Brit. J. Psychiat. (1969), 115, 1287–96

Theory and Technique of the Repertory Grid

Being a review of *The Evaluation of Personal Constructs* by D. Bannister and J. M. M. Mair*

By PATRICK SLATER

1. *Personal construct theory*

George A. Kelly graduated in engineering with psychology as a subsidiary subject at the time when the boom of the 'twenties in the United States was collapsing into the depression of the early 'thirties. He found it impossible to obtain employment as an engineer and went to practise psychology in an impoverished, inaccessible area on the border of the dust-bowl. There he had to do the best he could to diagnose and treat the peculiar psychological problems of his patients by himself without the advice or assistance of any medically qualified psychiatrist or other psychologist within reach for consultation. He found little help in the popular psychologies of the period, behaviourism and psychoanalysis. Through trying many experimental approaches he gradually developed a homespun psychology which he expounded in a two-volume book, *The Psychology of Personal Constructs* (1955) and elaborated in a very large number of other publications after he entered the academic world.

An essential tenet of this is that to understand an individual's psychological problems it is necessary to find out how he personally interprets or *construes* the world around him. A good way of eliciting one of the constructs he uses in thinking about people, for instance, is to ask him to consider three people he knows and describe some way in which two of them are alike and different from the third. The characteristic which the two share defines one pole of a bipolar evaluative scale and the contrasting characteristic which distinguishes the third defines the opposite pole. It is possible to go on then and evaluate other people on the same scale. If for instance he considers two of the three people compared sincere and the third by contrast hypocritical, the scale or construct "sincere . . . hypocritical" is one he may be able to extend to other people he knows. Each such construct has a limited range of convenience. The same technique may be used to compare other triplets and elicit further constructs, and thus explore the system he applies to the people he meets. It may be extended to include the terms he uses for comparing himself with other people.

More precisely, a construct subsystem is a set of constructs which have a common range of convenience. Apart from his subsystem for comparing people the same individual may perhaps have another subsystem for considering possible careers, another for his choice of breakfast cereals, and so on. There may be very little overlapping between some of the subsystems and some of his constructs may even appear incompatible with others. But as constructs may themselves be construed, e.g. as "compatible . . . incompatible", some may be regarded as subordinate to others, and all the constructs an individual uses are presumably combined in some hierarchical way to constitute his personal construct system in its entirety. The technique for eliciting them can be applied throughout.

People use their construct systems to anticipate events and plan future courses of action; and they can modify them in the light of their experiences. Kelly supposes that every individual has a particularly important set of constructs, his core constructs, which relate to himself and sustain his feeling of self-identity under the bludgeonings of chance. Disruptions of such systems are liable to be accompanied by mental

* London: Academic Press, 1968. Pp. 232. Price 50*s*.

disturbances. Feelings of anxiety may be experienced by an individual when events outside the range of convenience of his construct system appear to require changes in his core structure; or feelings of guilt when he finds himself embarked on a course of action inconsistent with it. Therapy may involve inducing him to accommodate himself to necessary modifications in it while reducing the threat of disruption as far as possible. The interviewing technique which serves to define his problem for him in terms he can recognize and accept may help the process.

Evidently Kelly's psychology was clinically orientated in its origins, but it extends indefinitely. He found that it could be applied to the problems his students brought him for discussion in connection with their researches as well as to the personal problems brought by his patients. Any term of discourse whatever—thing or theory—considered by an individual can be treated as the point of intersection of certain constructs in his system as a whole. And all his behaviour is determined by the way his system leads him to anticipate the outcome. Thus in its full extent the theory of personal constructs can be claimed to cover all psychological phenomena whatever, cognitive, conative and affective. It also refers back to itself—not like behaviourism, for instance, which has difficulty in accounting for the behaviour of the behaviourist.

