMS experiment.

The Experiment

Ten of the authors´ experimental conditions were reported in the paper, "Resolving Status Inconsistency," by L. A. Hembroff. Two of the same conditions, plus three others, plus two from another experiment were reported in the paper, "Total Performance Inconsistency," by L. A. Hembroff, M. W. Martin, and J. Sell. And a third set of conditions, including two new ones, was reported in the paper, "The Marginal Utility of Information," by

M. W. Martin and J. Sell. All told, there were fifteen separate conditions that are comparable to one another.

The experiment entailed manipulations of two kinds of status information: (1) a diffuse status characteristic; and (2) a performance characteristic. The first was relative age. All the subjects in the experiment were female college students 17-21 years of age; the age manipulation was a manipulation of the age of the subject's partner, who was an accomplice of the experimenter. Each subject was introduced to her partner through a television monitor. (The subjects were told that their partners were in an adjacent experimental room.) To induce the naive subject into a "high" state of the relative-age characteristic, she was introduced to a partner who was an 11-year-old girl. During the introductions, this partner stated, in response to a question from the experimenter, that she liked "to play with dolls ... and ... with my brother's electric train" (Hembroff 1978, p. 112). To induce the subject into a "low" state, she was introduced to a 38-year-old woman, who stated that she liked to attend movies and listen to music. The second kind of status information manipulated--the "performance" characteristic--was a fictitious talent referred to as "Contrast Sensitivity," described as " ... the ability to determine continuities and discontinuities between unfamiliar symbols or patterns" (Hembroff 1978, p. 109). The subjects were told that Contrast Sensitivity is a single ability consisting of multiple subtraits which are best measured by separate tests. Each subject (except those in the status-only conditions) was given three to five paper-and-pencil tests, each test purportedly a measure of her level of ability on a subtrait of Contrast Sensitivity. When the tests were completed and (purportedly) scored, the subject was told that she achieved a very high, or a very low, score on each test, the particular pattern of highs and lows depending upon the experimental condition. For instance, in one of the conditions, the subject was informed that she achieved three very high scores and one very low score. By design, her partner appeared to have achieved the reverse pattern. That is to say, the naive subject (purportedly) got the results, H-L-H-H, on four tests; her fictitious partner was portrayed as having gotten the results, L-H-L-L, on the respective tests. Hembroff _et al_. created their fifteen experimental conditions by crossing seven different "performance" levels (including that of no information) with three different levels of the relative-age variable (high, low, and no information), omitting the six possible combinations that seemed least interesting.

Fit of the Variant Model

Does the Hembroff _et al_. theory accord with the pre-existing data that inspired it? Does it fit the new data collected to test it? Let us investigate the first question briefly, the second in more detail.

Hembroff (1978, p. 39; 1982, p. 188) presented a formula for computing an actor's expectation state value.[8] I have used this formula to compute the ESV associated with each of the six experimental conditions of Freese and Cohen's study. Nowhere do Hembroff, Martin, or Sell specify precisely how an ESV is supposed to be related to observable behavior; but Hembroff did assert that P(S) values " ... are assumed to be a monotonic function of ESVs ... " (Hembroff 1982, p. 193). For lack of more precise guidance, I have assumed that this montonic function, whatever its exact form, can be approximated by the linear form: $P(S) = m + q\ ESV$. I have fitted this model to Freese and Cohen's data. The results are summarized in Table 9. (It should be noted that alternative functional forms, such as the logit or probit form, make almost no difference in the predicted values or in the chi-squared goodness-of-fit results.)

Table 11 about here

As Table 11 shows, the fit of the model to the data is acceptable ($X^2 = 6.763$, $df = 4$, $P = .1490$). While the fit is acceptable, a comparison of these results with those reported in Tables 1 and 2 shows that, for these data, the HMS formulation is not an improvement over the BFNZ formulation.

Consider now the results from the HMS experiment itself. I computed the values of the ESV variable for each of Hembroff et al.'s fifteen experimental conditions, and again fitted the model. The results are given in Table 12.

Table 12 about here

As the chi-squared goodness-of-fit test shows, the model does not fit the data particularly well. The discrepancies between the observed and predicted P(S) values cannot reasonably be attributed to chance alone ($X^2 = 29.432$, df = 13, $P < .01$).

If we consider only the ten experimental conditions reported by Hembroff (1982), our conclusion remains essentially the same. We find the fit of the model to the data to be inadequate ($X^2 = 16.647$, df = 8, $P = .0340$).

Hembroff et al.'s conclusions differ from these. Hembroff stated that " ... general support for the set of predictions is concluded. Since [the] deviations are easily accounted for by random error, a high degree of consistency between the model and the observed outcomes is concluded" (Hembroff 1978, p. 92). This general assessment is echoed in Hembroff et al.'s other papers as well (see, for example, Hembroff, Martin, and Sell 1981, p. 429; Hembroff 1982, pp. 198-201; and Martin and Sell 1985, p. 181). This assessment rests upon two kinds of observations: (1) comparisons of predicted rank-orderings among triples of P(S) values; and (2) results from a statistical test proposed by Sell and Freese (1977, 1984). Many of the unresolved issues in the theory of status characteristics and social interaction stem from different researchers looking at the same evidence and drawing different conclusions. In the following two sections, I shall examine the statistical procedures used by Hembroff et al. My objective is to shed some light on why those procedures lead to conclusions so very different from the conclusions suggested by the results from fitting and testing explicit parametric models.

Tests of Ordinal hypotheses

It will be helpful to proceed in terms of a concrete example. Hembroff (1982) based his conclusions, in part, on tests of four pairs of ordinal hypotheses. One of these was the following:

Hypothesis 1a: $P(S)_1 = P(S)_2 > P(S)_3$

In this statement, the subscripts of P(S) refer to the experimental conditions as listed in Table 4, numbered from top to bottom.

The actual (parametric) predictions of the Hembroff formulation for these three experimental conditions are .6690, .6485, and .5769, respectively (see Table 4). Thus, the = of the first relation, strictly speaking, is >. Hembroff reasoned that the predictions are so close that = is the more appropriate description.

Hembroff evaluated this hypthesis by carrying out a pair of t tests, the first comparing the mean numbers of stay-responses per subject for Conditions 1 and 2, the second comparing the means for Conditions 2 and 3. From the first test, he found the difference of means not significant ($t = 0.214$, $df = 48$, $P > .50$). From the second, he found the difference significant ($t = 3.217$, $df = 48$, $P < .01$). Since these t test results are consistent with the hypothesis, he reported support for his model.

Hembroff also tested a counterpart to this hypothesis, the prediction of the BFNZ model:

Hypothesis 1b: $P(S)_1 > P(S)_2 > P(S)_3$

Notice that > replaces = in the first relation.

The actual (parametric) predictions of the BFNZ model are .6691, .6407, and .5827, respectively. These actual predictions are all very close to the actual predictions of the Hembroff model. Nevertheless, the results from the t tests, while they support Hypothesis 1a, do not support Hypothesis 1b.

A question that arises is: At what point can = legitimately replace > in the statistical hypothesis? As our concrete example illustrates, this decision has very important consequences for the interpretations of the results of the subsequent t tests. If > is taken to be the theoretical prediction, then rejecting the t test's null hypothesis supports the theory; but if = is the theoretical prediction, then failing to reject the null hypothesis supports the theory. What is to prevent the analyst from conducting the t test first, and then deciding whether to make > or = the theoretical prediction?

Hembroff seems to suggest that the methodology of ordinal comparisons is uniquely well suited for choosing between competing formulations. His use of that methodology, however, involves too many arbitrary decisions; and it ignores the requirement that a decision rule for choosing among hypotheses be grounded in a defensible conception of chance variations.[9]

The use of an ordinal methodology seems in many ways a throwback to an earlier period in which status characteristics theory permitted only ordinal comparisons. In my judgment, the advantages of explicit models and a methodology appropriate to them are enormous.

The Sell-Freese Statistical Test

The most cryptic support for Hembroff *et al.*'s formulations has been generated by a statistical procedure proposed by Sell and Freese (1977, 1984). Inexplicably, the validity of this procedure -- and of the findings it has generated -- has never been questioned. Does this decision tool in fact adequately address issues of status characteristics theory?

Most status characteristics experiments have entailed subjects making sequences of decisions, which are recorded as stay-responses or change-responses. The researcher typically has *not* been concerned about the precise response sequences. If the experimental protocol entails T trials, all sequences that result in K stay-responses and T - K change-responses are considered equivalent. But it is possible to distinguish among different sequences typically treated as equivalent. For example, the response-sequences S-S-C-C and C-S-C-S both contain fifty percent stay-responses; but the first involves a single transition from one type of response to the other, whereas the second involves three such transitions. It is possible to focus upon *transitions*.

Let a pair of contiguous trials, in the abstract, be denoted trial t and trial t+1. Consider the following transition matrix.

		Trial t	
		Stay	Change
Trial t+1	Stay	$1-\alpha$	π
	Change	α	$1-\pi$
		1.0	1.0

In this diagram, $1-\alpha$ is the probability that an actor stays on trial t+1, given that he or she stayed on trial t. Similarly, $1-\pi$ is the probability that an actor changes on trial t+1, given that he or she changed on trial t. And α and π themselves are the probabilities of switching.

