PSYCHOMETRIKA—VOL. 26, NO. 1
MARCH, 1961

# PSYCHOMETRICS—A SPECIAL CASE OF THE BRAHMAN THEORY

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We are gathered today to commemorate the completion of the first quarter of a century of the Society's history, and I consider it no small honor to have been selected to address this distinguished group on this memorable occasion. When Dr. Charles Wrigley, Chairman of the Program Committee, extended the invitation, he expressed the hope that I would review the history of the formation of the Society and discuss something of its achievements to date. Today I shall only highlight the early history of the organization, since in my Presidential Address in September 1941 a rather full history was presented.

The policy and philosophy laid down initially have, in my opinion, proved sound over the past quarter century. Careful re-examination convinces me that these will be sound not only for the next quarter century, but probably for the next century as well. It is my firm conviction that the Society and the Corporation through the Journal, *Psychometrika*, have made a substantial contribution to psychology. It is proper, however, and perhaps timely to re-examine our past contributions to psychology and society and perhaps to question whether we have become stagnant or made fully the contribution envisaged by the founders. Before reviewing our contribution, it might be wise to review briefly the early history of these organizations.

*1931*

Dr. A. P. Horst was attempting to buy or form a journal to be devoted to quantitative methods as applied to education and psychology.

*1932*

Horst interested his associate, Dr. A. K. Kurtz, in the need for such a journal and they began preliminary correspondence with other psychologists interested in quantitative applications.

*1933*

Horst and Kurtz discussed the problem at great length with Drs. L. L. Thurstone and Marion W. Richardson. The idea appealed strongly to Thurstone and won his enthusiastic support without which it is doubtful success

would have crowned Horst's efforts. Richardson's interest in theoretical problems of test construction assured his support. The speaker was approached because of his knowledge and the volume of technical material available to him as editor of the *Journal of Educational Psychology*, the only outlet of consequence at that time for such articles.

*1934*

Thurstone became quite active in advising on the details of establishing such a journal and made a number of attempts to secure support from foundations, but without success. Horst, Kurtz, Richardson, and Stalnaker developed details as to costs, prospective publishers, policies and methodologies. At the fall meeting of the American Psychological Association, these men met with the speaker in a series of conferences, and became a firmly knit group determined to establish the new Journal. Kurtz emphasized that the readers of the Journal would be interested in forming a society, since this would identify individuals with common interests, focus attention on the need and importance of developing a quantitative rationale for psychology, provide a mechanism for physical meetings and, perhaps most important, provide financial support for the Journal.

*1935*

Thurstone made it possible through contributions of his own and his staff's time and facilities to canvass biometricians, educators, psychologists, and statisticians as to their interest in the proposed Society and Journal. Invitations were extended to all who replied, to attend the formation of the Society on September 4, 1935, during the annual meeting of the American Psychological Association. The new Psychometric Society was formally affiliated with the APA at the annual meeting later that week.

Temporary officers had been appointed at the formation meeting, and subsequently ballots were mailed out for election of officers. Thurstone was elected President; Horst, Secretary; and the speaker, Treasurer.

*1936*

A committee composed of Horst, Kurtz, and Richardson prepared the constitution for the Society, and it was adopted at the Dartmouth meeting in September. There was still no capital for starting the Journal. The speaker had estimated publication costs as approximately a thousand dollars a year, which subsequently proved approximately correct. Suddenly, shortly after the beginning of 1936, Horst, impatient with the delay and with confidence in the future, offered to underwrite the losses of the Journal for the first year up to one fourth of its cost. This example was immediately followed by Kurtz, Richardson, and E. L. Thorndike and, so as not to appear too nig-

gardly, Dunlap. Somehow the word got about as to the plans for initial financing of the Journal and it was only a very short time until pledges of support had been received from Guilford, Gulliksen, Kuder, Lorge, and Stalnaker. I might add these loans were repaid by September 1941.

With sufficient funds to underwrite the publication of the Journal for a year and a half, the project moved ahead rapidly. In July 1936, Thurstone wrote the speaker as follows:

"We have been discussing the relation of *Psychometrika* to the Psychometric Society. It seems best to organize the Psychometric Corporation whose principal function would be to publish the Journal. Members of the corporation would be those who had made some contribution for its support.

"The principal reason why we suggest the Psychometric Corporation as the owner and publisher of the Journal is that the objectives of the Journal should be maintained. There is, of course, some possibility that the popular control of *Psychometrika* might change its character in a few years to a popular mental test Journal. This is, of course, not our principal objective and it seems best therefore to place the ownership and control of the editorial policies in the hands of the initial group with such additions as they may elect. Eventually we might have to make some compromises in the direction of popular mental test material, but such questions of policies should be in the hands of those who initiated and sponsored the Journal financially rather than in the hands of popular vote. This is what we have in the back of our minds in arranging for a partial separation in controlling the Journal."