2. Grid technique

The personal constructs of an individual which form a subsystem with a common range of convenience can be investigated by a very flexible interviewing procedure using some such technique as the one already described for eliciting them. The interview has a skeletal structure and provides results which can be recorded in a grid. The first step is to identify the *elements* or items extending over the range of convenience—the people, the occupations or the breakfast cereals for example, that are to be compared. Then the constructs are obtained to provide the scales for evaluating them. A numerical entry is recorded on a table with a row for every construct and a column for every element, recording the value assigned to each element in terms of each construct. The completed table is the grid.

In the classical example of a grid, the Role Construct Repertory Test described by Kelly, the elements are people—your wife or girl friend, husband or boy friend, your father, your mother, a teacher you like, a teacher you dislike, etc. (Note, not just people chosen at random and identified by passport photographs, say, but people presumably playing important roles in the informant's life history.) The intention is evidently to cover the subsystem for people as widely as possible, and people chosen for special reasons may be included in a particular case. Evaluation is in terms of a simple dichotomy, assigning the elements to two constrasted groups not necessarily of equal size.

This procedure introduces a number of restrictions which need not apply to grids in general. For instance, grids accepted for analysis in the service provided by the Medical Research Council may refer to any set of elements selected to cover the range of convenience which is of interest in the case. Any procedure can be used to obtain the constructs. Evaluations may be expressed on any numerical scale. Some such procedures and scales may be less sensitive than others to the psychological phenomena the grid is intended to record, but differences in such respects do not generate any grids that cannot be analysed. A grid is acceptable provided it is a complete data matrix of known commensurate real numbers recording the variation in a personal construct system due to the interactions of a set of elements with a set of constructs.

A grid may be said to have certain essential properties: notably that the variation it records is due to construct/element interactions; that it defines by column a dispersion of constructs in an element space, and by row a dispersion of elements in a construct space; that the whole of the variation is restricted to a limited number of independent components, which can be ordered in magnitude from largest to least; and that each component refers both to an axis in the element space and to a corresponding axis in the construct space. In terms of these properties a systematic, exhaustive analysis can be made of the grid.

It also has an indefinitely large number of derived properties—that is to say ones which follow necessarily from its essential properties. Their relations to one another can be inferred from their relations to the essential properties. Such for instance are the correlations and angular distances between the constructs, and the distances between the elements; and many others might be added.

If full use is made of all the options, INGRID, the regular programme for analysing individual grids under the M.R.C. Service, provides a complete analysis of a repertory grid in terms of its essential properties, and lists some of the derived properties likely to be found of general interest. It specifies the relationships of the constructs to one another, of the elements to one another and the relationships between the elements and the constructs.*

There are, furthermore, an indefinitely large number of arbitrarily defined and undefined properties which may be attributed to grids. For example a research worker might suppose that Arts students in his university show more "Fertility" than "Sensitivity" in their grids than Science students; devise formulae for calculating scores of F for fertility and S for sensitivity; and carry out an experiment to test his hypothesis. Whatever its outcome, the research would attribute two new undefined properties and two arbitrarily defined properties to grids.

Finally there are presupposed properties, which may be fitted onto a grid approximately to satisfy theoretical requirements, regardless of whether it actually possesses them or indeed can possibly possess them, c.f. Slater, 1964. Specific factors, all-positive manifolds and simple structure are among them. From them further properties may be derived, such as are often hailed as "factors", though they bear no marks to distinguish them from arbitrarily defined properties in general.

Arbitrarily defined properties are all potentially interesting, whatever their origin, but they cannot serve to provide a systematic, exhaustive study of a grid. The M.R.C. service does not cover them.

3. Some comments on "The Evaluation of Personal Constructs"

In his own works Kelly develops his arguments by easy stages, writing in a discursive, intimate, anecdotal style. To some people they are very persuasive; but others find them rather soporific and I have come across more than one who has faltered before perusing both volumes of *The Psychology of Personal Constructs* from cover to cover. They will certainly welcome this book by Bannister and Mair. The first two chapters give an excellent exposition of the whole theory, with no critical asides. Other useful features of the book are a detailed account of Hinkle's extensions of Kelly's methods, otherwise only available in an unpublished thesis; and a very comprehensive review of Bannister's own researches. In other respects the book is regrettably partial—that is to say, both incomplete and biased.