It is possible to estimate α and π for each experimental condition, or even for each pair of contiguous trials of each experimental condition.

The Sell-Freese statistical test focuses upon these trial-by-trial sequences; it makes use of a quantity I shall denote Γ, defined as follows: $\Gamma = \pi - \alpha$. That is, gamma is the <u>difference</u> between the two switching probabilities. Sell and Freese refer to this as " ... the first derivative of the decision process" (Sell and Freese 1984: p. 546).

Let Γ_1 and Γ_2 be the "derivatives" from two different experimental conditions, which we can call Condition 1 and Condition 2, respectively. Sell and Freese assert that Γ_1 and Γ_2

differ _if_ _and_ _only_ _if_ a different decision process operates in the two experimental conditions. Therefore, they propose testing the following null hypothesis:

$$H_0: \quad \Gamma_1 = \Gamma_2$$

They suggest testing this hypothesis over and over again, using the data from trials 1 and 2, those from trials 2 and 3, those from trials 3 and 4, and so on. Altogether, their procedure entails T-1 separate tests, where T is the number of critical trials.

Hembroff and his associates used this procedure to demonstrate the equivalence or non-equivalence of pairs of experimental conditions, their objective, in most instances, being to choose between their theory and the BFNZ theory.

While this objective itself may be important, there are three difficulties entailed by the Sell-Freese procedure, two merely troublesome, the other more serious. Multiple tests such as this procedure entails are notoriously difficult to interpret. If each component test is carried out at the .05 level, and the complete procedure involves T-1 components (thirty-one in the HMS research), we would expect some "significant" results by chance alone. Often this type of problem -- simultaneous inferences for a whole family of tests -- is handled by the Bonferroni method (Morrison 1976: 33-34). Sell and Freese do not recommend the Bonferroni method; instead, they recommend some _ad_ _hoc_ adjustments. But if the Bonferroni method were substituted for their _ad_ _hoc_ adjustments, the consequence would be many fewer apparently significant outcomes.

A second difficulty is that, if the experimental trials are statistically independent (the remaining cases will be considered shortly), the test entails a grossly suboptimal use of relevant information. If the experimental trials are statistically independent, $1-\alpha = \pi = P(S)$. Thus, $\Gamma = 2\ P(S) - 1$. And the null hypothesis stated above is logically equivalent to the following:

$$H_0: \quad P(S)_1 = P(S)_2$$

When this is the hypothesis of interest, however, the most efficient way to test it is to pool the data from all the trials, and carry out a single test. We would not do T-1 separate tests, for that would entail a large loss of statistical power, as well as the interpretive ambiguities mentioned above.

A third difficulty involves the remaining cases, those in which the experimental trials are not statistically independent. In the previous case, the Sell-Freese test, though inefficient, is technically valid. In the remaining cases, there is a logical problem that makes the test's results much more dubious.

Suppose $1-\alpha$ is a function of both a subject's expectation state and his or her previous involvement in the "decision process" (that is, his or her responses on previous trials). We can represent this as follows: $1-\alpha = f(E,\delta)$, where E symbolizes a particular theoretical conception of the subject's expectation state, δ indexes the relevant temporal dependencies or history. Similarly, suppose $\pi = g(E,\delta)$. It follows that $\Gamma = g(E,\delta) + f(E,\delta) - 1$. Let Γ be specified as $\Gamma(E,\delta)$, to make explicit its dependence on both the expectation state of the focal actor and the history of the decision process through the time-point of interest. We must assume here that Γ does in fact depend upon δ, because otherwise we have an independent trials process, and we are back to the previous special case.

The Sell-Freese null hypothesis now becomes equivalent to the following, where E and δ take on the roles of parameters of an abstract population defined by an experimental condition:

$$H_0: \quad \Gamma(E_1, \delta_1) = \Gamma(E_2, \delta_2)$$

At this point, the problem for interpreting the results of the test can easily be seen. If our theoretical hypotheses are about the compositions of the subjects´ expectation states, then no conceivable outcome of this test can provide us with trustworthy information. If the null hypothesis is rejected, that could be because E_1 does not equal E_2, because δ_1 does not equal δ_2, or because of some combination of these. Similarly, if the null hypothesis is not rejected, that does not imply that E_1 equals E_2, for these might have different values which are compensated for by differences between δ_1 and δ_2. In short, results from the Sell-Freese test confound status information as represented by E, and "history effects" as represented by δ.[10]

Given that the various papers by Hembroff, Martin, and Sell draw conclusions based almost exclusively upon tests of ordinal comparisons and/or tests of differences in "derivatives," and given that these methodologies are in question, what can we actually conclude from this body of work?

Conclusions From the HMS Work

All the papers by Hembroff, Martin, and Sell embrace certain consistent themes, both in their opening statements and in their conclusions. They all characterize the early work by Freese and Cohen as demonstrating problems with the BFNZ formulation. They all characterize their own theoretical work as offering solutions to those problems. And they all see their research as confirming the validity of their proposed solutions (Hembroff, Martin, and Sell 1981, p. 429; Hembroff 1982, pp. 200-01; Martin and Sell 1985, p. 181). These themes require modification in at least the following ways. First, neither Freese and Cohen's work nor the HMS work itself provides compelling reasons for believing that subjects in experiments with strong task-orientations ignore relevant status information. Second, no published study has successfully differentiated between the BFNZ and HMS formulations -- the Hembroff model makes ordinal predictions that, for the most part, are identical to those of the BFNZ model. Third, the various results from the Sell-Freese statistical test (which show no clear pattern anyway) are in question, because the logic of that test does not adequately isolate and target the linkages between status information, expectation-states, and actions.

While the preceding remarks take issue with much of the HMS work, I must add that this work does have many attractive features. The research is creative and informative; and the emphasis upon process considerations is an emphasis that the entire field would do well to emulate.

BROADER SIGNIFICANCE OF THE CRITICAL WORK

An Alternative Mode of inquiry

One additional contribution of the critical work, I believe, is that it raises questions important for extending any version of the theory of status characteristics and social interaction. Experiments guided explicitly by the BFNZ formulation have, as a matter of strategy, bypassed certain potential issues. Experiments not guided as closely by this formulation have sometimes employed status manipulations that bring these issues to the fore. In this section, I wish to examine--or, in the first case, reexamine--work relevant to the theory, employing a different strategy. I shall assume that the essential features of the BFNZ formulation are correct, and use that assumption to infer how subjects must have defined the situations in which they found themselves in these studies. While this is not theory-testing in a strict sense, it is a strategy that could produce useful insights.

The HMS Experiment Revisited

The most provocative part of the HMS theory and research is its notion of a status characteristic with subsidiary components. In the HMS research, if the subtraits of Contrast Sensitivity had been given separate names, and been characteristized as separate abilities, rather than as components of the same ability, these subtraits would be treated in the BFNZ formulation as multiple specific status characteristics. Alternatively, if the subtraits had been measured with consistent results, the BFNZ formulation would clearly apply, although there would be some question at to whether Contrast Sensitivity should be treated as one, or more than one, specific status characteristic. The HMS experiment introduced a variable not found in other status characteristics research: the believability of the specific status information.

My conjecture is that when subjects' performances on tests measuring different abilities are inconsistent, this does not call into question the credibility of the performance information itself. It is readily conceivable for people to have different levels of different abilities. In contrast, when subjects' performances on tests supposedly measuring the same ability are grossly inconsistent, that does call into question the accuracy or dependability of the performance information.

I would speculate that experimental subjects, whatever their private uneasiness, typically behave as if the performance information they receive is valid, so long as the credibility of that information is above a certain threshhold. Applications of the BFNZ formulation assume that the experimental subjects accept the information they have been given as valid. Let CR denote a quantitative measure of the credibility of the performance information provided to the subjects; and let τ denote the critical threshhold. My conjecture is: If $CR \geq \tau$, the principles of the BFNZ formulation operate in a way that is predictable in advance by a researcher; if CR < τ, the principles of the BFNZ formulation do not operate predictably. In the latter instances, subjects make idiosyncratic definitions of the situation, which are not easily amenable to research.

Hembroff's measure of the absolute strength of the performance characteristic is plausibly reinterpreted as a measure of the credibility of the performance information provided in that experimental condition. In addition, Hembroff's estimate of the absolute strength of the diffuse status characteristic (relative age) is plausibly reinterpreted as an estimate of the critical threshhold. (The absolute strength of the relative age variable functions as a sort of threshhold in Hembroff's analysis.) This estimate is 0.4. I have applied the BFNZ formulation to the entire set of fifteen experimental conditions, and also to the subset of the HMS data for which CR ≥ 0.4. The results are presented in Tables 13 and 14.[11]

Table 13 about here

Table 14 about here

The results for all fifteen conditions show large discrepancies between the observed and predicted P(S) values, but it is not clear that the discrepancies are patterned in any way. In contrast, the results for the subset for which CR ≥ 0.4 indicate a fit within the range of statistical acceptability ($X^2 = 10.621$, df = 6, P = .1008). The largest error of prediction is just over

.03, four of the errors are less than .01.

Knottnerus and Greenstein

Further challenges for the conceptual framework of the BFNZ formulation are presented by the work by Greenstein and Knottnerus (1980) and Knottnerus and Greenstein (1981). This work challenges the limits of the burden-of-proof principle, encountered earlier. The burden-of-proof principle states that, in forming expectation-states, people use status information that differentiates them, even if that information is not initially relevant to success or failure at the group´s task, unless that information is explicitly dissociated from success or failure at the group´s task.

