

Instrument Development in the Affective Domain

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Instrument Development in the Affective Domain

School and Corporate Applications

Third Edition

 Springer

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ISBN 978-1-4614-7134-9 ISBN 978-1-4614-7135-6 (eBook)
DOI 10.1007/978-1-4614-7135-6
Springer New York Heidelberg Dordrecht London

Library of Congress Control Number: 2013934719

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Printed on acid-free paper

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To my Siegles: Del, Jessica, and Del

D. B. M.

*To my loving wife and family: Kathe, Rick,
and Kathe*

R. K. G.

*To Whitney, Ethan (JEM) and Maeve
(Maeveen)*

J. P. M.

Foreword

There has been longstanding interest in affective characteristics in both educational and corporate environments. While each domain has produced its own set of theorists and researchers, the work of some, such as Bandura, has found a place in the literature of both areas. In each of these settings, theorists and researchers have agreed on the causal connections between such constructs as self-efficacy and perceived satisfaction and success, whether that success is measured by academic achievement or corporate quality and performance resulting in profitability.

Along with this interest, comes the need for the development of valid and reliable instruments to assess affective characteristics. It is clear that no matter whether your interest lies in the relationship between self-efficacy and academic success or employee satisfaction and corporate success, it is essential that the instruments used be carefully designed and tested to assure that they are measuring what they are intended to measure in a consistent manner. This work offers the theoretical perspective, modern psychometric techniques, real examples, and data needed to enable the instrument developer to produce such valid and reliable instruments.

While the development process changes very little as one goes from the educational to the corporate domain, the inclusion in this edition of specific corporate-based theories and research examples as a complement to the academic-based examples greatly enhances the relevance of this book for those of us concerned with the effects of affective variables in the workplace. For anyone involved with the development of instruments to measure these variables, this book should prove a necessary resource. With today's emphasis on quality, this book provides the road map and background to accomplish measurement with the certitude that quality demands.

Joseph W. Keilty
Former Executive, Vice-President
Quality and Human Resources
American Express Company

Preface

Over 20 years ago, Bob Gable (and Marian Wolf) authored the second edition of *Instrument Development in the Affective Domain*, and it quickly became a cherished book for researchers in education, business, and the social sciences who needed to create multi-item self-report instruments. Five years later, a much younger Betsy McCoach enrolled in Bob Gable's instrument design course, and it changed her life forever. Falling in love with latent variables and structural equation modeling in the fall (thanks to Dave Kenny) and the measurement of affective constructs in the spring (thanks to Bob Gable!), Betsy spent 15 years engaging in teaching, researching, and applying these techniques to the development of affective instruments. After Bob Gable retired from the University of Connecticut, Betsy continued to teach his legendary instrument design course, each year adding additional material (much to the dismay of her graduate students!). The revision of this book grew out of Betsy and Bob's respective instrument design courses and projects over the last decade, and Betsy was thrilled when Bob agreed to collaborate on a long overdue revision of the classic. In the spring of 2011, a first year graduate student entered Betsy's instrument design class, just as she had entered Bob's class a dozen years before. John developed the same passion for latent variables and instrumentation that Bob and Betsy had, and soon after, he became the third of the collaborators on this new edition of *Instrument Development in the Affective Domain*. Thus, this book represents three generations of Instrument Design: a professor, her mentor, and her mentee. Our goal was to capture some of the magic of the instrument design course and package it, with the hope that it will inspire you, the reader, to engage in the instrument design journey with the passion and dedication that we feel toward the subject.

Instrument design is both art and science, both qualitative and quantitative, both conceptual and methodological, both holistic and technical, driven by both substantive theories and empirical outcomes. It is this dualism that makes the study of affective instrument design such an exciting and rewarding area, and we have tried to capture this dualism within this text. The first three chapters are quite conceptual; the following four chapters are more methodological. However, throughout the book, we have maintained a very applied, very conceptual orientation to the material. Therefore, the book requires little prerequisite knowledge in

statistics, although a healthy grasp of correlation and regression would certainly aid students' grasp of the contents in [Chaps. 4–7](#).

This book is designed for use in graduate coursework in instrument design in the affective domain or as a stand-alone guide for a researcher or evaluator who needs to develop multi-item scales to measure affective traits. Given that 20 years have elapsed since the second edition of this book, this version represents a complete revision of the text. [Chapter 1](#) provides a brief conceptual introduction to the affective domain. [Chapter 2](#) presents an overview of measurement, scaling, and item writing techniques. [Chapter 3](#) introduces the concept of validity and discusses issues related to collecting validity evidence-based on the content of the instrument. [Chapter 4](#) introduces the reader to exploratory and confirmatory factor analyzes as analytic methods to probe the internal structure of the instrument. [Chapter 5](#) presents latent class analysis, Item Response Theory, and Rasch Modeling as additional methods for examining the internal structure of the instrument. [Chapter 5](#) also includes an introduction to measurement invariance. [Chapter 6](#) discusses a variety of ways to buttress the validity argument for the instrument by examining relations to external variables. [Chapter 7](#) focuses on issues related to reliability. Finally, [Chap. 8](#) concludes with a summary of the major steps in the instrument design process.