The authors are devoted adherents of the theory, fascinated particularly by its comprehensiveness. In their criticisms of other people's work in the same area but not inspired by the same theory they make the theoretical errors and inadequacies their targets. One for instance is dismissed with the comment that "in the empiricist tradition" he "has built a micro-theory in conjunction with a favoured method . . . rather than having elaborated methods out of a comprehensive theoretical framework".

After their extensive exposition of the theory, their lengthy discussions of its relations to other theories and their detailed descriptions of procedures for administering grids and recording the data obtained from them, the authors have surprisingly little to say on how the data should be analysed and the results interpreted, and most of that little is ill-considered and unhelpful. They make no attempt to evaluate the efficiency of different methods of analysis:

* Apologies are offered for any obscurities in this very brief summary of the output from INGRID. Further information is given in a monograph *The Principal Components of a Repertory Grid*, obtainable from the Institute of Psychiatry, de Crespigny Park, London S.E.5, and in *Notes on INGRID 67* and *Advice on Submitting Grids for Analysis by INGRID 67*. Information on the programme mentioned later, DELTA, is provided in *A Summary of the Output from DELTA*. The charge for the monograph is 15s.; the other material is available without charge.

crude and refined, consistent and inconsistent, complete and inadequate are briefly mentioned side by side. They give no information whatever about the service provided by the M.R.C.; they do not even mention its existence. They exhibit a positive aversion to completeness and efficiency: "It would seem unwise", they say, "to blur the primary data by complex and extensive mathematical analyses." On the contrary, it would seem difficult to plan any investigation competently without understanding what sorts of results a thorough analysis of the data can provide.

In all their discussions of the results of the experiments they describe, whether their own or anyone else's, the authors only mention relationships between constructs. They disregard the fact that a grid exhibits an interaction-system and that the relations between the constructs are defined by their locations in an element-space. They do not examine the relations between the elements or of the elements with the constructs. Consequently they waste most of the information in their data, large parts of it entirely.

Perhaps the explanation is to be found in one of the tenets of the theory, that elements are constructs by another name. "Everything in a person's outlook", they report "is for Kelly a construction, and the ideas of a *dog*, a *table* or a *best friend* are alike in being interpretations or constructions of events." Acceptance of this tenet may have imposed a limit on their field of vision, making them assume that when they have finished examining the relations between the constructs they have exhausted all the information in a grid.

The tenet seems to me questionable. I doubt whether any cogent epistemological argument can be found for it; and we are by no means bound to accept it simply on the authority of Kelly. It may perhaps be found to be expendable without jeopardy to the rest of his theory. Construing is an operation which cannot be performed with nothing to apply it to. Constructs may be construed, it is true, but somewhere at the end of the chain presumably there are stimuli which have to be accommodated within the construct system. Grid technique requires a set of elements as well as a set of constructs—or, if you prefer, of constructs *qua* operands as well as constructs *qua* operators. Suppose, to the contrary, we replace all the elements in a grid by constructs: in a grid with people as its elements, for instance, we might replace the element "me" by the construct "like me", and continue similarly until all the elements have been turned into constructs. The data matrix will then become an empty one with rows but no columns.

What is methodologically important is that the data refer to two sets of entities interacting one one another. Giving one set any precedence over the other is not edifying. If construing is an operation which can only be performed when a set of elements is given, it might just as well be said that the elements are the operators and the constructs the operands as vice versa, for the elements put the constructs into operation. The data only show reciprocal interactions such as are found in mathematics where, if y is a function of x, x is at least implicitly a function of y.