In the first phase of their experiment, Greenstein and Knottnerus (1980) tested their subjects on an ability referred to as "modes of perception," which involved figuring out which of two geometric figures predominates in a pattern. The test consisted of fifteen patterns shown on a screen, one after the other. For each slide, a subject purportedly could be "right" or "wrong." (In fact, however, the patterns were ambiguous, and there were no demonstrably correct or incorrect answers.) After the test was completed, it was (purportedly) scored; and, except for those in a control group, the subjects were given their scores.

Also in the first phase, the subjects were introduced to a (fictitious) partner, with whom they were told they would be working during the second phase of the experiment. In four of the nine experimental conditions, this introduction constituted a relative-age manipulation similar to that described for the HMS experiment

In the second phase, Greenstein and Knottnerus asked the naive subject to engage in a collective effort with a "partner" (purportedly another subject). The collective task was referred to as "forming uncommon words." Ability at this task was at no time explicitly associated with ability at "modes of perception." This second phase had 30 critical trials. On each trial, the naive subject made an initial proposal of an "uncommon word," using sixteen letters projected on a screen by the experimenter. The subject´s initial proposal then was (purportedly) communicated to the other person, and the other person´s was communicated to the naive subject. Then each subject made a final proposal. The final proposal was required to be <u>either</u> the subject´s initial proposal <u>or</u> the other person´s initial proposal, received when the initial proposals were communicated. The <u>dependent</u> <u>variable</u> was the proportion of times the subject used his or her partner´s initial proposals. [Greenstein and Knottnerus thus report P(C) rather than P(S).]

Greenstein and Knottnerus (1981) reported results for five experimental conditions; Knottnerus and Greenstein (1981) reported results for six, four of which were new ones. In all, there were nine different experimental conditions.

How did Knottnerus and Greenstein´s conditions differ from

A simplicity criterion suggests first trying a path that is one segment longer, trying more complicated possibilities only if this simplest possibility proves empirically inadequate. Concerning the "no status information" control group, I opted for the conservative hypothesis that a subject's definition of the situation in such a condition, since it cannot be based on known status characteristics, lies outside the present scope the BFNZ formulation.

Under these hypotheses, I fitted the BFNZ model to the eight suitable conditions of Knottnerus and Greenstein's experiment. The results are summarized in Table 15.

Table 15 about here

From these results, it can be seen that the conformity demands in Knottnerus and Greenstein's research setting did indeed greatly lower a subject's probability of making a stay-response. In addition, as hypothesized, the partially dissociated status characteristic (identified in Table 15 by asterisks) did have less impact on observable behavior than did the comparable (initially) non-associated characteristic. Taken as a whole, these results are very well described by the BFNZ formulation ($X^2 = 3.413$, df = 6, P = .7555).

In should be noted that, if $e_p - e_o = 0$, the predicted value of P(S) is approximately 0.26. For the "no information" control group, the observed P(S) was approximately 0.32. It would appear that "no status information" does <u>not</u> translate into a cognitive expectation of "no difference in ability."

Martin and Sell (1985)

A relatively recent study by Martin and Sell (1985), not based on the HMS data, investigates the effects of _diffuse-status equating_ characteristics. The Berger _et al_. (1970) and Webster (1977) studies, discussed earlier, investigated the effects of _specific_-status equating characteristics. Although the distinction between diffuse and specific status characteristics is important for some purposes, the BFNZ formulation actually makes very little use of this distinction.[12]

In Martin and Sell's experiment, the researchers manipulated information on a performance characteristic (in BFNZ terms, two related specific status characteristics). They created three levels: (HH-LL), (LL-HH), and a control level. They also manipulated information on a diffuse status characteristic. On this second factor, they created two levels: "characteristics equated," and a control level. To generate the first level, they emphasized to the subject that she and her "partner" were _equal_ in age, sex, and university classification. In the control level, the subject was given no information on the age, sex, or university classification of her "partner." The performance and diffuse status levels were crossed to define six experimental conditions.

In applying the BFNZ formulation to Martin and Sell's data, three observations are pertinent. First, the BFNZ formulation conceives of Martin and Sell´s equating characteristics as not salient, because, while they were deliberately and emphatically brought to the subjects´ attention, they were not explicitly associated with success or failure at the group´s task.[13] Second, the combination of no performance information with no diffuse status information produces a condition like that of the control group in Knottnerus and Greenstein´s research. And third, since diffuse status information is not salient, the combination of no performance information with "equating information" on diffuse status also produces such a condition. As stated previously, such a "no salient status information" condition lies outside the present scope of the BFNZ formulation.

Fitting the BFNZ formulation to the four conditions to which it does apply produces the results recorded in Table 16.

Table 16 about here

This analysis yields an excellent fit between the model and the data ($X^2 = 0.630$, df = 2, P = .7298). These results confirm that diffuse-status equating characteristics not explicitly associated with success or failure at the group´s task are not salient, which is exactly what the BFNZ formulation predicts.

Finally, if $e_p - e_o$ were equal to zero, the predicted value of P(S) would be 0.709. The observed P(S) values in the two conditions providing no salient status information are 0.732 and 0.756.

Problems for Further Investigation

These experiments were conducted primarily for purposes other than testing the BFNZ formulation. Fitting the BFNZ model to these data has required some auxiliary assumptions, which suggest problems for further study.

When the subjects in an experiment are provided with no salient status information, it must not be assumed that this induces them to act without a definition of the situation. According to the BFNZ model, if $e_p - e_o = 0$, $P(S) = m$, the first parameter of the model. The available data are not consistent with the idea that an absense of salient status information leads to expectations of equal ability. Evidently, actors in such circumstances attend to other cues, forming expectations on the basis of those other cues. While some work relevant to this problem has already been done (see Berger et al. 1985), learning more about the cues to which people attend seems fundamental to progress in theory of status characteristics and social interaction.

Another problem requiring more study is that of how people complete their definitions of the situation when they have available partially dissociated status information. The BFNZ formulation conceptualizes such completion processes in terms of paths-of-relevance. For the most part, there exist clear rationales for ascertaining the path lengths involved (see Berger et al. 1977, PP. 100-21). In analyzing the Knottnerus and Greenstein data, I posited path lengths that seem correct in that they provide a good empirical fit; but compelling theoretical rationales for these remain to be developed.

Finally, it is important to learn more about the operation of status organizing processes in situations with conformity demands. In the classic expectation-states experiment, conformity demands are effectively neutralized by the experimental procedures. But researchers increasingly are developing and employing open-interaction designs (see, for example, Rainwater _et al_. 1988; Ridgeway 1987; and Ridgeway and Diekema 1989). In open-interaction experiments, there is no clear way to eliminate the social pressures that stem from people´s desires for social approval. Perhaps such pressures could be considered constant across experimental conditions in some cases, but ultimately the most effective way to handle the complications that arise as we move to open-interaction experiments, in my judgment, is to build models that simultaneously deal with status organizing processes and conformity processes. Grounded in the understandings gained from status characteristics theories and research, it should be feasible to pursue this objective. The result, if successful, would be a general theory of status characteristics and social influence, dealing simultaneously with the formation of _expectation states_ and with the quest for social approval, the latter grounded to some degree in the emotional needs of the actors in a social situation.

ASSESSMENT OF THE COMPETING FORMULATIONS

The principal purpose of the foregoing analyses is to assess a body of theoretically motivated research bearing directly on the theory of status characteristics and social interaction. Without question, the most prominant formulation of the theory is that presented in the Berger et al. (1977) treatise; however, in recent years a number of competing formulations have been proposed, most notably the theory of status-inconsistency effects set forth by Hembroff et al., and the theory of status validation set forth by Knottnerus and Greenstein.[14]

The emergence of competing or variant theories is a healthy development, an indication of the vitality of an area of inquiry. For the benefits of the competition to be most fully realized, it is necessary, from time to time, to take stock of the various formulations and try to choose among them.

How can this be done? Why should we prefer one theory of status characteristics and social interaction to another? There is no simple and definitive answer to such a question, but certainly considerations of empirical adequacy, scope, and fruitfulness are very important. Concerning this first, this paper has shown that the BFNZ formulation is remarkably successful in accounting for a variety of empirical data, both those collected to test the BFNZ formulation itself, and those collected for other purposes. That the BFNZ formulation rates high on empirical adequacy is an inescapable conclusion from the set of analyses contained in this paper. Since the other criteria have not been explicitly considered, it is appropriate to close with a brief assessment of the scope and fruitfulness of the alternative theoretical formulations.

Concerning scope, the HMS and Knottnerus-Greenstein formulations are relatively narrow in their range of application. The HMS formulation does not apply unless a performance characteristic has at least two subtraits. The authors assure that this will be true by fiat, that is, by their definition of a performance characteristic. But this does not bannish the question of how an actor will process status information when that information includes knowledge of just a single skill or ability, with or without additional information about diffuse status. The great majority of status characteristics experiments described in the literature thus lie outside the scope of the Hembroff et al. theorizing. Similarly, the Knottnerus-Greenstein theory applies only if a situation tenders information about both specific and diffuse status characteristics and the rank-orderings produced by the associated evaluations are consistent. In contrast, the BFNZ formulation accounts for status organizing processes in both these kinds of situations, and in many more as well.