The book outlines a systematic approach to tackle the instrument design process and provides guidance on most aspects of the process. We hope that this book provides guidance and inspiration, but no one text can cover all topics related to instrument design in a completely comprehensive fashion. Thus, in that sense, this is an introductory text for a multi-faceted topic, rather than an encyclopedic volume on all topics related to this area. Our greatest wish is that you fall in love with instrument design the way that we have and that find the process and the book enjoyable as well as informative.

D. Betsy McCoach
Robert K. Gable
John P. Madura

Acknowledgments

There are so many people who have helped make this book possible. First, we want to thank Glen Davenport, Sarah Newton, and Kristyn Michaud, who all provided much needed editorial assistance. We also want to thank Mariya Yukymenko and Melissa Eastwood, who helped gather the literature for the update and Jessica Goldstein, who helped to develop some of the material on Latent Class Analysis that we use in this book. Thank you to the University of Connecticut for granting the first author a sabbatical leave in the Spring of 2010 to work on the manuscript. Thank you also to the National Research Center on the Gifted and Talented for supporting the first author throughout this process. Of course, all opinions contained in the book represent our own, and are in no way representative of the NRCGT, IES, or the Department of Education. However, the support that they provided during this process was invaluable. Thanks also to our colleagues at the University of Connecticut- Megan Welsh, Chris Rhoads, Swami, and Jane Rogers and all of the graduate students in the Measurement, Evaluation, and Assessment program for their support throughout the process. Thank you to the best Department Chair an Educational Psychology Department could ever have—Del Siegle, for his professional and personal support. We (especially the first author) could not ask for a better Chair and boss! We are also indebted to the hundreds of students who have taken instrument design courses at the University of Connecticut over the last 20 years. Their work has both fueled and informed this revision. Thank you to Rachel McAnallen for allowing us to use an adapted version of her data for our factor analysis examples.

We wish to thank our families, who sacrificed a great deal for the sake of this book. Countless early mornings and weekends at the office have made “the book” a legendary and mythical creature at the first author’s house, second only to Santa Claus. In particular, the first author wishes to acknowledge the efforts of her husband Del, who became a single parent in the mornings for the sake of the book, an even more heroic act given that he has books of his own to pen. She also wishes to thank Jessica, Del, Mom, Melissa, Nikki, Susannah, Catherine, Ann, Dave, Brandi, Megan, Mike C., John S., and everyone else who provided physical

and moral support throughout this process. Finally, she wishes to thank Sally Reis, her major advisor, who has provided invaluable mentorship, both academically and personally, and who serves as her role model for pursuing a successful academic career as a mother.

Contents

1	Affective Characteristics in School and Corporate Environments: Their Conceptual Definitions	1
	What is an Affective Instrument and Why are We Designing One? . . .	1
	School and Corporate Environment	2
	What are Affective Characteristics?	6
	Types of Affective Characteristics	7
	Relationships Among Affective Characteristics	25
	References	26
2	Defining, Measuring, and Scaling Affective Constructs	33
	Latent Constructs and Measurement	34
	Measuring Affective Characteristics	39
	Scaling Techniques	41
	Likert's Summated Rating Scale Technique	48
	The Semantic Differential Scale	53
	Rasch Model	57
	Issues to Consider When Developing Multi-Item Measures	60
	Indirect Measures of Affective Characteristics	77
	Summary	81
	References	82
3	Evidence Based on Test Content	91
	Defining Validity	91
	Validity Evidence	94
	Evidence Based on Instrument Content	94
	Summary	105
	References	106
4	Evidence Based on the Internal Structure of the Instrument:	
	Factor Analysis	109
	Factor Analysis	109
	Exploratory Factor Analysis	114

Confirmatory Factor Analysis	145
Treating Item Responses as Ordinal: Exploratory and Confirmatory Factor Analyses.	157
Conclusion	158
References	159
5 Additional Evidence Based on the Internal Structure of the Instrument.	163
Latent Class Analysis.	163
Item Response Theory and Rasch Models	176
Construct Invariance	191
References	205
6 Evidence Based on Relations to Other Variables: Bolstering the Empirical Validity Arguments for Constructs	209
Definition	209
Evidence Based on Discriminant and Convergent Relations	210
Test Criterion Relationships	233
Integrating Validity Evidence	244
References	244
7 The Reliability of Scores from Affective Instruments.	249
Reliability Theory	250
Types of Reliability Coefficients	254
Factors Affecting Internal Consistency Reliability	264
Stability Reliability	267
Acceptable Levels of Reliability	268
The Relationship of Reliability to Validity	269
Computer Output: Cronbach’s Alpha Internal Consistency	271
References	276
8 Review of the Steps for Designing an Instrument	277
Major Steps in the Instrument Development Process	277
Final Thoughts	283
References	284
Permissions	285
Appendix A: Content Validation Baslanti and McCoach.	287
Appendix B: Full AMOS Output for CFA Example (Chapter 4).	291
Index	305

