

NONPARAMETRIC FACTOR ANALYSIS OF PERSONALITY THEORIES

GEORGE A. KELLY

Ohio State University

N. L. Farberow and E. S. Shneidman (2) have recently published a book in which eight different personality theorists deal with the clinical problem of suicide. In order to focalize the points of theoretical similarity and difference the authors presented to each theorist-clinician the summary of a protocol prepared by N. D. Tabachnick, psychiatrist. The protocol was a summarized report of a series of anamnestic interviews with Mr. A. S., a 23 year old man who had made a serious attempt at suicide. The contributors were asked to expound their systematic positions with respect to suicide in general and then to make a blind analysis of the protocol summary. In addition, the participants were given a set of 76 cards on each of which appeared a different statement that might or might not be judged as applicable to the patient. They were then asked to Q-sort the statements into a format normally distributed into nine categories. Six participants replied to this request. A few illustrative items are reproduced in Table 1.

One of the theorists, H. L. Ansbacher, has raised the question of what a factor analysis may reveal about the relationships between the clinical judgments. Do Q-sorts applied to a particular case throw light on the differences between the clinical implications of various theories? This information of itself would be of considerable psychological interest, since recent studies have raised doubt as to whether the theoretical orientations of experienced clinicians actually make any difference in the way they go about handling their cases.

But there is also another intriguing possibility. If we put our minds to it, we may be able to contrive some new and discriminating device for bringing to light the essential likenesses and differences among any given set of theories. That also seems worth trying.

Now let us see what we can do with these two possibilities. Suppose we start with Farberow and Shneidman's intercorrelations between the Q-sort data they obtained. These are shown in Table 2. Upon a suggestion by Ansbacher, Harold Gulliksen in discussion with Sam Messick and Henrietta Gallagher computed a parametric factor analysis of the data. His factor loadings and communalities are shown in Table 3.

TABLE 1. ILLUSTRATIVE ITEMS FROM THE Q-SORT DECK AND THEIR RATINGS BY SIX THEORETICIANS
(1 INDICATING MOST, 9, LEAST CHARACTERISTIC OF THE SUBJECT).^a

No.	Item	Theoreticians' ratings					Dia. ^b
		Fut.	Klo.	Ans.	Gre.	Kel.	
1.	He likes and seeks the companionship of others.	4	2	3	3	2	3
2.	He usually withdraws in social situations.	2	6	5	4	6	4
3.	He is obviously uncomfortable in his contacts with authority.	4	3	6	5	5	1
4.	He gives in immediately when attacked.	6	4	5	4	6	7
5.	He seems to adapt to his environment quite well.	6	5	6	5	7	8
6.	Nearly all his interpersonal relationships are superficial.	2	7	4	3	1	4
7.	He meets aggression from others with counter-aggression.	9	5	5	8	3	5
8.	He has very few friends.	4	4	2	3	3	3
9.	He blames himself when criticized.	1	3	4	3	5	5
10.	He has difficulty in relating to people.	4	5	5	4	3	1
16.	He is rather cold and impersonal in his interactions with women.	5	8	7	5	5	2
17.	He goes out of his way to please people.	6	1	6	2	5	3
20.	He tends to retreat from the stress and strain of everyday living.	7	5	1	3	1	3
31.	He retreats when other people become aggressive toward him.	3	4	3	4	6	5
39.	He faces unpleasant situations in a direct manner.	5	7	9	7	9	7
46.	His relations with mother figures are fairly happy.	9	4	3	7	2	5
72.	He adapts fairly easily to authority demands.	7	3	2	4	4	9
74.	He is rather neutral toward others.	4	6	4	5	5	6

^aFrom *The cry for help*, by N. L. Farberow & E. S. Shneidman (Eds.), pp. 307-310. Copyright 1961. McGraw-Hill Book Company, Inc. Used by permission.

^bSamuel Futterman, Bruno Klopfer, Heinz L. Ansbacher, Maurice R. Green, George A. Kelly, Solomon Diamond.

TABLE 2. INTERCORRELATIONS BETWEEN THEORETICIANS ON Q-SORTS FOR MR. A. S.^a

	Futterman	Klopfcr	Ansbacher	Green	Kelly	Diamond
Futterman		.21	.21	.38	.06	.23
Klopfcr			.48	.33	.16	.13
Ansbacher				.53	.56	.28
Green					.38	.33
Kelly						.50
Diamond						

^aFrom *The cry for help*, by N. L. Farberow & E. S. Shneidman (Eds.), p. 312. Copyright 1961. McGraw-Hill Book Company, Inc. Used by permission.

TABLE 3. CONVENTIONAL FACTOR ANALYSIS OF THEORETICAL DIFFERENCES^a

Clinician	Theory	Factor loadings			h ² 3f
		1	2	3	
Futterman	Freudian	.38	-.37	.38	.43
Klopfcr	Jungian	.48	-.33	-.23	.39
Ansbacher	Adlerian	.79	-.06	-.32	.74
Green	Sullivanian	.68	-.19	.11	.51
Kelly	Personal construct	.69	.47	-.04	.71
Diamond	Nondirective	.54	.27	.32	.46

^aFrom personal communication by Harold Gulliksen to H. L. Ansbacher.

INFORMATION PROVIDED BY FACTOR ANALYSIS

It is to be noted that Gulliksen's factorial composition of three factors is anchored in terms of theoreticians. If we are sure we know what the theoreticians stand for, we can make an educated guess as to what the factors represent. But suppose whatever the theoreticians stand for is precisely what we want to find out. In this case our guess will not be so educated, though we can make some secondary inferences from the net of inter-relationships represented by the factors.

An alternative approach would have been to anchor the factorial construction in terms of items. But in this case we tend to lose track of the theories. Whether, in the final analysis, such an alternative approach would yield any meaning not produced by the standard approach is a matter of some difference of opinion among factor analysts, though it seems to me that in a problem of this sort the two methods do permit one to make inferences which supplement each other.

Questions One Is Bound to Ask

In either case certain basic questions arise to plague the person who wants to know something about the practical implications of theories. If the factors are expressed in terms of theoreticians only, how can that tell us anything about the substance of the agreements and disagreements? On the other hand, if the factors are expressed in terms of items only, how will we know what the analysis has to do with theories?

While we are at it, let us ask some other questions, too. Can one ascribe meaningful names to the three factors produced by Gulliksen, and are there ways, other than name calling, to ascribe meaning to them? Are there alternative methods of mathematical treatment which might provide us with a better understanding of Mr. A. S., or of the clinical differences between the six theoreticians? To what extent can we generalize about the operational differences between clinicians or about the differences between theories when only one target case is involved? Are Farberow and Shneidman's items of such a nature as to explicate the full range of theoretical differences?

Then there are those cases in which the clinician has difficulty applying a categorical statement to the patient in the face of a history of contrasting or gradually shifting behaviors. For example, in the case of Mr. A. S. there is a report of numerous childhood fights, yet he describes his avoidance, as an adult, of interpersonal conflicts he felt he could not win. In the light of such a report how does one come out with a flat statement that he either was or was not inclined to give in immediately when attacked (Item 4)? Obviously this kind of difficulty is inherent in the application of any kind of trait theory, as well as in outright typology.

There are also some basic issues, such as those that always puzzle one when he attempts to understand persons from the way in which they cope with prefabricated propositions. For example, some clinicians use the terms "hostility" and "aggression" practically synonymously, while others see a vast difference in what is implied by the two terms. This is more than a matter of mere semantics; it has to do with dispositional patterns in the ways human behavior is perceived—quite apart from differences in the technical usage of terms. Is there any way to surmount this discrepancy, or must one retreat into pure phenomenology?

A glance at some of the differences in theoreticians' judgments serves to indicate how complex a matter it is to use the Q-sort items to

spell out the substance of theoretical distinctions. For example, Ansbacher and Kelly assign the highest rating to the statement, "He tends to retreat from the stress and strain of everyday living" (Item 20), yet Futterman rates this statement at 7, indicating that he believes it is significantly untrue of the patient. But on Item 31 Futterman and Ansbacher agree that "He retreats when people become aggressive toward him," while Kelly is inclined to disagree. Here is an instance in which theoreticians not only disagree with each other, but two of them may appear to be disagreeing with themselves.