The authors evidently consider that elements are eliminated in the arrays of data devised by Hinkle and called "resistance to change" and "implication" grids. But what actually occurs is that the same constructs are used both as operators and operands. As a result special restrictions are introduced which do not affect grids of the kind already described. Both Hinkle's arrays are square matrices with no entries in the leading diagonal. Certain specified non-numerical entries are admissible elsewhere. The first, a variety of preference matrix, is anti-symmetrical. The second appears to be the sum of two matrices, one symmetrical and one asymmetrical. The essential properties of these Hinkle grids are quite unlike those of Kelly grids, and analysing them presents different methodological problems. The blanket definition of a grid the authors have devised to include all three is unworkable.

Perhaps if they could adjust their theory to the view that the terms defining the rows and columns of a grid refer to two sets of constructs, operators and operands, the column-constructs being called elements to distinguish them from

the row-constructs, the authors might be able to reconcile their principles with examining the parts of their data they are ignoring at present.

4. The hypothetico-deductive method and empirical eclecticism

Preoccupation with theoretical considerations is not a characteristic peculiar to Bannister and Mair, nor are they the only psychologists to ignore evidence outside the range of convenience of their pet theories. Many are like archaeologists in the early nineteenth century, who turned over their excavations hurriedly and carelessly in search of gold and jewellery and paid no attention to clay tablets, pottery or kitchen middens. Fortunately for psychologists their losses through oversights are not so expensive and irretrievable.

The partial blindness seems to be traceable ultimately to a popular misconception of how the hypothetico-deductive method should be applied: namely, that a hypothesis should be formulated before any experiment is carried out, and the experiment should be designed so that it will give the result expected if the hypothesis is true, but not if it is false. A typical remark which illustrates the consequences of this way of thinking was made to me shortly after I joined the Institute by a colleague who has since attained academic eminence in another part of the world. He came to ask me to arrange for the analysis of a large collection of data, explained his hypothesis carefully, and added: "I don't want to know anything else about what the data show—all I want to know is whether they confirm my hypothesis or not."

In the hope that it may relieve this common scotoma I am offering a restatement of the classical method of empirical eclecticism, and shall begin by reformulating the hypothetico-deductive method, which was over-simplified above.

A proposition P may be shown to be true or false syntactically or materially, i.e. its truth or falsehood either follows logically from acceptable premises or it can be verified by observation. It has a contrary C which is true if P is untrue and untrue if P is true. The relation between them is shown in the truth table below, where the truth value 1 stands for true, and 0 for untrue.

Set	P	C
i	1	0
ii	0	1

—meaning that the universe of discourse contains two sets (one of which may be empty): i, the set containing the instances where P is true and C is untrue, and ii, the set where P is untrue and C is true.

It may be possible to prove that another proposition, Q, follows from P by material implication. Take for instance "Today is Sunday" for P and "The banks in England are shut" for Q. The universe of discourse, all the days in the calendar, might conceivably fall into four sets.

Set	P	Q
i	1	1
ii	1	0
iii	0	1
iv	0	0

The only set of instances inconsistent with the proposition "P implies Q" is ii, containing the instances when today is Sunday and the banks are not shut. If this can be shown to be an empty set then Q is true whenever P is true and so "P implies Q" is true.

A hypothesis H is a proposition which can only be verified indirectly by material implication from an experimental test. Suppose it can be deduced (i.e. proved syntactically) from the hypothesis that I, the proposition that certain phenomena are observable, is true when H is true. H may be substituted for P and I for Q in this truth table. But clearly, experimental evidence that I is true may come from set i or set iii, so the truth value of H is left undecided. Only if I is untrue is the evidence decisive: it must come from set iv since the hypothetico-deductive argument has ruled out ii, so it follows that H is also untrue.

To prove that H is true it is evidently necessary to consider the implications of its contrary, the null hypothesis N. If it can be shown syntactically that N implies E, where E is a proposition which can be verified directly, set ii can be ruled out of the truth table:

Set	N	E	H
i	1	1	0
ii	1	0	0
iii	0	1	1
iv	0	0	1

Then if experimental investigations reveal instances where E is untrue, iv is the only alternative open. N is excluded and H must be true.