Since 1977, the BFNZ formulation has been enormously fruitful, stimulating the growth of sociological knowledge in several different directions, applied as well as theoretical (see, for example, the many theoretical, research, and applications papers in Berger and Zelditch 1985; Webster and

Foschi 1988; and Berger et al. 1989). The BFNZ book explicates an interrelated set of substantive ideas, a few of which are the burden-of-proof principle, the principle of organized subsets, and the attenuation principle. In addition, the BFNZ book sets forth a system for diagramming an actor's initial and completed definitions of the situation, the transitions between the two deriving from the principles just mentioned. These diagrams are much more than cosmetic. They provide a sociological interpretation of some abstract ideas from the area of mathematics known as graph theory. The correspondence between the sociological theory and the mathematical system has permitted researchers to deduce the implications of the sociological theory for situations involving any numbers of actors, possessing any number of specific and/or diffuse status characteristics, constrained or unconstrained by an external reward structure.

As research guided by the BFNZ theory progresses, the sociological community will slowly but surely come to understand where the theory may need revision. Formal theory serves that very important function: It guides the research that eventually isolates its own weaknesses. While the efforts of those who have proposed alternative formulations have a great deal of merit, it nevertheless would promote faster progress if more efforts were directed towards the more modest goal of isolating replicable patterns. No proposal for a new formulation makes much of a contribution to cumulative scholarship unless the proposed formulation, compared to the one it is intended to replace, has clearly superior predictive validity, along with comparable scope and fruitfulness.

APPENDIX A

COMPUTATION OF AN ACTOR´S EXPECTATION ADVANTAGE

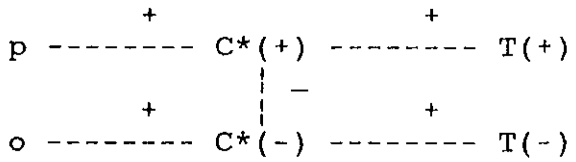
The Focal Actor´s Expectation Advantage

In the BFNZ theory of status characteristics and social interaction, the actors in a social situation are seen as being connected to the possible task outcomes by paths-of-relevance. For anyone who wishes to use the theory in their own research, pages 91-134 of the BFNZ treatise are essential reading. This appendix deals mainly with computational procedures for obtaining the numerical value of an actor´s expectation advantage, as the latter is conceptualized in the theory.

Consider a relatively simple situation entailing two actors, p and o, working together on a task T. By convention, p is the actor upon whom the analysis focuses. Let C* denote the talent or ability instrumental to success at T. And suppose p possesses a relatively high level of C*, while o possesses a relatively low level.[1] By hypothesis, the focal actor´s definition of the situation can be diagrammed as follows:

---

[1] This notation is fairly standard in the literature. Ordinarily, the task is best thought of as a subtask, or limited part, of some larger endeavor. In the classic expectation-states experiment, it is a single trial, which is merely a piece of what the subjects themselves think of as the task.



This diagram is the graph-theoretic representation of the essential elements of the situation. It is hypothesized that p is connected to the possible task outcomes by two positive paths of lengths 2 and 3, while o is connected by two negative paths, also of lengths 2 and 3. Verbally: (1) "p has a high level of the task ability, which is associated with success at the task," (2) "p has a high level of the task ability, which is the reverse of a low level, which is associated with failure at the task," (3) "o has a low level of the task ability, which is associated with failure at the task," and (4) "o has a low level of the task ability, which is the reverse of a high level, which is associated with success at the task." Notice that the <u>length</u> of a path corresponds to the number of segments in a parsimonious but complete chain of reasoning.

The path-segments have <u>signs</u>, + or - , associated with them. When a path-segment corresponds to the phrase, "is the reverse of" [for instance, the segment between C*(+) and C*(-)], the sign is a "minus." In all other cases, the sign is a "plus." Dimensionality relations (those with "minus" signs) exist only between oppositely evaluated states of a status characteristic.

The sign of an <u>entire path</u> is obtained by multiplying the signs of its segments, along with the sign of the task outcome at the end of it, using a rule analogous to that of ordinary algebra for multiplying signed numbers. For the respective paths of my example, (+)(+)(+) = (+), (+)(-)(+)(-) = (+), (+)(+)(-) = (-), and (+)(-)(+)(+) = (-). Thus, p´s two paths are positive, and o´s two paths are negative.

It is essential to distinguish between positive and negative paths, because the subsets of each person´s paths defined by this distinction (four subsets in all) must be dealt with separately in computing p´s expectation advantage. The need for separate consideration is due to the <u>principle of organized subsets</u>, an important substantive principle of the theory.

In making the computations for obtaining $e_p - e_o$, it is helpful to organize the calculations for each subset in accordance with a table such as the following:

Path Length	Path Strength	Number of Paths
2	f(2)	n_2
3	f(3)	n_3
4	f(4)	n_4
5	f(5)	n_5
6	f(6)	n_6

In the BFNZ theory, f(i) is the strength of a path of length i, conceptualized as a real number between zero and one.

Notice that path-lengths less than 2 or greater than 6 are not represented in this table. This is because such paths do not enter into the calculations. Theoretically, the strength of a path of length 1 can be thought of as the believability of a single path-segment (for instance, "p is male"), which is considered to be near one (on a scale of zero to one). At the other end, a path of length 7 is presumed to have a strength near zero, which is why such paths need not be considered. In general, the longer the path, the less its strength. Stated another way, the longer a path-of-relevance, the more tenuous the inferences it permits to the focal actor.

The combined strength of a subset of paths is calculated from the following formula:

$$e = 1 - \{[1-f(2)]^{n2}[1-f(3)]^{n3} \ldots [1-f(6)]^{n6}\} \qquad [1]$$

For a two-person situation, there are four such calculations that must be made. In our illustration:

$$e_{p+} = 1 - \{[1-f(2)]^{1}[1-f(3)]^{1}[1-f(4)]^{0} \ldots [1-f(6)]^{0}\}$$
$$= 1 - \{[1-f(2)]\cdot[1-f(3)]\cdot1\cdot1\cdot1\}$$
$$= f(2) + f(3) - f(2)\cdot f(3)$$
$$e_{p-} = 1 - \{[1-f(2)]^{0}[1-f(3)]^{0} \ldots [1-f(6)]^{0}\}$$
$$= 1 - \{1\cdot1\cdot1\cdot1\cdot1\} = 0$$
$$e_{o+} = 1 - \{[1-f(2)]^{0}[1-f(3)]^{0} \ldots [1-f(6)]^{0}\} = 0$$
$$e_{o-} = 1 - \{[1-f(2)]^{1}[1-f(3)]^{1}[1-f(4)]^{0} \ldots [1-f(6)]^{0}\}$$
$$= f(2) + f(3) - f(2)\cdot f(3)$$

After these four results have been obtained, we can compute an actor's (hypothesized) expectation advantage for the experimental condition in question.

$$e_p - e_o = [e_{p+} - e_{p-}] - [e_{o+} - e_{o-}] \qquad [2]$$

This formula implies that p's _expectation advantage_ is enhanced by o's negatively evaluated status characteristics, as well as by his own positively evaluated status characteristics. It is diminished by o's positively evaluated characteristics, as well as by his own negatively evaluated characteristics. Formula [2] also implies that p's "advantage" may be negative--that is, it may be a disadvantage.

Values of the f(i) Terms

We have been taking for granted that the f(i) quantities have definite numerical values. What are those values, and from where do they come? The 1977 version of the theory treated the f(i) terms as parameters to be estimated from the research data. Only two of them were conceived as independent, however, because of a theoretical relationship among them. This theoretical relationship can be stated as follows: There exists some fixed number k such that, for all permissible values of i,

$$f(i) = 1 - [1-f(i+1)]^k \qquad [3]$$

More recently, there have been efforts to find _a priori_ values, as opposed to estimated values, having some compelling theoretical rationale (see Fisek, Norman, and Nelson-Kilger 1989). For the analyses of this paper, I employed a set of _a priori_ values not previously found in the literature, which I shall now describe.

Given the constraint stated in formula [3], we can deduce that, for all permissible values of i, and for every positive integer n, the following holds true:

$$\{\mathrm{Log}[1-f(i)]\}/\{\mathrm{Log}[1-f(i+n)]\} = k^n \qquad [4]$$

As suggested above, the hypothetical path-strength f(1) has long been assumed to be close to one, and f(7) has long been assumed to be close to zero. Zero and one are the asymptotic values of the function, f(i), as i approaches plus infinity and minus infinity, respectively. Thus, the assumption is that f(i) has _nearly_ reached it lower limit when i = 1, and _nearly_ reached its upper limit when i = 7. Let us interpret _nearly_ as meaning to two decimal places.[2] That is, let f(1) = 0.995 and f(7) = 0.005. Now take i = 1 and n = 6 in formula [4] above; and substitute the postulated values of f(1) and f(7). Solving for k^6, we find that $k^6 = 1057$; therefore, k = 3.192.