We could, of course, say that there is an "error factor" operating here. But there is also the likelihood that the three men have different notions about the nature of retreat, of stress and strain, and of aggressiveness. Can we then say that the pattern of differences in judgment reflect theory-based differences in the way the patient is seen, or do they reflect theory-based differences in the way the terms are seen?

There is another intriguing point. The factorial pattern produced by Gulliksen's analysis would likely have been substantially different if Herbert Hendin, who commented on the protocol from a modified Freudian point of view, and Louis E. De Rosis, who takes the Horney point of view, also had done the Q-sorts. Now what shall we say has happened to meaning? Isn't it a little silly to argue that what is basic to Futterman and Klopfer changes when data from Hendin and De Rosis snuggle up alongside it? To draw such a conclusion would be to let gnosiological relativism run wild. It must be obvious, therefore, that factor analysis does not produce what is commonly understood to be substantive meaning. At least, it fails to do so in this kind of matrix.

What Dependable Meanings Emerge?

What kind of meaning referents, then, does this factor analysis erect? First of all, it tells us something holistically about the particular pool of judgments coming from the six theoreticians. But it tells us nothing absolute about the men—only how their judgments are related to the pool. Following the logic of Thurstone (6), it is simply an economical way of representing the complex array of data provided by the six sets of Q-sorts.

It is always a little disappointing to be frustrated in our search for the absolute. Yet as long as we live in a world where we are dependent on partial or transient systems of knowledge, we must understand things in terms of their similarities and contrasts with other things, and with constellations of other things.

Still, it is worth something to know that the factorial description of the pool of information does throw some light on the inter-individual differences of opinion. Consider Gulliksen's third factor, for example. Evidently it would be economical to say that there is a constellation of issues at stake in the Q-sorted data which pits Futterman and Diamond against Ansbacher and Klopfer and leaves Green and Kelly in the middle. Since this is a parametric factor analysis it does not say that this set of issues is one in which Futterman and Diamond say something is true and important in the case of Mr. A. S. while Ansbacher and Klopfer merely say it is unimportant or only half true and half untrue. As far as the factorial information is concerned, it might be that it is a case of Futterman and Diamond taking the ho-hum stand, with Ansbacher and Klopfer making a Federal case out of it. Yet, it is interesting to know there is some scalar alignment to be envisioned among the clinicians, and it may help one guess what one theory involves from his prior knowledge of what some of the others involve. But it remains for him to guess just what that may be.

Some additional meaning is provided by the communality values (h^2) in Table 3. With the factorial composition developed along these particular lines, it occurs that varying amounts of individual communality are "explained." Again, this gives us no particular insight into the unique meanings of the six theoretical systems, but rather indicates only the comparative extent to which the three-factor system has drawn upon each of the six sets of Q-sort information.

The Minimax Problem Posed by Human Limitations

There is a more general way in which the function of factor analysis can be stated. Factor analysis provides one kind of answer to a minimax problem—how to encompass the maximum amount of information within the minimum number of parameters. The problem can also be stated as one of minimizing the differences between small units, such as test items, while maximizing the differences between large units, such as factorial constellations. How small and multiplex the items must be before it becomes desirable to minimize their differences, and how large and sweeping the factors can become before they become top-heavy with overgeneralizations, is basically dependent on something else—the limitations and capacities of the human mind, or of particular human minds.

If one could think in terms of 76 dimensions at once, there would be no point in factor analyzing the Q-sort data in Farberow and

Shneidman's book. On the other hand, if one's thinking about personality matters is limited to one dimension, the three factors produced by the analysis will still leave him confused by the complexity of the information at hand. Points such as these were ably made by T. L. Kelley in his volume on factor analysis (4), published in 1935, incidentally within a few weeks of L. L. Thurstone's classic work (6), dealing with the same subject. T. L. Kelley had mentioned the point, though less lucidly, in 1928 (3).

Conforming to Pre-cast Structure

Beyond the minimax problem of producing a manageable compromise between the simplification and proliferation of information, there is the problem of bringing the information into alignment with the construct systems of those who are expected to understand it. Suppose a theoretician could think in 76 directions at once—or even three directions, for that matter—it does not follow that he can think clearly in line with the particular 76 constructs involved in the deck of Q-sort items, or the three constellated constructs represented by Gulliksen's factor pattern.

Nevertheless, the factor analysis may enable him to bring the information into alignment with the dimensions of his own personal system in two ways. First, an examination of the items comprised by one of the factors in an "inverted" factor analysis and the pattern of a factor's loadings on the six clinicians in a "conventional" factor analysis may give him some faint clues as to which constructs selected out of his own repertory may be appropriately invoked. Second, a successive reading of the items and a continued examination of the pattern of factor loadings may enable him to do some fresh abstracting on his own. If so, he can be expected to add suitable constructs to his own personal repertory, constructs that he may, with a little practice, be able to generalize beyond the fragments of data at hand.

It is in these respects that factor analysis has conceptual utility as an instrument for bringing information within man's reach, even though it does not uncover natural meanings or of itself create ideas.

THEORETICAL RESTRICTIONS OF THE DATA

Before proceeding to the description of our nonparametric approach to this problem, it is appropriate to take account of other kinds of limitation in the data. If one examines the items of the Q-sort deck, he will note a certain similarity running through most of

them. Nearly all the items have to do with interpersonal relations. Such items tend to have the advantage of being more directly related to observable behavior than are more abstract or "psychodynamic" items. But they do limit the diversity of the clinicians' responses. Furthermore, it may occur that a particular type of item may be in closer alignment with the terms of reference of some personality theories than with the terminology of others. The Adlerian and Sullivanian systems, for example, tend to place considerable emphasis upon interpersonal relations, while the Freudian system reduces its observations to a considerably different set of terms. This may mean that Ansbacher and Green, who represented the Adlerian and Sullivanian systems, might have been able to make more complete statements of their positions in terms of the Q-sorts than was Futterman, who represented the Freudian system.

Adding Other Types of Items

It would be possible, of course, to add other types of items to the Q-sort deck, and thus provide for a more complete explication of some of the theoretical viewpoints. One would have to do his best to keep the new items within a common clinical language. For example, suppose he introduces an item having to do with the patient's use of the "conversion mechanism." While the item might make sense to a Freudian and provide him with a terminological framework in which he could express his appraisal of the case more fully, it might, at the same time, introduce a meaningless complication to the nondirectivist, in whose system such a term is likely to be peripheral, if not ambiguous.

There are down-to-earth practical items, however, that represent issues likely to be faced by any clinician, regardless of his conceptual network. An examination of what the different clinicians have said about Mr. A. S.'s treatment suggests a number of such common issues. For example, one item might be, "He will respond best if some form of psychotherapy is started immediately rather than being delayed," or another might be, "He is subject to wide and unpredictable mood swings."

Theoretical Restrictions of the Protocol

There is another respect—unavoidable—in which instrumentation of this study bears unequally on the different theoretical positions. The protocol itself, upon which the different theoreticians had

to base their assessments, cannot be considered as theoretically sterile. While Tabachnick, who elicited the protocol, is to be congratulated for his consistent efforts to avoid theoretical bias, it is clear that one's outlook determines what kind of relationship he will establish with the patient, what questions he will ask, what observations he will be alert enough to make, which ones he will consider important enough to report, and how he will paraphrase what the patient has said. For example, this writer, in reading the protocol summary preliminary to making his appraisal, was struck with the congruency between what was reported and what an Adlerian theoretician would probably consider to be important. This was what led to his comments on the style-of-life paradigm (2, p. 259). This is not to say that the interviewing clinician was careless or that he was an Adlerian; it is to say, rather, that he had to be *something* and evidently he sensed this particular perspective as closest to the unvarnished facts. What neither he nor any other clinician can escape is the tendency for facts to come into focus only in the light of prior personal assumptions—assumptions that are theoretically either explicit or implicit in the practical way one looks at things.