Bearing this in mind, the eclectic empiricist responds to every hypothesis he encounters with philosophic doubt. Like Newton, the father of the hypothetico-deductive method, he makes his maxim *Hypotheses non fingo*—freely translated, I don't go around making up hypotheses.* He prefers investigating directly verifiable propositions. When he finds making a hypothesis has become unavoidable, he starts immediately to consider the possibility that it is untrue. He looks for any evidence he can find to disprove it; and to aid him in his task he borrows any promising techniques he can find. When confronted with the data from an experiment he puts aside any previously proposed hypothesis, and looks at them impartially to see what they actually show. He pays careful attention to their limitations. He considers whatever other explanations can be found besides the one hypothesized. If the hypothesis finally proves entitled to some credence he allows it no more than he is sure it deserves, and still feels free to consider alternatives.

5. Grids and semantic differentials

Bannister and Mair are troubled by the close resemblance between repertory grid technique which is derived from personal construct theory, and the semantic differential technique which is related by Osgood and his colleagues to behaviourism (1957). They raise a large number of objections to semantic differentials on theoretical and administrative grounds and conclude that "the kind of assumptions they make and the kind of data they produce very nearly defy comparison" (with grids).

If the two techniques are regarded as experimental methods differences in their theoretical origins can be overlooked when they are applied. Although a particular theory may indicate that useful data may be obtainable by a certain technique, the finding that the data actually are useful does not necessarily imply that the particular theory is true. Moreover any macro-theory which purports to provide a complete psychology must be regarded as a notation system for formulating propositions about psychological phenomena in general. As all such systems have the same topic of discourse, it should be possible to translate any proposition from one of them into any of the others—only of course the formulation may be cumbersome and vague in one and convenient and precise in another; and if a system is incomplete there will be some propositions that cannot be formulated in it at all. Psychologists should be allowed freedom to discourse about both techniques, grid and semantic, in any notation they find convenient.

The question, "Are there any essential differences between the contents of a repertory grid and a semantic differential?" must certainly be answered "No". A semantic differential is a grid described in different terms: it is a matrix of known real numbers recording the variation in an individual's multidimensional meaning-space due to the interactions of a set of concepts with a set of scales. So we come back by the same door as out we went.

The differences between the techniques are not in their form but in the uses for which they are intended. Grid technique is specially adapted for studying individual cases, the semantic differential for studying representative samples of populations. In other words, the grid technique is primarily idiographic and the semantic differential nomothetic in application. Another important difference is in the aspect of the data on which interest is focused when they are analysed. Grid technique, as represented by Bannister and Mair at least, concentrates exclusively on the correlations between the constructs, i.e. on the dispersion of the constructs in the element space; while the semantic differential concentrates on the distances between the concepts (= elements) in the meaning space (= construct space).

* The choice of the derogatory repetitive *fingo* instead of the commoner *facio* cannot be overlooked.

6. Idiographic uses of grids

It is true that intermediate techniques can be developed between the purely idiographic and the purely nomothetic, as the authors point out in commenting elsewhere (p. 153) on some remarks of Vernon's. They are best regarded as hybrids with some properties of each kind. In a purely idiographic grid the elements and constructs should ideally be the ones which are most important for the study of the individual case. If the clinician supplies any they should be chosen for their relevance to the personal construct system under investigation. The object of the exercise is to discover as much as possible about the system, and no equivalence need be postulated between it and any other. Modifying grids for nomothetic use, i.e. for comparing individuals, favours choosing either the elements or the constructs, or both, for their general acceptability instead of their personal relevance. Thus attempts to increase their nomothetic usefulness tend to diminish their idiographic sensitivity and vice versa.