At this point, we have the values of f(1), f(7), and k. From the last two of these, using formula [3], we can calculate f(6). From f(6) and k, we can then calculate f(5). From f(5) and k, we can then calculate f(4). And so on. When we finally

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[2] This choice is less arbitrary than it might appear; it is constrained by the value of k it produces. A more stringent criterion (for what is meant by "nearly zero" and "nearly one") leads to a larger value of k, a more lax criterion to a smaller value. The constraint is that k has a substantive meaning, _viz_., the number of paths of length L+1 equivalent (in information value) to a single path of length L. The correct value of k is ultimately an empirical question; but a value in the neighborhood of three is most often considered to be substantively plausible (cf. Berger _et al_. 1977, p. 138).

obtain f(2), we can use formula [3] to verify that f(1) = 0.995.

Carrying out the arithmetic to several significant digits, I arrived at the following values: f(2) = 0.809873, f(3) = 0.405556, f(4) = 0.150380, f(5) = 0.049779, and f(6) = 0.015871. That these *a priori* values are not too far from the empirical estimates reported by Berger *et al*. (1977) is remarkable. It is encouraging that their estimates are very consistent with reasonable assumptions about path-lengths outside the range employed to calculate $e_p - e_o$.

Returning to the illustration of section one of this Appendix, we find:

$$\begin{aligned} e_{p+} &= f(2) + f(3) - f(2)\cdot f(3) \\ &= 0.809873 + 0.405556 - (.809873)(.405556) \\ &= 0.886980 \\ e_{p-} &= 0.000000 \\ e_{o+} &= 0.000000 \\ e_{o-} &= 0.886980 \end{aligned}$$

Now using formula [2], the formula for an actor's expectation advantage, we get:

$$\begin{aligned} e_p - e_o &= [0.88698 - 0.00000] - [0.00000 - 0.88698] \\ &= 1.77396 \end{aligned}$$

This, then, is the value of p's expectation advantage for a situation like that described.

For many situations, the graph hypothesized to represent the focal actor's definition of the situation should include multiple status characteristics, specific and/or diffuse. In some cases, this graph should include actors besides p and o, and in some it should include aspects of reward systems imported from the larger cultural or structural context. The principles illustrated in this Appendix are by no means limited to simple cases like the one of my example. They can be applied to much more elaborate cases as well.

APPENDIX B

TABLES SUMMARIZING EXPERIMENTAL RESULTS

Table 1. Freese and Cohen (1973) - Combining Mode Hypothesized

Table 2. Freese and Cohen (1973) - Balancing Mode Hypothesized

Table 3. Webster and Driskell (1978) - Combining Mode

Table 4. Webster and Driskell (1978) - Balancing Mode

Table 5. Zelditch *et al*. (1980) - Combining Mode Hypothesized

Table 6. Zelditch *et al*. (1980) - Balancing Mode Hypothesized

Table 7. Berger *et al*. (1970) - Equating Char. Salient

Table 8. Berger *et al*. (1970) - Equating Char. Not Salient

Table 9. Webster (1977) - Equating Characteristic Salient

Table 10. Webster (1977) - Equating Characteristic Not Salient

Table 11. Freese and Cohen (1973) - Hembroff Model Hypothesized

Table 12. HMS Results - Hembroff Model Hypothesized

Table 13. HMS Results - BFNZ Formulation - All 15 Conditions

Table 14. HMS Results - BFNZ Formulation - CR ≥ 0.4 Subset

Table 15. Knottnerus and Greenstein (1980-81) - BFNZ Model

Table 16. Martin and Sell (1985) - BFNZ Formulation Applied

Table 1a. Freese and Cohen (1973) - Combining - Alternative

Table 2a. Freese and Cohen (1973) - Balancing - Alternative

Table 11a. Freese and Cohen (1973) - Hembroff Model - Alt.

TABLE 1. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY FREESE & COHEN (1973).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
(H-L)( )	0.38535	0.6969	0.6970	0.0001
(L-H)( )	-0.38535	0.5938	0.5968	0.0031
( )(HH-LL)	0.69645	0.7375	0.7374	0.0001
( )(LL-HH)	-0.69645	0.5687	0.5564	0.0123
(H-L)(LL-HH)	-0.31110	0.5906	0.6065	0.0159
(L-H)(HH-LL)	0.31110	0.6937	0.6874	0.0064

PREDICTED P(S) = 0.64693 + 0.12997 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 1.217, DEGREES OF FREEDOM = 4, P = 0.8753

NOTE: COMBINING MODE HYPOTHESIZED

TABLE 2. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY FREESE & COHEN (1973).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
(H-L)( )	0.38535	0.6969	0.6863	0.0105
(L-H)( )	-0.38535	0.5938	0.6074	0.0137
( )(HH-LL)	0.69645	0.7375	0.7182	0.0193
( )(LL-HH)	-0.69645	0.5687	0.5756	0.0068
(H-L)(LL-HH)	-0.69645	0.5906	0.5756	0.0150
(L-H)(HH-LL)	0.69645	0.6937	0.7182	0.0244

PREDICTED P(S) = 0.64688 + 0.10237 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 4.615, DEGREES OF FREEDOM = 4, P = 0.3291

NOTE: BALANCING MODE HYPOTHESIZED

TABLE 3. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY WEBSTER & DRISKELL (1978).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
(H-L)( )	0.38535	0.6773	0.6803	0.0030
(H-L)(LL-HH)	-0.31110	0.5833	0.5734	0.0099
( )(LL-HH)	-0.69645	0.5075	0.5143	0.0068

PREDICTED P(S) = 0.62116 + 0.15339 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 0.261, DEGREES OF FREEDOM = 1, P = 0.6095

NOTE: COMBINING MODE HYPOTHESIZED

TABLE 4. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY WEBSTER & DRISKELL (1978).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
(H-L)( )	0.38535	0.6773	0.6773	0.0000
(H-L)(LL-HH)	-0.69645	0.5833	0.5463	0.0370
( )(LL-HH)	-0.69645	0.5075	0.5463	0.0388

PREDICTED P(S) = 0.63063 + 0.12103 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 4.754, DEGREES OF FREEDOM = 1, P = 0.0292

NOTE: BALANCING MODE HYPOTHESIZED

TABLE 7. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY BERGER ET AL. (1970).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(HH-LL)	1.48985	0.8212	0.8055	0.0156
( )(HH-LH)	0.78917	0.7185	0.7420	0.0235
( )(HL-LH)	0.00000	0.6615	0.6705	0.0089
( )(LH-HH)	-0.78917	0.6205	0.5989	0.0215
( )(LL-HH)	-1.48985	0.5333	0.5354	0.0021

PREDICTED P(S) = 0.67047 + 0.09064 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 3.412, DEGREES OF FREEDOM = 3, P = 0.3325

NOTE: EQUATING CHARACTERISTICS ASSUMED SALIENT

TABLE 8. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY BERGER ET AL. (1970).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(HH-LL)	1.48985	0.8212	0.7950	0.0262
( )(HH-LH)	0.98990	0.7185	0.7531	0.0346
( )(HL-LH)	0.00000	0.6615	0.6702	0.0086
( )(LH-HH)	-0.98990	0.6205	0.5872	0.0332
( )(LL-HH)	-1.48985	0.5333	0.5453	0.0120

PREDICTED P(S) = 0.67015 + 0.08378 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 8.115, DEGREES OF FREEDOM = 3, P = 0.0438

NOTE: EQUATING CHARACTERISTICS ASSUMED NOT SALIENT

TABLE 9. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY WEBSTER (1977).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(AH-AL)	1.52725	0.7364	0.7362	0.0001
( )(AL-AH)	-1.52725	0.4200	0.4270	0.0070
( ) (H-L)	1.77396	0.7250	0.7612	0.0362
( ) (L-H)	-1.77396	0.4136	0.4020	0.0116
( )(HH-HL)	1.52725	0.7600	0.7362	0.0238
( )(HL-HH)	-1.52725	0.3762	0.4270	0.0508
( ) (H-L)	1.77396	0.7804	0.7612	0.0192
( ) (L-H)	-1.77396	0.4405	0.4020	0.0384

PREDICTED P(S) = 0.58162 + 0.10123 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 12.614, DEGREES OF FREEDOM = 6, P = 0.0496

NOTE: EQUATING CHARACTERISTICS ASSUMED SALIENT

TABLE 10. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY WEBSTER (1977).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(AH-AL)	1.77396	0.7364	0.7506	0.0142
( )(AL-AH)	-1.77396	0.4200	0.4125	0.0075
( ) (H-L)	1.77396	0.7250	0.7506	0.0256
( ) (L-H)	-1.77396	0.4136	0.4125	0.0011
( )(HH-HL)	1.77396	0.7600	0.7506	0.0094
( )(HL-HH)	-1.77396	0.3762	0.4125	0.0363
( ) (H-L)	1.77396	0.7804	0.7506	0.0299
( ) (L-H)	-1.77396	0.4405	0.4125	0.0280

PREDICTED P(S) = 0.58154 + 0.09529 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 8.129, DEGREES OF FREEDOM = 6, P = 0.2288

NOTE: EQUATING CHARACTERISTICS ASSUMED NOT SALIENT

TABLE 11. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY FREESE & COHEN (1973)

CONDITION	ACTOR'S EXPECTATION STATE VALUE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
(H-L)( )	0.70000	0.6969	0.6759	0.0210
(L-H)( )	0.30000	0.5938	0.6179	0.0242
( )(HH-LL)	1.00000	0.7375	0.7193	0.0182
( )(LL-HH)	0.00000	0.5687	0.5745	0.0057
(H-L)(LL-HH)	0.00000	0.5906	0.5745	0.0162
(L-H)(HH-LL)	1.00000	0.6937	0.7193	0.0256