The Patient's Theoretical Orientation

But we must recognize that there were other theoretical impulses at work here. As we have already suggested, there is a theoretical commitment underlying the Q-sort items, and there is the commitment of the clinician who elicited the protocol—one without which he would have been unable to make any clinical contact with the patient. Beyond these there is the commitment of the patient. His outlook had something to do with the kind of relationship he was prepared to establish with the interviewer, the questions he must have asked or avoided asking, those he chose to answer and how he chose to interpret them, what he remembered, what he considered important enough to report, and how he put his observations into the formal language of words. No matter how clever the rest of us may be, it was this fellow's deeply engrained theory that structured the field, not merely as to what was produced in the protocol, but as to the very course of the events in his own turbulent life.

Limitations in Format

This brings us to the last of the possible built-in biases which might have made some theoreticians more comfortable with the proto-

col than were others. Tabachnick, in his effort to make his report as theoretically sterile as possible, on occasion quite properly fell back upon direct quotations from Mr. A. S. This produced the kind of protocol to which personal construct theory, with its emphasis on the personal constructions of the patient, and nondirectivism, with its empathic emphasis upon acceptance of expressed feelings, both tend to give considerable credence. Freudians, however, are not so likely to take such initial statements at face value. During the early stages of therapy they depend, instead, on what they consider to be more subtle cues to underlying mechanisms, many of which are not communicated by a literal transcription of what the patient has said. The Jungian also is inclined to discount such literal transcriptions.

These relationships between direct quotations in the anamnesis and the different theoretical positions of the clinicians do not suggest that the personal construct theorist and the nondirectivist could do a better job of interpreting the quotations. It suggests only that they may have been more comfortable with such information and hence possibly better able to use it to stabilize their conclusions, such as they were. On the other hand, Tabachnick's choice of statements worth quoting appears to be more in line with the sort of thing that would make a psychoanalyst prick up his ears, and somewhat less in line with what would alert the personal construct theorist and nondirectivist.

There are, therefore, many interesting technical and adventitious relations between the patient and the theoreticians, the items of the Q-sort, and the protocol, as well as theoretical divergencies among them. It would be difficult, indeed, to determine from the data whether one of the systematic points of view is more comprehensive in its general logical form or more precise in its particular application to this case than are the others. What the data may reveal, however—and this is of importance—is something about the issues at stake between the different theories. But to bring these issues into focus we shall need to employ a different mathematical approach.

NONPARAMETRIC APPROACH

Consider an item in the Q-sort series such as No. 72, "He adapts fairly easily to authority demands," on which there is considerable difference of opinion among the six clinicians. (See Table 1.) Ansbacher and Klopfer agree this statement significantly describes Mr. A. S., the former rating it 2, that is, one of the eight most applicable

statements, and the latter rating it a 3, one of the 18 most applicable statements. But Diamond rates this item a 9, one of the three most inapplicable statements, and Futterman tends to agree with him, rating it a 7, one of the 18 most inapplicable statements. Green and Kelly give it an intermediate rating of 4, only one of the 30 applicable statements.

Interpretation of Data in the Intermediate Range

Perhaps Green and Kelly saw Mr. A. S. as being near normal in this matter, or so mixed in his responses to authority demands that no clear-cut statement could be made. Or perhaps the statement seemed so ambiguous to them that they could do no better than assign it an intermediate position, hoping thus to avoid committing themselves. There is the further possibility that one or both of them considered the statement true enough, but not of sufficient clinical importance to place it among the items they were required to select as best describing the psychological structure of the case. Finally, they may simply have considered the item irrelevant. So what shall we say their intermediate ratings mean?

This problem of interpreting intermediate range data is always perplexing. Looking at the problem psychologically, this writer is inclined toward the use of dichotomous constructions, with all items omitted, rather than assigned an intermediate scalar value, when they cannot be clearly identified with one construct pole or the other. If, for some reason, Q-sorts in more than two categories do have to be made, then at least it might be better to specify that they conform to a U-shaped distribution rather than to a Gaussian curve. This matter has been discussed by the writer elsewhere (5, p. 144) and Cromwell and Caldwell (1) have produced experimental evidence indicating the relationship between a U-shaped distribution and personally relevant meaning. But all of this has to do with a set of issues which cannot be treated at length here.

Equivalent Patterns

To come back to our present data, we have, with respect to the ratings on Item 72, a pattern of differences between the theoreticians, with Ansbacher and Klopfer pitted against Diamond and Futterman, while Green and Kelly straddle the fence.

Now if we examine the ratings on Item 16, "He is rather cold and impersonal in his interactions with women," we will note a somewhat

similar pattern. Ansbacher, who rates it a 7, and Klopfer, who rates it an 8, are still pitted against Diamond, who gives it a 2, though Futterman, the Freudian, has deserted his erstwhile nondirectivist colleague and joined Green and Kelly on the fence, all 5's. Still, except for the reversal of ratings, the two items reflect about the same pattern of disagreement between the theoreticians. Can we say, therefore, there is a common factor underlying the two patterns?

This is a tricky question. If we say the items share a common denominator, we must be careful to imply only that they provide grounds for a similar pattern of practical disagreement between theoreticians, and not that the substance of the two items is necessarily similar. But this pattern of disagreement—and agreement—narrows down our search for the substance of theoretical differences. We may, therefore, profitably delineate the pattern further by searching for other items where it is manifested.

Parametric versus Nonparametric Factors

But suppose, instead of inquiring specifically about the pattern we have observed in Items 16 and 72, we ask a more general question. Suppose we ask ourselves if there is a pattern—any pattern—of agreement and disagreement between the theoreticians that is commonly reflected in a considerable number of items. That is to say, let us look for big things first, whatever they may be.

We can ask this question in two ways; we can ask if there is such a pattern that occurs regardless of the absolute ratings given by the theoreticians, or we can consider certain absolute ratings and ask which items conform closely to them. The first procedure involves a parametric factor analysis. Thus, if one item yielded a pattern of ratings of 1, 2, 3, 4, 5, and 6, respectively, for the six theoreticians, it would be parametrically the same as another item which yielded a pattern of 4, 5, 6, 7, 8, and 9, respectively, for the same theoreticians. The ordinal sequences being the same, the factorial composition would be considered parametrically identical.

The second approach involves a nonparametric analysis, and the two item patterns would be considered identical only if they disclosed exactly the same cardinal ratings by the respective theoreticians.

Most factor analytic methods are based on the parametric approach, but when it is desirable to find relationships which will permit the prediction of the absolute ratings of one particular item from the

ratings assigned to another, a nonparametric approach is preferable. The writer has elsewhere proposed a nonparametric approach to the factor analysis of dichotomous personal constructions of events (5). While there are certain inherent difficulties in such an analysis, some of which have been pointed out, the more common criticisms of the method have been based on the mistaken assumption that a factor must always be conceived parametrically.

Successive Approximations: First Trial

Let us see how a nonparametric method of analysis may be applied to the nine-step ratings in the present problem. Suppose we approach each factor by successive approximations. To start with, we shall be looking for a rating pattern that will match as closely as possible the largest possible number of items, but not one that is so general that it foils our efforts to discriminate theoretical differences. This is to say we must keep our minimax criterion in mind.

Perhaps the most obvious first step would be to determine the mean of each theoretician's ratings. The pattern of means would obviously be the best fit for the total of the items. But each clinician was instructed precisely as to how many ratings of each value he could make and, if he followed his instructions, he would come out with a mean rating of five. A pattern of fives for all six clinicians would then be the best fit for the 76 items and the items which fitted the pattern best would be those given intermediate or neutral values—hardly a very exciting basis for understanding theoretical differences.