When the data come to be analysed, the distinction becomes categorical. The total variation observed in a set of grids collected from different subjects is divisible into two parts: the nomothetic part between subjects, and the idiographic within. The two are not commensurate, and any confusion between them is liable to lead to false conclusions. For instance to compare different classes of subjects the total between subjects must be partitioned into the amount between classes and the amount between individuals in the same class; then the former is tested against the latter. The variation within individuals is not taken into consideration. Comparing it with the variation between them would only support, at most, the trivial conclusion that differences between subjects are not negligible.

Statistical tests designed for nomothetic purposes tend to give meaningless results when applied uncritically to the idiographic data in a grid. For one reason, they presuppose that ways can be found for estimating the distributions of entire populations of elements and constructs in a private universe, and of sampling them at random. For another more technical reason, the data matrix from a grid often contains singularities which affect chance expectations: for instance when there are more constructs than elements the dispersion of the constructs in the element-space is restricted. and they cannot all be orthogonal to one another, i.e. uncorrelated. The unqualified remarks which the authors make themselves and also quote from Kelly, to the effect that the significance of measures of association between pairs of constructs in a grid can be determined by standard tests, are quite unfounded and should not have been made. They only betray that the problem has not been considered as carefully as it needs to be.

Here again the best procedure is to examine the data closely and avoid theoretical generalizations. How much are statistical tests needed in the study of the case? Is it necessary to attempt to draw conclusions about what is to be expected in some other case from what is observed in this one, or about what is to be expected in other regions of the entire personal construct system from what is observed in this part? If not, statistical tests are not required and the epithets "significant" and "significantly" can be dropped without any sacrifice of meaningful content from discourse about the system actually under observation. What is necessary is to ensure, by all precautions practicable, that it is the one that properly occupies the focus of interest in the case.

It is in studies of individual cases that the unique advantages of grid technique can be exploited most fully. There is very little on this subject in the book. Discussions and illustrations have been given by P. Slater (1965), I. M. Marks (1966), Marks and Gelder (1967), A. Ryle (1967), and A. E. May (1968); and a great deal of unpublished material has been collected by E. Bromley, I. G. Dresser, F. Fransella, R. D. Griffiths, R. Jamieson, A. Ogbourne, A. S. Presly, P. D. Slade, J. P. Watson, and others. The technique has been used to record changes in personal construct systems occurring during individual and group psychotherapy, behaviour therapy, aversion therapy, desensitization and other treatments (if only one based on personal construct

theory, as far as I am aware in Britain).

In some cases interest concentrates on changes in the use of certain constructs, but more often the changes which demonstrate the effects of the treatment most clearly are in the evaluation of certain elements. For monitoring changes during the course of a treatment it is advisable to use a grid with the same elements and constructs at every trial. If the object of the treatment is to modify the patient's attitude towards certain elements, e.g. towards himself, towards certain fetishistic objects or towards certain situations which are particularly liable to provoke feelings of anxiety or guilt—other comparable elements may be included towards which his attitudes are not likely to be affected. They can be used as controls, establishing comparatively stable check-points in the dispersion of the elements in the construct space; and the modifications produced by the treatment in the evaluation of the experimental elements can be expressed in terms of the distances and directions of the relative changes in their positions. Similarly a control set of constructs could be combined with an experimental set in a grid if the treatment is intended to operate on them directly—for instance if it is to relieve free-floating anxiety or depression.

It is not sufficient just to keep to the same constructs, and to allow the elements to vary when monitoring changes during the course of a treatment intended to operate on an experimental set of constructs, for then any variation among the grids may be attributed to differences between the elements and does not necessarily imply any changes in the use of the constructs.* And conversely, it is not sufficient just to keep to the same elements and to allow the constructs to vary when the treatment is intended to operate on experimental elements. Even when both the elements and the constructs are the same at every trial the variation between the trials may be attributed *either* to changes in the applications of the constructs *or* in the evaluations of the elements, as the record is of their interactions. The results must be examined to see whether the differences between the experimental and control elements are more clear-cut, and the apparent changes in the use of the constructs can be regarded as consequential; or whether the reverse is the case.

