

# **THE ESSENTIALS OF MENTAL MEASUREMENT**

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The essentials of mental measurement by William Brown & Godfrey H. Thomson

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**WILLIAM BROWN & GODFREY H. THOMSON**

**THE ESSENTIALS OF  
MENTAL  
MEASUREMENT**



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THE ESSENTIALS OF  
MENTAL MEASUREMENT

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# THE ESSENTIALS OF MENTAL MEASUREMENT

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# THE HISTORY OF THE

## ROYAL SOCIETY OF LONDON

### FROM ITS ORIGIN TO THE PRESENT

BY JOHN HENRY MADDISON

IN TWO VOLUMES

VOLUME I

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1926

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## PREFACE

### I

NUMEROUS changes, in the form of additions, omissions, and alterations, have been made in this edition. Chapters I, V and VI remain with little alteration, Chapters III and VIII have been expanded and altered, while Chapters II, IV, VII, IX and X are entirely or almost entirely new. These changes are wholly the work of Professor Godfrey H. Thomson, and the merit of the very great improvement in the book is due to him. Owing to my own time during the War being taken up entirely with army medical work, I have been unable to take any part in the further development of correlational psychology since 1914, and it was therefore a very great relief to me when Professor Thomson kindly offered to cooperate in bringing out a second edition of *Mental Measurement*. No one could have been more fitted for this task, both on the mathematical and on the psychological side, and he has produced what is in half its extent a new book, vastly superior to the old. Some of the sections are purely mathematical, and these will perhaps appeal to a wider circle of readers.

As this second edition, like the first, is opposed to the theories of Professor C. Spearman, I wish to take the present opportunity of saying that as an opponent I have learnt to respect and admire his work to a very great degree, and looking back dispassionately over six years spent in other forms of psychological research, I find myself more convinced than ever that his work in correlational psychology is epoch-making in its significance. Although I have found no occasion to withdraw any of my own earlier criticisms, I have gladly taken the opportunity of modifying the wording in many respects, in order to do better justice to the outstanding importance of his views. Whatever may be the ultimate verdict on the significance of "hierarchical order"



in groups of correlation coefficients, Professor Spearman's correlational work in other directions would alone justify his unique position in the domain of statistical psychology.

It has seemed to me to be essential that Professor Thomson should contribute a separate preface, since so much of this edition is concerned with the vindication of a theory which originated from his brain alone. Should a third edition be called for later on, I hope to be able to add a "Part III," summarising results and theories in non-mathematical language. But at present the battle rages so hotly that this is not desirable, even if it were possible.

W. B.

KING'S COLLEGE,

LONDON.

*August, 1920.*

## II

Dr Brown's suggestion that we should write separate prefaces to this book appeals to me for one reason only, that it enables me to shoulder, myself, the responsibility for any errors either in principles or in detail which this edition may contain. Any credit I am glad to share, but the faults are my own.

The book is necessarily concerned largely with controversial matters. On one of these, the question of the validity of the reasoning which Professor Spearman has based on the occurrence of hierarchical order, I am entirely convinced that the situation is as described in Chapters IX and X. My position is that hierarchical order is the natural order among correlation coefficients, that it only expresses the well-known fact that correlation coefficients are themselves correlated, and that the degree of perfection of hierarchical order found among psychological correlation coefficients is merely that which occurs by chance, and not, as Professor Spearman has been led to believe, extraordinarily high.

On this point, then, I feel certain that Professor Spearman has drawn over-hasty conclusions, conclusions which may be, by a fine instinct,

the true conclusions, but conclusions which are totally unsupported by the "hierarchy" argument.

On a second point at issue, however, namely the question of the use of ranks instead of measurements in calculating correlations, I feel much less competent to speak. There is a good deal to be said on both sides. The crux of the question to my mind is this. Admittedly the form of distribution of any set of scores in a mental test is not necessarily identical with the distribution of the true scores in mental units. If we give up the actual scores and merely retain the order of merit we are, it would seem, only giving up a false claim to accuracy and restricting ourselves to what we are certain of. But when we come to perform the actual calculations we find that we are again assuming a form of distribution of the mental quantity, usually a normal distribution, but sometimes some other, as in the "Foot-rule." It comes therefore to this, that in calculating rank-correlations we are refusing to take the distribution found and are substituting for it one not found. The question then is whether it is more probable that the assumed or the measured distribution corresponds to the actual unknown mental distribution. I think that each case would have to be taken on its merits: but I do feel that in the actual measurement the attempt should be made to approximate to the true distribution, by comparing *differences* carefully, as I suggest on pp. 11—12.

However, I wish to make it clear that there is not, on this question of the use of ranks, that sharp cleavage of opinion between Professor Spearman and myself which cannot be disguised in the case of the General Factor argument.

A third question is that of the correction of raw correlation coefficients, in which I share to a considerable extent Dr Brown's misgivings as to Professor Spearman's formula, and on which Dr Brown has, since the first edition of this book, added experimental evidence as to that correlation of errors and true values which the Spearman formula assumes to be zero (see pp. 160—3).

My thanks are due to the President and Council of the Royal Society, and to the Editors of the *British Journal of Psychology*, the *American*

*Journal of Psychology*, the *Psychological Review*, and *Biometrika*, for their kind permission to reproduce long extracts from articles in the publications controlled by them: to Professor F. M. Urban and his publisher Mr W. Engelmann for permission to print Urban's Tables for the Constant Method: to Dr E. G. Boring of Clark University for valuable suggestions: to Dr G. J. Rich for his permission to print his checking table: to my colleague Dr G. R. Goldsbrough for reading some mathematical pages of the proofs: and to Professor Spearman for reading the proofs from p. 65 onwards, and the MS. of this preface. Acknowledgments to authors cited are made by footnotes, but should any omission in this or any other respect have occurred, my sincere apologies are tendered for the mistake.

I have welcomed the opportunity which this book has afforded of printing in one volume arguments which, after a delay due to four years' military service, I was compelled to publish piecemeal, during 1919 and the earlier months of the present year, in various scattered papers: and I would like finally to thank Dr Brown himself for permitting his book to be thus mauled by another and will close as I began by begging that none of my crimes may be visited on his head.

G. H. T.

ARMSTRONG COLLEGE,  
NEWCASTLE-UPON-TYNE.  
*August, 1920.*