In order to locate those items which elicited more extreme judgments, and thus possibly make meaning stand out in greater relief, we can go through all the items with a pattern of fives—a process called “scanning”—to cast out the ones that match such a drab pattern. Item 74 “He is rather neutral toward others,” for example, has a pattern of 4, 6, 4, 5, 5, and 6. Obviously no one crawled very far out on either limb of this statement. Our scanning pattern of all-fives comes within four points of matching it. This is pretty close, so we may tentatively eliminate the item from the pool as not being likely to shed much light on theoretical issues.

Suppose we arbitrarily eliminate from the pool all items whose match with the scanning pattern of all-fives is less than ten points. This leaves us with the items marked with an asterisk(*) in the column headed “ $\Sigma(X-5)$ ” in Table 4. We may now total the ratings for each clinician among these remaining items only. In adding these

TABLE 4. NONPARAMETRIC ANALYSIS OF Q-SORT ITEMS FROM FARBEROW AND SHNEIDMAN
(2, PP. 307-310). ITEMS 21-75 OMITTED

Item no.	Fut.	Theoreticians' ratings				Dia.	$\Sigma(X-5)$	First factor trials				Matching scores		Third factor trials			
		Klo.	Ans.	Gre.	Kel.			I	2	3	4	Second factor trials		I	2	3	
												I	2				
1.	4	2	3	3	2	3	13*	5*	4*	5*	4*		11			12	
2.	2	6	5	4	6	4	7	±17	±12	±11	10	8	5*			-6*	
3.	4	3	6	5	5	1	8	14	11	12	11	13	8*			-9	
4.	6	4	5	4	6	7	6	-14	±11	±10	-9		6			7	
5.	6	5	6	5	7	8	7	-11	-8	-7	-6*		±11			10	
6.	2	7	4	3	1	4	13*	13	10	9	8		±13			-12	
7.	9	5	5	8	3	5	9	-17	±14	±13	-12	-6*	-7*			12	
8.	4	4	2	3	3	3	11*	5*	4*	3*	2**		11			12	
9.	1	3	4	3	5	5	9	13	8	9	8		5			12	
10.	4	5	5	4	3	1	7	12	9	8	7		10			-11	
11.	4	5	5	8	7	4	7	-11	-8	-7	-8		9			-10	
12.	5	4	6	2	5	3	7	9*	8	7	8		9			-10	
13.	4	4	7	7	9	6	11*	-9*	-6*	-5*	-6*		11			-12	
14.	3	8	5	5	5	5	5	-15	-10	-11	±12	-10*	-7*			-6	
15.	4	7	7	7	6	6	9	-8*	-2*	-3*	-4*		-9				
16.	5	8	7	5	5	2	8	-14	-9	-10	-11	-13	-10			-5	
17.	6	1	6	2	5	3	11*	11	10	11	12	10*	11		-9	-7*	-5
18.	2	3	5	5	4	6	7	15	10	11	10	8*	5*		8	±14	8
19.	7	5	6	5	8	8	9	-11	-10	-9	-8		-11			10	
20.	7	5	1	3	1	3	14*	6*	9	8	9		-14			13	
76.	3	5	4	5	2	2	9	11	10	9	8		11			-10	

totals we shall, in effect, reverse some of the items, just as if they had been stated in the opposite way. Take Item 39, "He faces unpleasant situations in a direct manner," with a pattern of 5, 7, 9, 7, 9, and 7, for example. If we consider this item reversed, e.g., "He does *not* face unpleasant situations in a direct manner," the ratings would presumably be 5, 3, 1, 3, 1, and 3. We shall therefore balance the table by aligning all items so that extreme ratings will tend to be represented by low numbers only, rather than by low and high numbers both. This reversal of items, corresponding to "reflection" in conventional factor analysis, is accomplished simply enough if one turns end-for-end all items in which the average rating of the six clinicians is greater than five. The columnar totals are shown in the first row of Table 5 and the average (mean) of each clinician's ratings is shown in the next row beneath.

We may now set up our first trial scanning pattern for Factor One (f_{1t1}). It is derived from the 31 items selected by our casting out the "flat" ones. (See left-hand column, Table 5.) We would, of course, tend to get, though not always, the best total matching score for all the selected items if we scanned with the means in Table 5. But we shall not do this for two reasons. First, such a scanning pattern would require us to tote up fractional amounts, and it seems preferable to keep our task simple by sticking to whole numbers. Second, the pattern is still rather "flat" and we are looking for sharper differences between the clinicians, even if we have to sacrifice some generality our first factor.

In order to increase the possibility of getting sharper differences among the clinicians into our first factor pattern, we shall expand the range of ratings in the pattern. We do this by assigning arbitrarily a rating of 1 to the lowest average (2.8)—appearing in Ansbacher's column—and a rating of 5 to the highest average (4.4)—appearing in Futterman's column. The other expanded values are determined by interpolation, and are rounded to the nearest whole number. The first trial scanning pattern in our search for a first factor (f_{1t1}) produced by this method is shown in the third row of the first panel in Table 5. We shall use this pattern as a first approximation to the first factor, although it is obvious that in subsequent trials we shall have to let the regression effect pull some of the extreme scores (e.g., Ansbacher's artificial 1) down to more moderate values.

The matching value for each item is shown in Table 4, in the first column under "First factor trials," e.g., Item 1 matching this pattern

TABLE 5. SUCCESSIVE APPROXIMATIONS OF FIRST FACTOR

Successive trials		Fut.	Klo.	Theoreticians' ratings			Dia.	Criteria
				Ans.	Gre.	Kel.		
fit ₁ (N = 31)	Totals	137	115	87	97	101	113	$\Sigma (X-5) > 9$
	Means	4.4	3.7	2.8	3.1	3.3	3.6	
	Pattern	5	3	1	2	2	3	
fit ₂ (N = 27)	Totals	128	91	69	78	82	98	fit ₁ < 10
	Means	4.7	3.4	2.6	2.9	3.0	3.6	
	Pattern	5	3	3	3	3	3	
fit ₃ (N = 21)	Totals	102	74	54	71	68	80	fit ₂ < 7
	Means	4.9	3.5	2.6	3.4	3.2	3.8	
	Pattern	5	4	3	3	3	4	
fit ₄ (N = 22)	Totals	97	77	59	72	73	83	fit ₃ < 7
	Means	4.4	3.5	2.7	3.3	3.3	3.8	
	Pattern	4	4	3	3	3	4	
fit ₅ (N = 23)	Totals	98	93	68	77	79	88	fit ₄ < 7
	Means	4.3	4.0	3.0	3.3	3.4	3.7	
	Pattern	4	4	3	3	3	4	
F ₁								
Gulliksen's F ₁ loadings		.38	.48	.79	.68	.69	.54	

with a value of 5. In this column where the match is better—lower matching score—for the item when it is reflected, the score is shown as a negative number, e.g., Item 4). In some cases the match is the same for the item when it is reflected as when it is not. In such a case, e.g., Item 2, the score is preceded by \pm .

We shall apply this first trial scanning pattern to all items, including those we temporarily eliminated from the pool. The lower the matching score shown in the column, the closer the item matches the trial scanning pattern. From these lower matching scores we may determine which items show promise of fitting together to shape up our first factor. Suppose we say, somewhat arbitrarily to be sure, that any item shows promise when its ratings average one and a half points or less from the ratings in the scanning pattern. These would be the items with a value of less than ten in the column. They are marked with an asterisk (*) in Table 4. There are 27 of them, and that fact is noted at the left of the second panel in Table 5. Our new criterion for selecting the items from which to derive the second scanning pattern—a matching score of less than 10 when scanned with the preceding pattern—is noted in the right hand column of Table 5 ($f_{1t1} < 10$). Our "criterion" column in this table also indicates that we have dropped our initial requirement, applied only in the derivation of the first trial pattern, that items not match the all-fives pattern too closely.

Scanning with the Second Trial Pattern

Now suppose we add each theoretician's ratings of the starred items only, taking care to use reflected values for items whose matching scores for f_{1t1} were negative. The totals and means are shown in the second panel of Table 5. These new values, when rounded, constitute the second trial scanning pattern, f_{1t2} . The item-by-item matching values obtained with this trial pattern are shown in the second column under "First factor trials," in Table 4.