7. *Grids in series*

The analysis of a series of grids as a whole presents more than just a single methodological problem. It opens up a vast, almost entirely unexplored range of problems, with limits that are not yet discernible. A strategy for exploring the whole range could be outlined but even an outline is beyond the scope of this review. The first problem encountered concerns the self-identity of a construct which gives different results when applied to the same elements on different occasions, or of an element which is evaluated differently in terms of the same constructs. One may postulate self-identity in the elements, leaving the self-identity of the constructs open to doubt, or vice versa. Or one may treat the constructs, the elements and the occasions as defining a fixed frame of reference within which the variations of a three-way interaction system are observable.

Collecting the grids is no problem at all. It can be done within a clinical setting. A series of grids can be obtained from one patient during a course of treatment. A series of sets of grids, indeed, can be obtained, by collecting grids at intervals from all the patients receiving a course of group psychotherapy together. Market research is another setting where large collections of grids have been accumulated, usually in the semantic differential form.

In principle it may seem a pity that the confidential nature of the subject-matter in market investigations prevents information about the methods used from becoming generally available.

* This comment applies to Bannister's measure of consistency, the "construct pattern reliability estimate", cf. p. 168. A series of grids obtained by applying the same constructs to different sets of elements can always be analysed as one extended grid in accordance with the hypothesis that all the constructs have been used perfectly consistently throughout the series. Consequently Bannister's formula is open to the theoretical objection that it is not a valid measure of consistency (or rather, inconsistency). But regarded simply as an arbitrarily defined property of a grid separated into two parts by element it is not open to any fatal practical objections if it is valid for certain purposes, e.g. diagnosing schizophrenia.

But whether much of it would be found interesting is very doubtful. The subject-matter, though so confidential, will usually be trivial and uninteresting to people without any capital investment at risk; and the haste with which the results are required tends to perpetuate crude well-tried methods of analysis and discourage methodological research.

Data of such a kind, collected by Research Services Ltd. for the Church of England Youth Council, were analysed by the M.R.C. service and the results are available in a report (Field and Slater, 1967) with an unrestricted circulation. The programme used extends the maximum number of elements to 100 and the number of constructs practically indefinitely. The correlations between them are not listed—the list might be too long to look at—but co-ordinates, including polar co-ordinates are given for mapping their scatter and showing the clusters they form in the element space. The elements can also be projected on to the same map. (In market research terms, this would show what is the distribution and nature of the total demand for a range of products, how far the products cover or fail to cover it and what their brand images are, including what would be the proper brand images for additional products that might be introduced into the range to cover unsatisfied regions of effective demand.)

Another programme dealing with a practically unlimited number of constructs sorts them into any subsets specified, measures how closely the ones in the same subset cluster together, and how far the subsets separate from one another. It is at present being used by the University of Sussex Student Health Service.

There are various other programmes in course of development or receiving experimental trials. But the only one which is already in regular use is a relatively simple one, DELTA, which compares two grids with the same constructs and elements—typically two grids obtained from the same patient at different times during a course of treatment—forms a grid of differential changes, shows how each of the constructs and elements has been affected and defines the major directions in which changes have occurred. If desired, it can be escalated: three successive grids can be used to form two grids of first-order differential changes, which can again be compared, to analyse changes in the directions of change. This could be useful in cases where a relapse has followed a temporarily successful treatment. When DELTA has been used simply to compare test–retest results, it may show that one or two of the constructs or elements are much less stable than the rest, as if the particular constructs do not properly belong to the same subsystem, or the particular elements in the same range of convenience as the rest. In a thorough, detailed individual study test–retest changes might be compared with changes during treatment.