PREDICTED P(S) = 0.57445 + 0.14486 (EXPECTATION STATE VALUE)

PEARSON'S CHI-SQUARED = 6.763, DEGREES OF FREEDOM = 4, P = 0.1490

NOTE: RESULTS BASED ON HEMBROFF MODEL

TABLE 12. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY HEMBROFF, MARTIN, & SELL

CONDITION	ACTOR'S EXPECTATION STATE VALUE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(3H1L)	0.75000	0.6712	0.6690	0.0022
(L-H)(3H1L)	0.65000	0.6762	0.6485	0.0277
(L-H)( )	0.30000	0.5987	0.5769	0.0219
(L-H)(2H1L)	0.40000	0.5900	0.5974	0.0074
( )(2H1L)	0.66667	0.6058	0.6519	0.0462
( )(1H2L)	0.33333	0.5737	0.5837	0.0100
(H-L)(1H2L)	0.60000	0.6675	0.6383	0.0292
(H-L)( )	0.70000	0.6762	0.6588	0.0175
(H-L)(1H3L)	0.35000	0.6037	0.5871	0.0166
( )(1H3L)	0.25000	0.5725	0.5667	0.0058
( )(2H2L)	0.50000	0.5750	0.6178	0.0428
(L-H)(2H2L)	0.30000	0.5912	0.5769	0.0144
(H-L)(2H2L)	0.70000	0.6775	0.6588	0.0187
( )(4H1L)	0.80000	0.6600	0.6792	0.0192
( )(1H4L)	0.20000	0.5300	0.5564	0.0264

PREDICTED P(S) = 0.51549 + 0.20468 (EXPECTATION STATE VALUE)

PEARSON'S CHI-SQUARED = 29.432, DEGREES OF FREEDOM = 13, P = 0.0057

NOTE: RESULTS BASED ON HEMBROFF MODEL

TABLE 13. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY HEMBROFF, MARTIN, & SELL.

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(3H1L)	0.56226	0.6712	0.6691	0.0022
(L-H)(3H1L)	0.25116	0.6762	0.6407	0.0355
(L-H)( )	-0.38535	0.5987	0.5827	0.0161
(L-H)(2H1L)	0.00000	0.5900	0.6178	0.0278
( )(2H1L)	0.31110	0.6058	0.6462	0.0404
( )(1H2L)	-0.31110	0.5737	0.5894	0.0157
(H-L)(1H2L)	0.00000	0.6675	0.6178	0.0497
(H-L)( )	0.38535	0.6762	0.6530	0.0233
(H-L)(1H3L)	-0.25116	0.6037	0.5949	0.0088
( )(1H3L)	-0.56226	0.5725	0.5665	0.0060
( )(2H2L)	0.00000	0.5750	0.6178	0.0428
(H-L)(2H2L)	0.25116	0.6775	0.6407	0.0368
(L-H)(2H2L)	-0.25116	0.5912	0.5949	0.0037
( )(4H1L)	0.76503	0.6600	0.6876	0.0276
( )(1H4L)	-0.76503	0.5300	0.5480	0.0180

PREDICTED P(S) = 0.61781 + 0.09119 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 40.131, DEGREES OF FREEDOM = 13, P = 0.0001

NOTE: COMBINING MODE HYPOTHESIZED

TABLE 14. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY HEMBROFF, MARTIN, & SELL.

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(4H1L)	0.76503	0.6600	0.6922	0.0322
( )(3H1L)	0.56226	0.6712	0.6740	0.0028
(L-H)(3H1L)	0.25116	0.6762	0.6460	0.0302
(L-H)( )	-0.38535	0.5987	0.5888	0.0099
(H-L)( )	0.38535	0.6762	0.6581	0.0181
(H-L)(1H3L)	-0.25116	0.6037	0.6009	0.0029
( )(1H3L)	-0.56226	0.5725	0.5729	0.0004
( )(1H4L)	-0.76503	0.5300	0.5547	0.0247

PREDICTED P(S) = 0.62347 + 0.08990 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 10.621, DEGREES OF FREEDOM = 6, P = 0.1008

NOTE: COMBINING MODE HYPOTHESIZED

TABLE 15. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY KNOTTNERUS & GREENSTEIN.

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(*H-L)	0.12972	0.2883	0.2849	0.0035
( )(*L-H)	-0.12972	0.2426	0.2363	0.0063
( )(H-L)	0.38535	0.3118	0.3328	0.0210
( )(L-H)	-0.38535	0.1937	0.1883	0.0054
(H-L)( )	0.38535	0.3200	0.3328	0.0128
(L-H)( )	-0.38535	0.2044	0.1883	0.0161
(H-L)(H-L)	0.69645	0.4067	0.3911	0.0156
(L-H)(L-H)	-0.69645	0.1178	0.1300	0.0123

PREDICTED P(S) = 0.26056 + 0.18740 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 3.413, DEGREES OF FREEDOM = 6, P = 0.7555

NOTE: COMBINING MODE HYPOTHESIZED

TABLE 16. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY MARTIN & SELL (1985).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
( )(HH-LL)	0.69645	0.7766	0.7800	0.0034
( )(LL-HH)	-0.69645	0.6293	0.6373	0.0081
(=)(HH-LL)	0.69645	0.7834	0.7800	0.0034
(=)(LL-HH)	-0.69645	0.6459	0.6373	0.0085

PREDICTED P(S) = 0.70868 + 0.10247 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 0.630, DEGREES OF FREEDOM = 2, P = 0.7298

NOTE: COMBINING MODE HYPOTHESIZED

TABLE 1a. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY FREESE & COHEN (1973).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
(H-L)( )	0.38535	0.7375	0.6911	0.0464
(L-H)( )	-0.38535	0.5687	0.6026	0.0339
( )(HH-LL)	0.69645	0.6969	0.7268	0.0299
( )(LL-HH)	-0.69645	0.5938	0.5669	0.0269
(H-L)(LL-HH)	-0.31110	0.5906	0.6111	0.0205
(L-H)(HH-LL)	0.31110	0.6937	0.6826	0.0112

PREDICTED P(S) = 0.64685 + 0.11481 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 15.791, DEGREES OF FREEDOM = 4, P = 0.0033

NOTE: COMBINING MODE HYPOTHESIZED

TABLE 2a. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY FREESE & COHEN (1973).

CONDITION	ACTOR'S EXPECTATION ADVANTAGE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
(H-L)( )	0.38535	0.7375	0.6826	0.0549
(L-H)( )	-0.38535	0.5687	0.6111	0.0423
( )(HH-LL)	0.69645	0.6969	0.7114	0.0146
( )(LL-HH)	-0.69645	0.5938	0.5822	0.0115
(H-L)(LL-HH)	-0.69645	0.5906	0.5822	0.0084
(L-H)(HH-LL)	0.69645	0.6937	0.7114	0.0177

PREDICTED P(S) = 0.64684 + 0.09275 (EXPECTATION ADVANTAGE)

PEARSON'S CHI-SQUARED = 15.908, DEGREES OF FREEDOM = 4, P = 0.0031

NOTE: BALANCING MODE HYPOTHESIZED

TABLE 11a. OBSERVED AND PREDICTED PROPORTIONS OF STAY-RESPONSES FOR THE EXPERIMENTAL CONDITIONS STUDIED BY FREESE & COHEN (1973)

CONDITION	ACTOR'S EXPECTATION STATE VALUE	OBSERVED P(S)	PREDICTED P(S)	|DISCREPANCY|
(H-L)( )	0.70000	0.7375	0.6720	0.0655
(L-H)( )	0.30000	0.5687	0.6217	0.0529
( )(HH-LL)	1.00000	0.6969	0.7098	0.0129
( )(LL-HH)	0.00000	0.5938	0.5839	0.0099
(H-L)(LL-HH)	0.00000	0.5906	0.5839	0.0067
(L-H)(HH-LL)	1.00000	0.6937	0.7098	0.0160

PREDICTED P(S) = 0.58389 + 0.12590 (EXPECTATION STATE VALUE)

PEARSON'S CHI-SQUARED = 21.761, DEGREES OF FREEDOM = 4, P = 0.0002

NOTE: RESULTS BASED ON HEMBROFF MODEL

NOTES

[1] These research studies are in fact critical in two senses of the word critical. First, they seek to clarify critically important theoretical issues. Second, they report assessments of findings that are to some degree negative for the BFNZ theory.

[2] In all the analyses reported in this article, the parameters of the models are estimated by the method of maximum likelihood, as described by McCullagh and Nelder (1983: Chapter 4). Nominally, the computational algorithm I used requires that experimental trials be statistically independent; however, as McCullagh and Nelder point out (1983: 79), the estimates have desirable statistical properties under much less restrictive assumptions.