Now suppose we tighten up our criterion of what we shall consider a promising item. Suppose we limit ourselves to those items with matching scores of six or less in the f_{1t2} column. The theoretician totals and averages are shown in the next panel of Table 5, as before. From the rounded averages the third trial pattern emerges, f_{1t3} . It is slightly different from the preceding trial pattern, so we shall run it through in a similar fashion, with matching scores shown in the next column in Table 4.

Using the same criterion for a "promising item," $f_{1t3} < 7$, we may proceed to develop additional scanning patterns until the successive approximations come to a standstill. This actually occurs when it turns out that the f_{1t5} rounded scanning pattern turns out to be the same as the preceding f_{1t4} scanning pattern. No Column 5, therefore, is shown in Table 4.

We now have our "first factor." It is shown in the fractional scanning pattern ("Means") in the next to the bottom panel of Table 5, or in the rounded values ("Pattern") in the row beneath. It is also shown in terms of the closely matching items whose matching scores are shown in the fourth column of first factor trials in Table 4. The items which match the scanning pattern best (3 or less) are marked ** and those matching fairly well (6 or less) are marked *. A list of the first factor items, together with their matching scores, appears in Table 6.

TABLE 6. SOME ITEMS IN THE Q-SORTS AND THEIR FACTORIAL ASSIGNMENTS.
FROM FARBEROW AND SHNEIDMAN (2, pp. 307-310)

Item no.	Principal items in order of conformity to factorial scanning pattern	Matching score	Other factor
<i>Composition of first nonparametric factor</i>			
Fut. 4, Klo. 4, Ans. 3, Gre. 3, Kel. 3, Dia. 4 (last pattern, Table 5)			
8.	He has very few friends.	2	
45.	His friendships seem rather stable and have relatively few conflicts.	-2	
53.	Friendly gestures from others arouse his suspicion and hostility.	-3	
1.	He likes and seeks the companionship of others.	4	
15.	He is constantly fighting his environment.	-4	
25.	He becomes quite aggressive in most social situations.	-4	
32.	He competes very strongly with father figures.	-4	
41.	He gets along well with most people.	-4	
51.	He runs away from hostility in others.	4	
22.	He escapes in fantasy when threatened.	5	
24.	He is uneasy and uncomfortable around other men.	5	
29.	He reacts in a hostile and aggressive fashion in his interpersonal contacts.	-5	(F ₂ -6)
55.	He rarely responds to positive gestures from others.	-5	
62.	He responds in a realistic fashion to hostility in others.	-5	
65.	Even the mere presence of other people produces immediate withdrawal in him.	-5	
5.	He seems to adapt to his environment quite well.	-6	
13.	He has quite a few relatively warm interpersonal relationships	-6	
21.	He meets the demands of his environment in a rather reasonable fashion.	-6	
23.	He tries to manipulate those around him to serve his own ends.	6	
26.	He generally feels accepted by others.	-6	

Composition of second nonparametric factor

Fut. 3, Klo. 3, Ans. 5, Gre. 4, Kel. 6, Dia. 5 (last pattern, Table 7)

31. He retreats when people become aggressive toward him.	6	(F ₂ 3)
43. He is quite passive in most of his interpersonal contacts.	6	
73. He becomes negativistic when people show a friendly interest in him.	-6	(F ₃ -6)
31. He retreats when people become aggressive toward him.	3	(F ₁ 6)
57. When others show an interest in him, he immediately becomes aggressive and demanding.	-3	
35. He becomes actively hostile when he is criticized.	-4	
47. He yields meekly to the demands of others.	4	
2. He usually withdraws in social situations.	5	
9. He blames himself when criticized.	5	
18. He accepts rather passively any impositions made upon him.	5	
30. He is unable to recognize affection when it is offered to him.	5	
49. Rejection from others only makes him more aggressive.	-5	
50. He is tactful and considerate with other people.	5	
4. He gives in immediately when attacked.	6	
29. He reacts in a hostile and aggressive fashion in his interpersonal contacts.	-6	(F ₁ -5)
59. He is responsive to the needs and wishes of others.	6	

Composition of third nonparametric factor

Fut. 7, Klo. 3, Ans. 3, Gre. 5, Kel. 4, Dia. 7 (last pattern, Table 8)

72. He adapts fairly easily to authority demands.	4	
16. He is rather cold and impersonal in his interactions with women.	-5	
14. He does not invest affect in his interpersonal relationships.	-6	
38. He is quite responsive when people show an interest in his welfare.	6	
64. He actively seeks social contacts.	6	
73. He becomes negativistic when people show a friendly interest in him.	-6	(F ₁ -6)

What is the nature of this factor? Obviously it is one in which Ansbacher (average rating of 3.0) is at one end of the continuum and Futterman (average rating of 4.3) is at the other (Table 5). Green and Kelly tend to agree with Ansbacher, Diamond agrees slightly, and Klopfer tends to concur in Futterman's judgment that the type of item is not particularly applicable to the case, one way or the other.

How shall we "name" it? If we return to Table 6 we find the best matching scores are found opposite Items 8, "He has very few friends;" 45, "His friendships seem rather stable and have relatively few conflicts"—reflected; and 53, "Friendly gestures from others arouse his suspicion and hostility"—reflected. Some of the other items that match the scanning pattern closely are 1, "He likes and seeks the companionship of others;" 15, "He is constantly fighting

his environment"—reflected; 25, "He becomes quite aggressive in most social situations"—reflected; 32, "He competes very strongly with father figures"—reflected; 41, "He gets along well with most people"—reflected; and 51, "He runs away from hostility in others."

It should be kept in mind that this first nonparametric factor is not to be taken as a statement of the main or outstanding feature of Mr. A. S.'s case. That is something revealed simply by extreme ratings. It is, rather, a cluster of issues in which there is consistent agreement and disagreement among the clinicians. It is, therefore more descriptive of the clinicians as a heterogeneous group, than of the group's consensus of opinion or the "real" dynamics of the case.

It is possible to compare the first factor obtained by this nonparametric method with the first factor in Gulliksen's conventional analysis. Figure 1 shows a plot of the loading of Gulliksen's first factor against the mean rating totals taken from the next to the last panel of our Table 5. The alignment is remarkably regular, probably more so than one could ordinarily expect, since the two factors, the one parametric and the other nonparametric, are only remotely comparable.

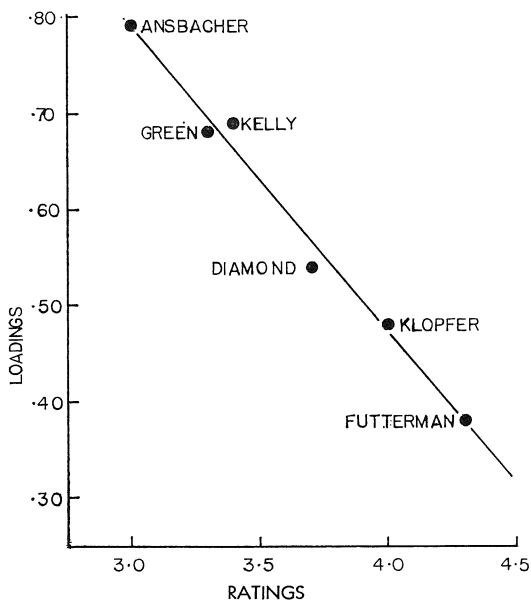


FIG. 1. Mean ratings of items in first nonparametric factor versus loadings of first parametric factor.

Second Factor

Now we can examine the items not generalized by the first factor and see if there is another scanning pattern which will economically represent a considerable group of them. Suppose we say that any item which does not match our first factor scanning pattern with a score of less than 10 has not yet been adequately represented. This is to say that the scanning pattern is acceptable for an item if it averages no more than one and a half points of matching the item ratings. This is an arbitrary decision, but then, so are all decisions regarding acceptable fiducial limits. This criterion is stated in the right hand column of Table 7, with the notation $\Sigma(X-X_1) > 9$.