Within the limits of her housekeeping money and the tastes of the family she has to cater for a housewife is free to choose her grocery from an enormous range of products offered for sale. In planning their production and advertising manufacturers, practical men, assume without question that their customers enjoy some freedom of choice. But among scientists determinism is traditional, and most comprehensive psychological theories are ill-equipped for discussing the phenomena of free choices. Psychoanalysis visits the sins of the children upon their parents, stimulus invariably evokes response in the ideal experiment of the behaviourist, trait psychology aims at improving psychometric measurements to the point when all human behaviour will become predictable by computer. Every theory seems determined to allow no room for initiative and acceptance of responsibility, except the theory of personal constructs. It concentrates on exploring ranges of choice open to an individual. In the clinical situation it offers him opportunities for discovering ways out of his psychological predicament other than retreat into mental disorder. This concern with the phenomena of free choices is perhaps what makes the theory seem excitingly different and attractive to some psychologists, and perhaps also explains why the grid technique, which serves to describe the scope for choice and change open to an individual, is so readily transferable from clinical studies to market researches and opinion surveys.

One of the most interesting studies of a series

of grids reported by Bannister and Mair is of this kind. It is an investigation by Fransella and Bannister into the opinions of people making different electoral choices. Although they discuss their results only in terms of correlations between constructs they have contrived to extract some evidence of interactions. They found for example that the constructs "proud of being British" and "prejudiced" had a non-significant negative correlation among Conservatives and a significant positive correlation among Labour supporters.

The most important, perhaps, in the authors' miscellaneous collection of experiments involving series of grids are the ones which have now resulted in the publication of the Grid Test of Schizophrenic Thought Disorder, by Bannister and Fransella (1967). This is described officially and correctly as a standard test.

All the series studied have been formed by giving similar or identical grids to different subjects. In nearly all, the elements—photographs of unknown people, names of common physical objects, etc.—have been supplied. In many of them the constructs are supplied also. Properties such as "Complexity", "Simplicity", "Intensity", "Consistency", "Insight" and "Social Deviation", are measured by scoring formulae which are arbitrary though they have some psychological rationale (some, e.g. "Intensity" and "Simplicity", approximate to essential or derived properties of the grids). The procedure in the experiment is thus fairly well or completely standardized and the end product is a set of measurements of individual differences. Some diagnostic or predictive applications, important or slight, may be found for them.

Although such measurements may well have some psychological value, there is no limit to the possible increase in the number of them that can be germinated in the same area by excogitating rather different rationales and formulae. "The inevitable terminological jungle" develops, as the authors remark with reference to diverse measures of Complexity and Simplicity.

And methodologically, on the other hand, they are barren. They subordinate grid technique to trait psychology instead of developing it independently as an instrument for recording phenomena beyond the reach of other available techniques.

References

Bannister, D., and Fransella, Fay (1967). *A Grid Test of Schizophrenic Thought Disorder: A Standard Clinical Test.* Barnstaple: Psychological Test Publications.

Field, J. G., and Slater, P. (1967). *Training Christians: a Psychometric Study. Report No. J.4834/JGF.* London: Research Services.

Kelly, G. A. (1955). *The Psychology of Personal Constructs.* New York: Norton.

Marks, I. M. (1966). "Semantic differential uses in psychiatric patients." *Brit. J. Psychiat.*, **112**, 945–51.

—— Gelder, M. G. (1967). "Transvestism and fetishism: clinical and psychological changes during aversion." *Ibid.*, **113**, 711–28.

May, A. E. (1968). "An assessment of homicidal attitudes." *Ibid.*, **114**, 479–80.

Osgood, C. E., Suci, G. J., and Tannenbaum, P. H. (1957). *The Measurement of Meaning.* Urbana: University of Illinois.

Ryle, A. (1967). "A repertory grid study of the meaning and consequences of a suicidal act." *Brit. J. Psychiat.*, **113**, 1393–403.

Slater, P. (1964). "Specific factors and minor components." *Brit. J. Psychol.*, **55**, 254–66.

—— (1965). "The use of the repertory grid technique in the individual case." *Brit. J. Psychiat.*, **111**, 965–75.

Patrick Slater, M.A., Ph.D., *Senior Lecturer in Psychological Statistics, Institute of Psychiatry (University of London), De Crespigny Park, London S.E.5*

(*Received 23 October 1968*)