[3] I have made one change in the descriptive statistics reported by Freese and Cohen. In their tables (1973: 191), the status-only and performance-only statistics appear to have been interchanged. The difference between the high-status and low-status P(S) values is reported to be .17; that between the high-performance and low-performance P(s) values is reported to be only .10. There are three reasons why I believe this is not correct. First, it contradicts Freese and Cohen´s own theory (1973: 181-186), which states that a performance characteristic is stronger and more generalizable than a diffuse status characteristic (the former being _two_ specific abilities assigned so that the "high" subject is high on both, the "low" subject low on both). Without this assumption, their explanation of their results is invalid, and surely they would have recognized that if the statistics as given were other than a reporting error. Second, Hembroff (1982) carried out a virtual replication of the status-only conditions, finding a P(S) difference of .08. This is close to the .10 of the Freese-Cohen research, but less than half the .17. Third, the descriptive statistics as given are grossly discrepant from the predictions of all three of the models considered in this paper. For the "combining model" (see the discussion in the text), a chi-squared goodness-of-fit test strongly rejects the model ($X^2 = 15.791$, df = 4, $P < .001$); for the "balancing model," the same is true ($X^2 = 15.908$, df = 4, $P < .001$); and for the Hembroff model, the fit is extremely poor ($X^2 = 21.761$, df = 4, $P < .0005$). Detailed summaries of these results are presented in Tables 1a, 2a, and 11a in Appendix B.

Rectifying this apparent transposition does _not_ invalidate Freese and Cohen´s substantive conclusions. On the contrary, it strengthens them. Taken exactly as they are displayed, the Freese-Cohen descriptive statistics present a baffling anomally for all variants of status characteristics theory. Nor does this change have any crucial significance for my argument in this paper, which is that the Freese-Cohen results do not support a balancing hypothesis more strongly than they support a combining hypothesis, a conclusion that is sustained by Tables 1a and 2a, as well as by Tables 1 and 2 (see Appendix B).

[4] The formula for computing the Pearson chi-squared statistic is as follows:

$$X^2 = t \sum_{i=1}^{c} n_i \{(p_i - \pi_i)^2/[\pi_i(1-\pi_i)]\}$$

In this expression, t is the number of critical trials, which is constant across experimental conditions. The summation is across experimental conditions. Terms to the right of the summation operator may differ for different experimental conditions, n being the number of subjects, p the observed P(S) value, and π the P(S) value predicted by the model in question.

[5] Zelditch, Lauderdale, and Stublarec (1980) presented results for conditions 2 and 5 separately for two subsamples of subjects. The corresponding pairs of P(S) values do not differ by a statistically significant amount, and are not predicted to differ by the BFNZ formulation; therefore, for purposes of this analysis, I pooled the subsamples.

[6] Berger (1988), however, suggests that a balancing principle may operate in other kinds of social situations. One hypothesis is that balancing occurs when a person's motivations are primarily social-emotional, as opposed to instrumental. If maintaining a person relationship is primary, successfully accomplishing a task secondary, there may be strong pressures to eliminate information. The maintenance of close personal relationships may be next to impossible unless each person overlooks information threatening or uncomfortable for the other. While the suggested line of research unquestionably is important, this paper considers only situations in which both actors are strongly task-oriented, and in which social-emotional motivations play little or no part (for instance, interactions in juries as opposed to those in families).

[7] Webster presented two sets of results, each involving four experimental conditions. Two conditions in the second set were replications of conditions in the first set. The subject samples differed somewhat between the two sets, but not in ways the BFNZ formulation treats as important. Since the corresponding sets of P(S) values were nearly identical and not predicted to differ by the theory, I pooled the samples for purposes of this analysis.

[8] Hembroff's formula involves the signed strength of a diffuse status characteristic and that of a performance characteristic. Let S denote the signed strength of either characteristic. When the necessary information is available, this is estimated from the formula, $S = (P - N)/(P + N)$, where P denotes the number if elements for which the focal actor is "high," N that for which he or she is "low." (Hembroff's notation is somewhat more involved than this, but the algebra is equivalent.) The absolute strength of a characteristic is the absolute value of the signed strength. Let S_1 denote the signed strength of the characteristic with the greater absolute strength, S_2 that of the characteristic with the lesser absolute strength, whichever those might be. In terms of S_1 and S_2, an actor's *expectation state value* is posited to be:

$$ESV = \tfrac{1}{2} + \tfrac{1}{2}\,[S_1 + (1 - |S_1|)\,S_2]$$

In the case of the relative-age characteristic, Hembroff estimated that $S_{age} = \pm 0.4$ (by a trial-and-error process). In the case of Contrast Sensitivity, he estimated $S_{perf} = (P - N)/(P + N)$, using the numbers of positive and negative results from the tests of subtraits, as specified in the script for the experimental condition in question.

[9] Choosing between their own formulation and the BFNZ formulation clearly is Hembroff's objective. Given the data at hand, this does not seem possible. For the fifteen conditions of the HMS experiment, the rank-order correlation between the two formulations' expectation-state variables, ESV and $e_p - e_o$, is .98, or nearly perfect. Contrary to the impression Hembroff's paper gives, the HMS and BFNZ formulations actually make *identical* rank-order predictions for every one of the pairs appearing in that paper's four hypotheses.

[10] The question could be asked: Does this same problem plague tests based upon the overall P(S) values? The answer depends upon the model proposed. For a very flexible class of models, however, the answer is *no*. Let $\phi(E)$ denote a strictly increasing function of the focal actor's expectation-state value, scaled so that its range is in the interval, zero to one. Let $q(t,\delta)$ be a function of whatever temporal factors operate in the experiment (anxiety, fatigue, etc.), constructed so that, if $\delta = 0$, $q(t,\delta) = 1$. In words, δ is a parameter, or vector of parameters, that indexes the effects of temporal factors; and $q(t,\delta)$ is a conception of how those effects combine and impact upon response probabilities. A class of models that can be called "proportional switching-rates models" is defined as follows:

$$\alpha = P(C_{t+1}|S_t) = q(t,\delta)[1-\phi(E)]$$

$$\pi = P(S_{t+1}|C_t) = q(t,\delta)[\phi(E)]$$

For this class of models, the Sell-Freese "derivative" and the overall probability of a stay-response are as follows (regarding the latter, see Kemeny and Snell 1960: 94):

$$\Gamma = q(t,\delta)[2\ \phi(E) - 1]$$

$$P(S) = \phi(E)$$

The Sell-Freese derivative is a function of <u>both</u> E and δ, whereas P(S) is a strictly increasing function of E, having no dependence on δ. To assess hypotheses about status-organizing processes, the latter provides a clear and compelling basis; the former depends upon temporal effects neither fully understood nor at issue.

[11] The model does not adequately fit the entire set of fifteen conditions. If subtraits of Contrast Sensitivity are treated as separate specific status characteristics, following Hembroff (1982), we find $X^2 = 40.131$, df = 13, $P < .001$. These are the results reported in Table 13. If Contrast Sensitivity is treated as a single specific status characteristic, operationalized by different numbers of tests in different experimental conditions (cf. Fisek <u>et al</u>. 1989), we find $X^2 = 52.235$, df = 13, $P < .0005$. In both analyses, the discrepancies of fit are due to the inclusion of experimental conditions for which there are logical inconsistencies in the performance information given the subjects. Concerning these, the $CR \geq 0.4$ criterion is certainly a rather lenient criterion; but the results presented in Table 14 show that the use of even this very lenient criterion greatly improves the fit of the BFNZ formulation.

[12] Notably, the distinction between diffuse and specific status characteristics plays no part at all in the computation of an actor's expectation advantage (see the Appendix to this paper). Formally, all that matters is the lengths of the paths connecting the focal actor, the characteristics, and the task outcomes. The types of characteristics implicated in those paths are not important. It should be added, however, that the distinction between diffuse and specific status characteristics does play an important part in certain extentions of the BFNZ formulation (see Ridgeway and Berger 1986; Ridgeway 1988).

[13] In the BFNZ formulation, <u>salience</u> is a theoretical state, that is, a state that occurs under conditions specified by the theory. In general, it is <u>not</u> equivalent to a state of perception or awareness. *Because the subjects in an experiment <u>perceive</u> a status characteristic does <u>not</u> automatically make that characteristic salient and thus a basis for their subsequent interaction.* Indeed, one unobvious implication of the BFNZ formulation, which contradicts claims found in some of the

literature on "experimenter effects" (see, for instance, Rosenthal and Jacobson 1968), is that the subjects in an experiment do not necessarily incorporate cues from the experimenter into their behavior, even if the experimenter plainly seems to want them to. The results of Martin and Sell's study provide an excellent illustration of this point.

[14] The theory of status validation has not been discussed in detail because it yields only ordinal predictions; and these do not, as far as I can determine, differ from the ordinal predictions of the BFNZ formulation for any of the situations that have been studied.

The authors propose that when a specific and a diffuse status characteristic are salient in a situation, and when their evaluations provide consistent rank-orderings of the actors in that situation, the differences on the specific characteristic serve to validate the stereotypes associated with the diffuse characteristic. The behavioral predictions Knottnerus and Greenstein adduce from this reasoning are also predictions of the BFNZ theory; and, as the results presented in Table 6 show, the stronger metric predictions of the latter, as well as the shared ordinal predictions, are strongly supported by Knottnerus and Greenstein's experimental results.

Knottnerus and Greenstein's theory raises a number of interesting questions about changes in expectations over a sequence of tasks. Such questions are extremely important for applications of the theory to the problem of reducing gender, racial, or age discrimination. A recent extension of the BFNZ formulation to sequences of tasks is described in Berger *et al*. (1989). Here, as in the applications dealt with in this paper, Knottnerus and Greenstein's work, while provocative, is superceded by the BFNZ formulation and its straightforward extensions.