According to our criterion there are 17 items that fall outside the constellation of the first factor. In developing our scanning patterns for the second factor we shall confine our attention to these items. Our first trial scanning pattern for these 17 items is developed as it was for the first factor—by averaging each clinician's ratings, taking account of reflections, and then by expanding the scanning pattern. In this case, however, the expansion is from one (Futterman and Klopfer) to six (Kelly), since Kelly's average rating for these items is greater than five. The average and expanded values are shown in the first panel of Table 7. The matching scores are shown, as before, in the first column under "Second factor trials" in Table 4.

We now proceed to the second trial scanning pattern for the second factor, f_{2t2} . There are two criteria now to be met in selecting the items, a minimum matching score with the scanning pattern of the first factor—to keep the two factors at arms length from each other—and a maximum matching score with the scanning pattern of f_{2t1} . If we hold to the same criterion in the first instance, a matching score of greater than nine with the first factor scanning pattern, and then impose the additional requirement of a low matching score on the trial scanning pattern we have just used, there will be scarcely any of our 17 items left. In order, therefore, to keep our pool of items from shrinking unreasonably we shall apply a more liberal second criterion and accept any item that matched the first trial scanning pattern, f_{2t1} , with a score of ten or less. There are 11 items which now meet both criteria. Each is marked with an asterisk in Column 1 under "Second factor trials" in Table 4. The averages are shown in Table 7.

In developing our third trial scanning pattern for the second factor we can, at last, afford to tighten up our second criterion very slightly, just as we did in developing the first factor. For f_{2t3} items we shall

TABLE 7. SUCCESSIVE APPROXIMATIONS OF SECOND FACTOR

Successive trials		Fut.	Klo.	Theoreticians' ratings			Dia.	Criteria
				Ans.	Gre.	Kel.		
f_{2t1} ($N = 17$)	Totals	59	57	81	72	88	82	$(a) \Sigma (X-X_1) > 9$
	Means	3.5	3.3	4.8	4.2	5.2	4.8	
	Pattern	1	1	5	3	6	5	
f_{2t2} ($N = 11$)	Totals	28	35	58	41	64	55	$(a) \Sigma (X-X_1) > 9$ $(b) f_{2t1} < 11$
	Means	2.5	3.2	5.3	3.7	5.8	5.0	
	Pattern	3	3	5	4	6	5	
f_{2t3} ($N = 13$)	Totals	38	43	67	50	72	65	$(a) \Sigma (X-X_1) > 9$ $(b) f_{2t2} < 10$
	Means	2.9	3.3	5.2	3.9	5.5	5.0	
	Pattern	3	3	5	4	6	5	
F_2	Gulliksen's F2 loadings	-.37	-.33	-.06	-.19	.48	.27	

require that the f_{2t2} scanning pattern have matched the item ratings with an average score of nine or less. Thirteen items meet the tightened criteria; their average ratings, still taking reflections into account, are shown in the next panel of Table 7 and are marked with asterisks. The rounded values of these averages show no change from those of the preceding trial scanning pattern, so we may consider that we had already reached a satisfactory statement of the second factor in the second trial. No third trial column is shown in Table 4.

Figure 2 is a plot of our second factor average ratings against Gulliksen's second factor loadings. Again, there appears to be a closer relationship than one might normally expect.

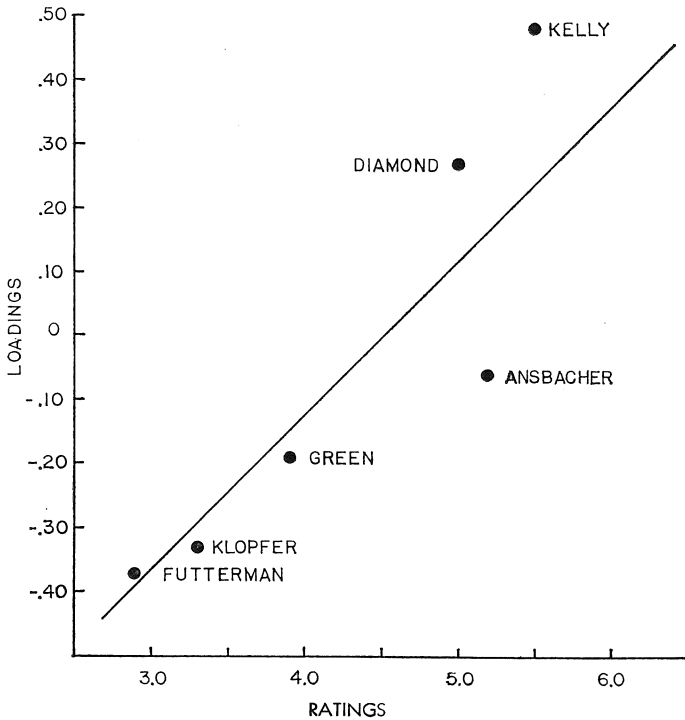


FIG. 2. Mean ratings of items in second nonparametric factor versus loadings of second parametric factor.

There are 13 items which match our second factor scanning pattern with a score of six or less, and 40 which match it with a score of nine or less. (See Table 6.) Some of the items, of course, match both

factors rather closely, e.g., Item 31, "He retreats when people become aggressive toward him." The two scanning patterns match each other with a score of nine, indicating that they are by no means orthogonal to each other.

Third Factor

There is some question about the value of proceeding to the development of a third factor. If we apply the same criterion as we did before in selecting our remaining "unexplained" items (matching scores of greater than nine with both preceding factors) we shall have only four surviving holdouts—Nos. 16, 17, 46, and 72. This hardly seems enough to make a fuss over. Nevertheless, we shall persist in our enterprise to see what comes out.

The procedure is the same as before, except that we have two criteria to meet in selecting our initial pool of items—matching scores of more than nine on *both* factors one and two. In developing the scanning pattern f_{3t2} we shall impose a third criterion—a matching score of less than 12 with the preceding pattern f_{3t1} . We can tighten up this requirement in developing f_{3t3} and require that items match

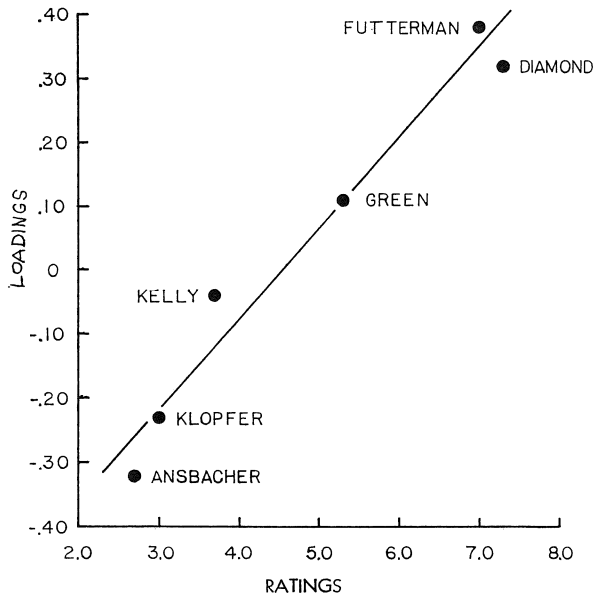


FIG. 3. Mean ratings of items in third nonparametric factor versus loadings of third parametric factor.