Authors' Biography

Dr. D. Betsy McCoach, Ph.D., is an Associate Professor in the Measurement, Evaluation, and Assessment program at the University of Connecticut, where she teaches coursework in structural equation modeling, multilevel modeling, and instrument design. Dr. McCoach is the current Director of the *Data Analysis Training Institute of Connecticut* (DATIC), housed in the Educational Psychology Department of the Neag School of Education at UCONN. DATIC offers week-long summer workshops in advanced modeling techniques to researchers, professors, and graduate students who wish to learn to utilize techniques in their own research. Dr. McCoach co-teaches a week-long workshop (with Ann O'Connell) on hierarchical linear modeling also teaches the week-long workshop on Structural Equation Modeling. In addition, Dr. McCoach is the Founder and Program Chair of the *Modern Modeling Methods Conference*, hosted at the University of Connecticut every May.

Dr. McCoach has extensive experience in hierarchical linear modeling, and has used multilevel modeling techniques to analyze large national datasets. She and Ann O'Connell co-edited a book, *Multilevel Modeling of Educational Data*, available from Information Age Publishing. In addition, Dr. McCoach also has extensive experience in the areas of instrument design, factor analysis, structural equation modeling, and longitudinal analysis. Dr. McCoach has published over 55 peer review journal articles and 20 book chapters in the areas of quantitative research methodology, gifted education, and educational research. She has also authored, co-authored, or helped to develop dozens of affective instruments, including the *School Attitude Assessment Survey-Revised* (SAAS-R) and the *Challenges to Scholastic Achievement Scale* (CSAS). Dr. McCoach was the Founding Co-editor of the *Journal of Advanced Academics*, and she is the current Co-editor of *Gifted Child Quarterly*. She is an Associate Editor of *Frontiers in Quantitative Psychology and Measurement*. She currently serves on the review board for the *Review of Educational Research* (RER), and she has also served on the editorial review boards for the *American Educational Research Journal* (AERJ), the *Journal of Educational Psychology* (JEP), the *Journal of Educational Research* (JER), and the *Journal for Primary Prevention* (JPP).

Robert K. Gable, Ed.D., M.A., B.A., State University of New York at Albany, 1970/1967/1966. Gable is the Director of the Center of Research and Evaluation in the Graduate School and Former Director of the Educational Leadership Doctoral Program at Johnson & Wales University in Providence RI. He is an Emeritus Professor of Educational Psychology in the Neag School of Education at the University of Connecticut, where he taught courses in research methodology, statistics, survey development, and program evaluation from 1970 to 2000. He is a Former Director of the Bureau of Educational Research and Service at the University of Connecticut, and served as Director of research for the Leadership Research Institute consulting firm. Gable has published numerous texts, journal articles, tests, and research reports. He is the co-author of the *Postpartum Depression Screening Scale* (Beck and Gable), the *School Situation Survey* (Helms and Gable), and the *My Class Activities* survey (Gentry and Gable). He has received the Outstanding Leadership and Service award from the Northeastern Educational Research Association, an Excellence in Teaching award from the University of Connecticut Alumni Association, co-authored the 1999 “Manuscript of the Year” (Rong and Gable) in *The Journal of College and University Student Housing*, co-authored the “Best Original Research of 2012 in the *Journal of Midwifery & Women’s Health*, and received “Distinguished Paper” awards in 1995 and 2011 from the Northeastern Educational Research Association.

John P. Madura began his academic career with a B.A. in Mathematics (Logic and Computability) from Boston University and completed a M.A. in History and Education from Teachers College, Columbia University in 2000. After serving in the United States Navy as a Cryptologic Officer for 5 years, John taught secondary mathematics for 4 years in Connecticut and became interested in assessment and educational measurement, particularly in the affective domain. In 2010, he entered the Measurement, Evaluation, and Assessment doctoral program at the Neag School of Education at the University of Connecticut. At the University of Connecticut, he has worked to develop affective instruments in the fields of teacher evaluation, school science achievement, and public health. His substantive research interests center on aspects of interpersonal perception that occur in school settings and impact both school achievement and teacher evaluation. His methodological research focuses broadly on connections between theory development and statistical model specification. As a result, his work focuses on factor analysis, structural equation modeling (SEM), multilevel modeling (MLM), latent growth curve modeling (LGM), model fit, model invariance theories, and mediation and moderation effects.