REFERENCES

Bales, Robert F. 1953. "The Equilibrium Problem in Small Groups" Pp. 111-161 in Working Papers in the Theory of Action, Talcott Parsons, Robert Freed Bales, and Edward Shils (eds.). New York: Free Press.

Benoit-Smullyan, E. 1944. "Status, Status Types, and Status Interrelationships." American Sociological Review 9: 151-61.

Berger, Joseph. 1958. "Relations Between Performance, Rewards, and Action-Opportunities in Small Groups." Unpublished Ph.D. Dissertation. Department of Sociology. Harvard University.

Berger, Joseph. 1988. "Directions in Expectation-States Research." Pp. 450-474 in Status Generalization: New Theories and Research, Murray Webster, Jr., and Martha Foschi (eds.). Stanford: Stanford University Press.

Berger, Joseph, Bernard P. Cohen, and Morris Zelditch, Jr. 1966. "Status Characteristics and Expectation States." Pp. 29-46 in Sociological Theories in Progress, Vol. 1, Joseph Berger, Morris Zelditch, Jr., and Bo Anderson (eds.). Boston: Houghton Mifflin.

Berger, Joseph, Bernard P. Cohen, and Morris Zelditch, Jr. 1972. "Status Characteristics and Social Interaction." American

Sociological Review 37: 241-255.

Berger, Joseph, and Thomas L. Conner. 1969. "Performance Expectations and Behavior in Small Groups." Acta Sociologica 12: 186-197.

Berger, Joseph, and M. Hamit Fisek. 1974. "A Generalization of the Theory of Status Characteristics and Expectation States." Pp. 163-205 in Expectation States Theory: A Theoretical Research Program, Joseph Berger, Thomas L. Conner, and M. Hamit Fisek (eds.). Cambridge, Massachusetts: Winthrop.

Berger, Joseph, M. Hamit Fisek, and Paul V. Crosbie. 1970. "Multi-Characteristic Status Situations and the Determination of Power-and-Prestige Orders." Technical Report Number 35. Laboratory for Social Research. Stanford University.

Berger, Joseph, M. Hamit Fisek, Robert Z. Norman, and Morris Zelditch, Jr. 1977. Status Characteristics and Social Interaction: An Expectation-States Approach. New York: Elsevier.

Berger, Joseph, Murray Webster, Jr., Cecilia L. Ridgeway, and Susan J. Rosenholtz. 1986. "Status Cues, Expectations, and Behaviors." Pp. 1-22 in Advances in Group Processes, Edward J. Lawler (ed.). Greenwich, Connecticut: JAI Press.

Berger, Joseph, Susan J. Rosenholtz, and Morris Zelditch, Jr. 1980. "Status Organizing Processes." Annual Review of Sociology 6: 479-508.

Berger, Joseph, David G. Wagner, and Morris Zelditch, Jr. 1985. "Expectation-States Theory." Pp. 1-72 in Status, Rewards, and Influence, Joseph Berger and Morris Zelditch, Jr. (eds.). San Francisco: Jossey-Bass.

Berger, Joseph, and Morris Zelditch, Jr. (eds.). Forthcoming. Sociological Theories in Progress, Vol. 3. Los Angeles: Sage.

Cohen, Elizabeth G., and Susan S. Roper. 1972. "Modification of Interracial Interaction Disability: An Application of Status Characteristics Theory." American Sociological Review 37: 643-657.

Fisek, M. Hamit, Robert Z. Norman, and Max Nelson-Kilger. 1989. "Status Characteristics and Expectation-States Theory: A **Priori** Model Parameters and a Test." Working Paper 1989-5. Center for Sociological Research. Stanford University.

Fox, John, and James C. Moore, Jr. 1979. "Status Characteristics and Expectation States: Fitting and Testing a Recent Model." Social Pyschology Quarterly 42: 126-34.

Freese, Lee. 1974. "Conditions for Status Inequality in Informal Task Groups." Sociometry 37: 174-188.

Freese, Lee. 1976. "The Generalization of Specific Performance Expectations." Sociometry 39: 194-200.

Freese, Lee, and Bernard P. Cohen. 1973. "Eliminating Status Generalization." Sociometry 36: 177-193.

Geschwender, James A. 1967. "Continuities in Theories of Status Consistency and Cognitive Dissonance." Social Forces 46: 160-71.

Greenstein, Theodore N., and J. David Knottnerus. 1980.

"The Effect of Differential Evaluations on Status Generalization." Social Psychology Quarterly 43: 147-154.

Hembroff, Larry Alan. 1978. "Inconsistent Performance Information and the Elimination of Status Generalization." Unpublished Ph.D. Dissertation. Department of Sociology. Washington State University.

Hembroff, Larry A. 1982. "Resolving Status Inconsistency: An Expectation-States Theory and Test." Social Forces 61: 183-205.

Hembroff, Larry A., Michael W. Martin, and Jane Sell. 1981. "Total Performance Inconsistency and Status Generalization: An Expectation-States Formulation." Sociological Quarterly 22: 421-430.

Hughes, Everett C. 1945. "Dilemmas and Contradictions of Status." American Journal of Sociology 50: 353-59.

Kemeny, John G., and J. Laurie Snell. 1960. Finite Markov Chains. Princeton, New Jersey: Van Nostrand.

Knottnerus, J. David, and Theodore N. Greenstein. 1981. "Status and Performance Characteristics in Social Interaction: A Theory of Status Validation." Social Psychology Quarterly 44: 338-349.

Lenski, Gerhard. 1954. "Status Crystalization: A Non-Vertical Dimension of Social Status." American Sociological Review 19: 405-13.

McCullagh, Peter, and John A. Nelder. 1983. Generalized Linear Models. London: Chapman and Hall.

Martin, Michael W., and Jane Sell. 1980. "The Marginal Utility of Information: Its Effect Upon Decision-Making." Sociological Quarterly 21: 233-244.

Martin, Michael W., and Jane Sell. 1985. "The Effect of Equating Status Characteristics on the Generalization Process." Social Psychology Quarterly 48: 178-182.

Morrison, Donald F. 1976. Multivariate Statistical Methods (Second Edition). New York: McGraw-Hill.

Rainwater, Julie, Max Nelson-Kilger, and Jacqueline Cashen. 1988. "Developing an Open Interaction Experimental Situation." Pp. 413-429 in Status Generalization: New Theory and Research, Murray Webster, Jr., and Martha Foschi (eds.). Stanford: Stanford University Press.

Ridgeway, Cecilia L. 1987. "Nonverbal Behavior, Dominance, and the Basis of Status in Task Groups." American Sociological Review 52: 683-694.

Ridgeway, Cecilia L. 1988. "Gender Differences in Task Groups: A Status and Legitimacy Account." Pp. 188-206 in Status Generalization: New Theory and Research, Murray Webster, Jr., and Martha Foschi (eds.). Stanford: Stanford University Press.

Ridgeway, Cecilia L., and Joseph Berger. 1986. "Expectations, Legitimation, and Dominance Behavior in Task Groups." American Sociological Review 51: 603-617.

Ridgeway, Cecilia L., and David Deikema. 1989. "Dominance and Collective Hierarchy Formation in Male and Female Task Groups." American Sociological Review 54: 79-93.

Rosenthal, Robert, and Lenore Jacobson. 1968. Pygmalion in the Classroom. New York: Holt, Rinehart and Winston.

Sell, Jane, and Lee Freese. 1977. "Aspects of the Decision Process for Halo Phenomena." Paper presented at the annual meetings of the American Sociological Association.

Sell, Jane, and Lee Freese. 1984. "The Process of Eliminating Status Generalization." Social Forces 63: 538-554.

Skvoretz, John. 1981. "Extending Expectation-States Theory: Comparative Status Models of Participation in N-Person Groups." Social Forces 59: 752-770.

Wagner, David G., and Joseph Berger. 1985. "Do Sociological Theories Grow?" American Journal of Sociology 90: 697-728.

Wagner, David G., and Rebecca S. Ford. 1983. "Confirming and Disconfirming Performance Expectations." Paper presented at the West Coast Conference on Small Groups Research, San Jose, California (April 1983).

Weber, Max. 1947 [originally 1922]. The Theory of Social and Economic Organization. Translated by A. M. Henderson and Talcott Parsons. New York: The Free Press.

Webster, Murray, Jr. 1977. "Equating Characteristics and Social Interaction: Two Experiments." Sociometry 40: 41-50.

Webster, Murray, Jr., and James E. Driskell, Jr. 1978. "Status Generalization: A Review and Some New Data." American Sociological Review 43: 220-236.

Webster, Murray, Jr., and Martha Foschi (eds.). 1988. Status Generalization: New Theory and Research. Stanford:

Stanford University Press.

Zelditch, Morris, Jr., and Bo Anderson. 1966. "On the Balance of a Set of Ranks." In _Sociological Theories in Progress_, Vol. 1, edited by Joseph Berger, Morris Zelditch, Jr., and Bo Anderson. Boston: Houghton-Mifflin.

Zelditch, Morris, Jr., Patrick Lauderdale, and Steven Stublarec. 1980. "How Are Inconsistencies Between Status and Ability Resolved?" _Social Forces_ 58: 1025-43.