On July 25, Dr. Thurstone sent the following instructions to the lawyers.

1. The members of the Psychometric Corporation shall be members of the Psychometric Society.
2. The initial members of the Psychometric Corporation are:

| | |
|---|---|
| Jack W. Dunlap | Albert K. Kurtz |
| J. P. Guilford | Marion W. Richardson |
| Harold O. Gulliksen | John M. Stalnaker |
| Paul Horst | L. L. Thurstone |

3. New members are to be elected by three-fourths majority of the membership.

The Psychometric Corporation was incorporated in the State of Illinois on August 24, 1936. At the September meeting of the Corporation, Kuder, Rulon, Lorge, and Thorndike were elected to membership.

In concluding the early history of the Society and the Corporation, I must touch on a sad note. Three of our first Presidents—Dr. L. L. Thurstone, Dr. Edward L. Thorndike, and Dr. Karl Holzinger—are no longer with us. Individually and as a Society, we owe a great deal to these distinguished leaders in our fields for the encouragement, stimulation and direction they gave. The fifth President, Dr. J. P. Guilford, is with us

today, and I am pleased to announce the sixth President is still around.

While the Journal proved a financial success from the beginning, all was not well with the Society. The Society was barely able to get sufficient papers in 1940 to hold a program at the annual meeting, and in 1941 it had to forego a program for lack of papers. In the Presidential address that year, I raised a series of sharp questions to the membership and indicated a number of areas in which work was badly needed. Despite the fact that we were shortly engaged in World War II, the membership responded and the Editors were able to publish the Journal throughout the war.

It would be well now to review again the objectives laid down by the founders of the Society and to examine how well they built. On the inside cover of the first issue of the Journal the following statement appeared.

The Psychometric Corporation was organized for the purpose of sponsoring and publishing a professional journal on the following subjects.

1. The development of quantitative rationale for the solution of psychological problems.
2. New mathematical and statistical techniques for the evaluation of psychological data.
3. Aids in the application of statistical techniques, such as nomographs, tables, worksheet layouts, forms, and apparatus.
4. Critiques or reviews of significant studies involving the use of quantitative techniques.
5. General theoretical articles on quantitative methodology in the social and biological sciences.

In the June 1960 issue, these same five objectives were re-affirmed on the masthead as the continued philosophy of the Psychometric Corporation.

In an effort to determine how successfully the policies have been maintained over a quarter of a century, I reviewed the four issues of Volume 1 and the last two issues of Volume 24 and the first two issues of Volume 25 of *Psychometrika*. I then classified the articles as to the five basic objectives set forth above, with the following results. No claim is made as to the accuracy of classification, but at least the material in all issues was classified against common criteria by a single rater.

| | Vol. 1 | Vol. 24, Vol. 25 |
|---|---|---|
| Development of quantitative rationale | 7 | 11 |
| New mathematical and statistical techniques | 16 | 13 |
| Aids in application of statistical techniques | 3 | 5 |
| Critiques of significant studies | 1 | 2 |
| General theoretical articles | 3 | 0 |
| Total | 30 | 31 |

Casual examination indicates there has been little, if any, shift in the distribution of articles appearing in the Journal over a quarter of a century. Clearly, we have achieved one of the goals set forth in Dr. Thurstone's

letter of July 1936. There is, however, one disturbing element in this table, namely, the paucity of basic theoretical articles.

For several years now I have had the impression that the Journal was becoming stagnant, limited in authorship, and extremely narrow in its concept of what constitutes the development of quantitative rationale for the solution of psychological problems. Perhaps this impression stems from the rigidity that comes with age. In order to test this impression, I developed a list of thirteen topics which, after discussion with others, seem appropriate subjects for publication in the Journal and areas of possible research for the membership of the Society. Twenty issues, published from 1955 through 1959, were examined and the articles classified according to topic. The results are set forth below.

Nature of articles published in *Psychometrika*—1955 through 1959

| | |
|---|---|
| Statistics of tests and measurements | 65 |
| Factor analysis | 34 |
| Statistics—general | 24 |
| Mathematical models of human behavior | 16 |
| Test theory | 8 |
| Learning theory | 8 |
| Game theory | 1 |
| Information theory | 1 |
| Detection theory | 1 |
| Communication theory | 0 |
| Decision theory | 0 |
| System theory | 0 |
| Servo theory | 0 |
| Total | 148 |

The average number of articles is 29.6, almost identical with the number in Volume 1. The cover of the Journal is unchanged, the format unchanged, and the nature of the contents interchangeable with those of Volume 1. I might add that eight of the original editors are still on the editorial board. Clearly, the fear expressed in Dr. Thurstone's letter of July 1936 that the Journal might become a popular mental test journal has not materialized. In view of Drs. Thurstone's and Horst's sensitivity to new frontiers, it is interesting to speculate as to their reaction to the fact that the Journal still devotes two-thirds of its space to articles on the statistics of tests and measurements and factor analysis.