TABLE 8. SUCCESSIVE APPROXIMATIONS OF THIRD FACTOR

Successive trials		Fut.	Klo.	Theoreticians' ratings		Kel.	Dia.	Criteria
				Ans.	Gre.			
f_{3t1} (N = 4)	Totals	23	14	20	20	18	17	(a) $\Sigma (X-X_1) > 9$
	Means	5.7	3.5	5.0	5.0	4.5	4.2	(b) $\Sigma (X-X_2) > 9$
	Pattern	7	2	5	5	4	4	
f_{3t2} (N = 4)	Totals	27	10	14	18	16	25	(a) $\Sigma (X-X_1) > 9$
	Means	6.7	2.5	3.5	4.5	4.0	6.2	(b) $\Sigma (X-X_2) > 9$
	Pattern	7	3	4	5	4	6	(c) $f_{3t1} < 12$
f_{3t3} (N = 3) F_3	Totals	21	9	8	16	11	22	(a) $\Sigma (X-X_1) > 9$
	Means	7.0	3.0	2.7	5.3	3.7	7.3	(b) $\Sigma (X-X_2) > 9$
	Pattern	7	3	3	5	4	7	(c) $f_{3t2} < 10$
	Gulliksen's F_3 loadings	.38	-.23	-.32	.11	-.04	.32	

f_{3t2} with a score of nine or less. This calls for the sacrifice of one of our precious four items, No. 17, but we are carrying out our ground rules literally. When we start to construct f_{3t4} we find that we shall be dealing with the same three items. There is no point in continuing further, so we shall let f_{3t3} stand as our final F_3 scanning pattern. The successive trial scanning patterns for this factor are all shown in Table 8.

Figure 3 is a plot of our third nonparametric factor against Gulliksen's third parametric factor. The correlation is genuinely surprising in this case, since our factor was based on only four leftover items, hardly a very stable basis for approximating the mathematically more elegant conventional factor analysis.

Relations between the Factors

The method of counting the matches between patterns gives us a measure of the relationship between them, but since they are not construed as scales, i.e., are nonparametrically construed, it is not immediately apparent what degree of mis-matching would correspond to orthogonality, or complete independence between factors. To compute such a measure would require our making some assumptions about the probability of two patterns matching each other by chance. As far as this study goes, this does not seem particularly worthwhile. It is of interest, however, to report how closely the three factor patterns match each other. The pattern of the first factor, F_1 , matches that of F_2 with a score of nine, and F_3 with a score of 10. The pattern F_2 matches that of F_3 with a score of 11. The factors are thus spaced about as far apart as one would expect, considering the criteria we applied.

INFERENCES

At the beginning of this paper we posed a number of questions. Some proved to be unanswerable and therefore remain with us as warnings against the temptation to nail down our conclusions too tightly. Others could be answered on logical grounds. Still others were deferred until after we had developed a method of analysis. Now that the mathematics has been completed, we are ready to return to the dangling issues.

Items and Theoreticians

In a problem of this sort the conventional method of factor analysis would base its factors either on items or theoreticians. Yet it

would not do both at the same time. That is to say, it would not refer to theoreticians and items in the same factorial terms. The method we propose does do both at the same time. It discloses plausible patterns of agreements and disagreements between theoreticians, and it points out the specific items in which each pattern is consistently manifest. Thus the method pinpoints theoretical alignments in terms of who says what.

Since the factors emerging from this computation are expressed nonparametrically, they invite attention to those items which certain theoreticians believe to be both true and important in the clinical case under observation. If the factors were regarded parametrically they might have greater abstractive transitivity, but they would not point up the issues in this manner.

The Grasp of Meaning

Factor analysis can be regarded as a way of displaying information in an economical way. As we have suggested before, this is the answer to a minimax problem—how to reduce a maximum of information to a minimum of terms. It is the baffling complexity of psychological processes that makes psychologists seek to encompass a maximum of information, and it is the limited ability of the human mind to orient itself in hyperspace that makes them try to keep the number of factors at a minimum.

But there is another problem, too. Man has difficulty construing along unfamiliar lines, even when they are drawn with mathematical simplicity. His notions are held fast in a network of personal constructs and any ideas or feelings that have not yet found their place in that network are likely to remain exasperatingly elusive. Science, therefore, not only has the task of coming to simple terms with events, but it also has the psychological task of achieving some accommodation between what man believes and what, indeed, confronts him.

Following this line of reasoning, it is possible, and often desirable, to compute nonparametric factors in such a way that they tend to be aligned with those items which seem to make the most sense (5). But thus far we have not done so in this case. We shall, therefore, first try to make sense out of our factors by verbal inference only.

Name Calling

Table 6 displays items arranged according to their alignment with the nonparametric factors we have computed. Items are arranged in

each factorial group in order of the closeness with which they match the factor's scanning pattern. From these arrays of items one can formulate some kind of modal statements to represent the factors.

In some instances an item matches the scanning pattern of more than one factor. This is shown in the right-hand column. Item 73, for example, matches the scanning patterns of F_1 and F_3 equally well. We shall have to exercise some caution, therefore, in making inferences from such items.

Each factor's scanning pattern is shown also. The rounded scanning pattern of the first factor, F_1 , is seen to be one in which Ansbacher, Green and Kelly are pitted against Futterman, Klopfer, and Diamond. Moreover, it is a pattern in which one group judges an item to be somewhat true and significant, while the other sees it to be possibly true, but not significantly so. With this pattern spread before us and with our knowledge of what the theoreticians have said about their theories we can make some educated guesses about what the factor refers to.

Where a matching score is shown to be negative in either of the last two columns of Table 6, it indicates that the meaning of the item must be reflected in order to be aligned with the factorial scanning pattern. In the first factor, F_1 , for example, Item 15, "He is constantly fighting his environment," must be considered in a reverse sense, while Item 8, "He has very few friends," can be taken as it stands.

First factor: Emphasis on interpersonal relationships. As we examine the items listed under the first factor in Table 6 we find the closest matching scores in Nos. 8, 45, and 53—all concerned with friendships. But as we go further down the list to the less closely related items, we unveil a picture of a person who seeks friendships but who fails because he cannot muster the aggression, in the sense of initiative, necessary to hold his own.

It is this kind of item that Ansbacher, the Adlerian, thinks is both true and important in Mr. A. S. while Futterman, the Freudian, is inclined to pass it up. Green, the Sullivanian, and Kelly, the personal construct theorist, also make more of this "social" type of item, while Klopfer, the Jungian, and Diamond, the nondirectivist, regard it more as Futterman does (Figure 1 and Table 5). This alignment of theoreticians suggests that the issue at stake may be the comparative emphasis on interpersonal relationships, on the one hand, and intrapersonal dynamics on the other.

Second factor: Distinguishing between Aggression and Hostility. The second factor is one which pits Futterman and Klopfer, average ratings of 2.9 and 3.3, respectively, against Kelly, whose average rating of 5.5 puts him slightly on the opposite side of the fence. Diamond is strictly neutral, if we may interpret a rating of 5.0 to mean neutrality. Ansbacher leans ever so slightly toward Kelly's somewhat negative position (Figure 2 and Table 7).

As we run down the list of items in order of their matching scores, we see the kind of aggressiveness—or lack of it—that the Freudian and Jungian think is important in this case. To this writer, who makes a point of distinguishing between hostility and aggression and regards the latter as a dimension ranging from initiative to inertia, these items seem more to imply hostility, and Mr. A. S. appears to him to have some of it.

The editors, Farberow and Shneidman, point out—quite correctly—that the terms are commonly used synonymously and therefore—questionably perhaps—draw their generalized conclusions in the case without distinguishing between them (2, pp. 299-300). But the factor analysis suggests that here is a possible major issue between the theoretical approaches.

Third factor: Emphasis on authority relationships. The third factor is one in which the Freudian and the Rogerian team up against the Adlerian and the Jungian (Figure 3 and Table 8). This is enough to raise anyone's curiosity. The most distinctive item in this constellation appears to be No. 72, "He adapts fairly easily to authority demands." Diamond and Futterman make a point of saying that he does not; Ansbacher and Klopfer insist that he does. Is this alertness to difficulties with authority the predisposition that makes bed-fellows of the Freudians and the nondirectivists, and distinguishes them from the Adlerians and Jungians?

After examining the factorial structure, Ansbacher gives the following interpretation which seems to sum it up quite well.

Factor three would be the bias to assume hostility toward all authority figures. According to the various items pertinent here, assumption of a negative attitude to mother, women, authority figures, men—a general hostility, is involved. This would be in accordance with Freudian theory of suicide as an act of aggression primarily. That this bias should also be present in the Rogerian, could be made plausible by remembering that Rogers, maybe more than others, believes permissiveness to be curative. The Jungian and the Adlerian, possibly the most optimistic, do not show this bias of assuming a generalized negativism and hostility (personal communication).

Our three-factor analysis leaves one orphan item, No. 17, "He goes out of his way to please people." Klopfer selects this as one of his three most descriptive statements.

TESTING HYPOTHESES

What has been accomplished so far is a mathematical display of information that may provide grounds for making inferences about the theoretical issues at stake among the six clinicians who judged the Mr. A. S. protocol. But we need not stop here. On the basis of our inferences we can set up hypotheses and, using the same computational scheme, test them out. Mathematics and clinical judgment may be used in an interlocking fashion, notwithstanding the prejudices of mathematicians and clinicians against each other.

The Aggression-Hostility Hypothesis

In discussing the second factor the writer said he suspected the theoreticians differed from each other in the way they clinically construed aggression and hostility. Suppose we test this hunch.

When the writer uses the term, "aggression," he thinks of an axis of reference running from initiative to inertia on which a person may be described as well up toward the initiative end. He regards "hostility," on the other hand, as a dimension of appraisal at one end of which are represented efforts to immobilize persons or to extort their conformity to one's outmoded predictions of them. The opposite pole would be—not inactivity—but a liberalism of curiosity directed toward providing the greatest freedom of movement for others at the expense of one's preconceptions of them. Whether or not others are hurt is irrelevant, but any effort to incapacitate them would be regarded as hostile. Similarly, the aggressive person, who keeps upsetting apple carts, may be regarded as hurtful by those who do not like to be disturbed or have their circumstances altered. But that does not mean that the actor is hostile. This distinction between aggression and hostility is anchored in personal construct theory—but that is a long story and there is no need to go into that here.

In originally making the Q-sorts, the writer had to do the best he could with items obviously written by someone who did not use the terms in the same way he did and who probably also did not consider it important to distinguish between behavior along such reference lines.

Now suppose we impose this hypothesis about the distinction be-

tween hostility and aggression upon the data, such as they are. First the writer selected eight items that seemed to him to suggest the aggression axis, ranging from initiative to inertia. These items were used as an initial pool from which to derive an "aggression factor." Using the same method of nonparametric factor analysis, a scanning pattern was developed against the rather tight criterion of a matching score of no more than four. Only three of the items survived, but five additional items were picked up from elsewhere in the deck. The structure of this "aggression factor" is shown in Table 9.

Next the writer chose twelve other items that might suggest the hostility axis, ranging from extortion to curiosity. Six of these items survived and two additional items were picked up, as also shown in Table 9. It is to be noted that here, as in the "aggression factor" items, both the terms "aggression" and "hostility" are to be found.

TABLE 9. COMPOSITION OF HYPOTHESIZED FACTORS

Item no.	Principal items in order of conformity to factorial scanning pattern	Matching score
<i>Aggression factor</i>		
Fut. 5, Klo. 4, Ans. 2, Gre. 3, Kel. 4, Dia. 5		
65.	Even the mere presence of other people produces immediate drawal in him.	1
73.	He becomes negativistic when people show a friendly interest in him.	-2
53.	Friendly gestures from others arouse his suspicion and hostility.	-3
8.	He has very few friends.	4
15.	He is constantly fighting his environment.	-4
25.	He becomes quite aggressive in most social situations.	-4
32.	He competes very strongly with father figures.	-4
43.	He is quite passive in most of his interpersonal contacts.	4
<i>Hostility factor</i>		
Fut. 2, Klo. 4, Ans. 4, Gre. 4, Kel. 6, Dia. 5		
47.	He yields meekly to the demands of others.	1
31.	He retreats when people become aggressive toward him.	2
49.	Rejection from others only makes him more aggressive.	-2
35.	He becomes actively hostile when he is criticized.	-3
2.	He usually withdraws in social situations.	4
9.	He blames himself when criticized.	4
40.	His immediate response when threatened is to fight back.	-4
57.	When others show an interest in him, he immediately becomes aggressive and demanding.	-4

There is another point of interest. All eight of the "aggression factor" items turn out to be critical items in Factor I and none is from Factor II. Of the eight "hostility factor" items seven turn out to have

been critical items in Factor II and none was a critical item in either of the other factors. Not only does our hunch about the issue of aggression and hostility appear to be confirmed, but it also appears that aggression—as I understand it—is a principal component in our big general Factor I.

Differences between Theoreticians

Now let us see what this means in terms of theoreticians. The two scanning patterns are shown in Table 9. If we compare the scanning patterns we can see that the antithesis of “hostility”—as I construe it—is something that Futterman reads into the case as important, but the antithesis of my kind of “aggression” is not. Ansbacher does not see my “hostility” as particularly important, but the opposite of my “aggression” he does. As for myself, I apparently saw Mr. A. S. as slightly hostile but also somewhat inert. The other theoreticians do not distinguish significantly between these two factors.

CONCLUSIONS

Our nonparametric method of factor analysis permits us to examine comparative clinical judgments in terms of items and clinicians, both at the same time. While the data at hand have certain limitations that limit the amount of analysis one might attempt in an ideal situation, it is possible to see within these clinical judgments certain systematic differences. This suggests that theoreticians do make clinical decisions related to their theoretical systems.

The Emerging Theoretical Issues

On the first time around, a broad general factor of difference between theoreticians seems to be the relative *emphasis placed upon interpersonal relationships*. The Adlerian placed greatest emphasis on this factor, with the Sullivanian, the personal construct theorist, the nondirectivist, the Jungian, and the Freudian, following in that order.

The second factor, a somewhat narrower one, I guess has something to do with *distinguishing between what I would call “aggression” and “hostility.”* It puts the Freudian and the personal construct theorist at opposite ends, with the Jungian and the Sullivanian leaning toward the Freudian, and the nondirectivist and the Adlerian indifferent.

The third factor, a very narrow one, finds some of the theoreticians taking diametrically opposed views. It has to do with *emphasis on*

affect and authority relationships. The Freudian and the nondirectivist regard it as important that Mr. A. S. cannot manage such matters. The Adlerian and the Jungian take the opposite view, while the others take an intermediate stand.

In testing the hypothesis that there is an issue at stake related to the distinction between hostility and aggression two clear-cut factors emerge. One of them, aggression, appears to account for a significant component of Factor I (interpersonal relations), but not the other. The Freudian sees the lack of hostility as important, but not the lack of aggression. The Adlerian does not see hostility or the lack of it as important, but the lack of aggression. The personal construct theorist sees Mr. A. S. as slightly hostile, but also exhibiting some lack of aggression. The others make no important distinction. I would take this as confirming my hypothesis about some theoretical confusion in the area of hostility and aggression.

Summary

Factor analysis, so often regarded as a means of forcing data to yield up neatly packaged meanings, leaves much to be desired. The use of Q-sort items also has many pitfalls. But for the purpose of clarifying the differences between theoretical positions, a nonparametric method of factor-analyzing Q-sorts, which embraces both items and theoreticians in the same factorial composition, may prove to be of assistance. In an illustrative case involving a suicidal attempt, where six theoreticians Q-sorted items after study of a blind protocol, certain interesting alignments between a Freudian, a Jungian, an Adlerian, a Sullivanian, a personal construct theorist, and a nondirectivist were suggested.

REFERENCES

1. CROMWELL, R. L., & CALDWELL, D. F. A comparison of ratings based on personal constructs of self and others. *J. clin. Psychol.*, 1962, 18, 43-46.
2. FARBEROW, N. L., & SHNEIDMAN, E. S. (Eds.) *The cry for help*. New York: McGraw-Hill, 1961.
3. KELLEY, T. L. *Crossroads in the mind of man*. Stanford, Calif.: Stanford Univer. Press, 1928.
4. KELLEY, T. L. *Essential traits of mental life*. Cambridge, Mass.: Harvard Univer. Press, 1935.
5. KELLY, G. A. *The psychology of personal constructs*. Vol. 1. New York: Norton, 1955.
6. THURSTONE, L. L. *The vectors of mind*. Chicago: Univer. Chicago Press, 1935.