True, the Journal and the Society have escaped the "fate worse than death" of becoming a popular mental test journal, but perhaps we have fallen victim to an equally deplorable fate of being a "popular test journal."

Surely it is apparent by now that the Psychometric Society and the Journal are classic examples of Brahman theory.

When Paul Horst and Marion Richardson came riding out of the West to the meeting in the fall of 1934 with the dream of establishing a journal for the development of quantitative rationale for the solution of psychological problems and for general theoretical articles on quantitative methodology in the social and biological sciences, it is doubtful they envisaged factor analysis and the statistics of tests as the "sine qua non" of psychology, nor do I believe this was the belief of the other six founders. Today, the form and the ritual remain, but the spirit of developing new frontiers is no longer apparent in the pages of the Journal. We have become complacent, perhaps authoritarian, and unimaginative in our approach to new opportunities in developing a quantitative science. We need new blood, new ideas, and the audacity of youth to lead us in the further development of our science. We cannot view lightly that some of the most important developments in recent years in the field of quantitative psychology have been made by persons who have been trained primarily in physics and mathematics, as exemplified by the contributions of Robert Bush and Fred Mosteller.

In the July 14, 1960, issue of *The Listener*, an English publication, George Steiner wrote a shocking indictment of psychometrics.

Vehement Obscurity

> Finally there are those pursuits that call themselves, significantly, the social sciences. As practised by their exponents, particularly in Germany and America, they are largely illiterate or anti-literate. Their papers and books are written in a jargon of vehement obscurity. Wherever they can, they replace the verbal concept with the mathematical or statistical expression, the curve, the graph. Where they cannot, they inject into language pseudo-words borrowed from the exact sciences ("norms," "group," "scatter," "functions," "integrations"). All these are words with a specific mathematical or notational content. Emptied of it they become the pretentious, deceptive jargon of the American sociologist, and in using such jargon he pays eloquent tribute to the fact that all exact knowledge must seek to assume the respectability of the natural and mathematical sciences.

Perhaps the social sciences deserve this blast, but I am convinced Steiner overstated his case. Nevertheless, his remarks should stimulate us to review our work.

There are a number of areas notably absent from *Psychometrika* which, in practice, appear to fall squarely within its stated realm of developing quantitative rationale and general theoretical articles on quantitative methodology. Consider, for example, information theory which permits us to describe quantitatively the rate at which man processes information. Only one article has appeared in *Psychometrika* on this very important area of human activity. True, there are limitations to the technique, but there are some strong advantages in using this technique to describe one aspect of human behavior. The problem of describing the behavior of man in continuous control tasks, where he is constantly receiving inputs and his outputs are

attempts to correct the inputs, is dealt with in servo-theory but no articles deal with this important area.

The problems of risk-taking by individuals and groups are real life problems, but only one article has appeared in the Journal on game theory. Nevertheless, the applications of human game playing in both military and management games are well known and certainly deserve consideration under the statement of principles to which we have rendered lip service for a quarter of a century.

In the last five years, only eight articles have appeared in the Journal which could be classified as mathematical models of human behavior, and only one each in the important areas of human behavior of game theory, information theory, and detection theory.

One of the most important aspects of human behavior is communications; yet no attention has been paid to problems of network theory, cybernetics, the signal-to-noise problems, or of how man functions in a communication channel. Closely related are the very real problems of detection theory as exemplified in discrimination, vigilance, and signal detection in the presence of noise, but detection theory has been ignored by psychometricians.

Man is constantly confronted with the necessity of making decisions. Even now many of you are contemplating the choice of "Shall we hear him out or throw him out?" Quantitative methods and stochastic models have been developed by others regarding the theories of decision-making; yet we appear to ignore sedately this important aspect of human behavior.

It is only in the field of mathematical and mechanical models of human behavior that we have been willing to stray from the narrow and rigid pattern set by the first few years of publication. Nowhere in the last five years did I find an attempt to apply queueing theory or linear programing and only one instance of the application of Monte Carlo theory. True, none of the above areas may be worthwhile for developing a quantitative rationale for psychology, but they surely deserve exploration. The least we could have done was to have prepared critiques of significant studies using quantitative techniques.

The basic objectives of the Society and the Journal are, I repeat, as sound today as they were when they were formulated more than a quarter of a century ago. I do not contend for a moment that we should do away with articles dealing with statistics of tests or of factor analysis, but rather we should consider modifying the "mix" of articles to encompass a broader concept of the development of a quantitative rationale for our field. We would be well advised, in my opinion, to forego the Brahman theory* and begin to search actively for articles on these newer techniques and approaches, and to contemplate seriously bringing into the Society, the Corporation, and onto the editorial board of the Journal, able and brilliant younger scientists. In concluding this address to this distinguished group I propose the question, "Whither now, O sacred cow?"

*The theory, held by many, that the cow is sacred.