Understanding and Applying Research Design

MARTIN LEE ABBOTT

JENNIFER McKINNEY

WILEY

ftp://
SITE AVAILABLE

UNDERSTANDING AND APPLYING RESEARCH DESIGN

UNDERSTANDING AND APPLYING RESEARCH DESIGN

Martin Lee Abbott
Jennifer McKinney
Seattle Pacific University

WILEY

A JOHN WILEY & SONS, INC., PUBLICATION

Cover Image: Courtesy of Dominic Williamson

Published by John Wiley & Sons, Inc., Hoboken, New Jersey.
Published simultaneously in Canada.

Library of Congress Cataloging-in-Publication Data:

Abbott, Martin, 1949-
Understanding and applying research design / Martin Lee Abbott, Jennifer McKinney.
p. cm.
Includes bibliographical references.
ISBN 978-1-118-09648-2 (cloth)
1. Research–Methodology. 2. Research–Statistical methods. I. McKinney, Jennifer, 1969- II. Title.
Q180.55.M4A236 2013
001.4'2–dc23

2012010997

Printed in the United States of America.

10 9 8 7 6 5 4 3 2 1

To
Joyce and William McKinney
Hannah Mary and Jacob Hovan

CONTENTS

Preface xvii

Acknowledgments xix

PART I WHEEL OF SCIENCE: PREMISES OF RESEARCH 1

1 **"DUH" SCIENCE VERSUS "HUH" SCIENCE** 3
How Do We Know What We Know? 3
Common Sense versus Science 6
"Duh" Science 6
"Huh Science" 8
How Does Social Science Research Actually Work? 10
What Are the Basic Assumptions of Science? 12
Common Sense Is Not Enough: Errors in How We Observe 12
Exercise: Should Marijuana Be Made Legal? 15

2 **THEORIES AND HYPOTHESES** 21
What are Theories? 22
What are Hypotheses? 25
Operationalizing Variables 28
Exercise: Operationalizing Concepts 29
Independent and Dependent Variables 34

3 **OBSERVATION AND EMPIRICAL GENERALIZATION** 35
Quantitative Designs 36
Surveys 36
Aggregate Data 38

Exercise: Using the Religious Congregations and Membership Study 39
Experiments 39
Qualitative Designs 41
Field Research 42
Content Analysis 44
Reliability and Validity 45
Empirical Generalizations 47
Correlational versus Causal Relationships 48
Types of Research 49
Pure Research 49
Applied Research 50
Evaluation Research 50
Action Research 51

4 **ETHICS** **52**
Human Subjects Abuses 55
Protection of Humans in Research 56
Professional Ethical Standards 61

PART II WHEEL OF SCIENCE: PROCEDURES OF RESEARCH **63**

5 **MEASUREMENT** **65**
Variables and Constants 65
Operationalization 66
Variation 68
Constants 73
Levels of Measurement 74
Exercise: Levels of Measurement 79
Units of Analysis 79
Exercise: Units of Analysis 80
Reliability and Validity of Measures 80

6 **USING SPSS IN RESEARCH** **83**
Real-World Data 83
Coverage of Statistical Procedures 84
SPSS Basics 84
General Features 85
Using SPSS with General Social Survey Data 87

7 **CHI-SQUARE AND CONTINGENCY TABLE ANALYSIS** **90**
Contingency Tables 90
Work Autonomy and Personal Health: An Example of a Contingency Table 91
Using Chi Square to Determine the Significance of Research Findings 93
Using SPSS for the Chi-Square Test of Independence 94
The Crosstabs Procedure 95
Effect Size: Contingency Coefficient 97
Effect Size: Phi Coefficient 98
Effect Size: Cramer's V 98
Creating and Analyzing the Contingency Table Data Directly 99
Concluding Comments 101

8 **LEARNING FROM POPULATIONS: CENSUSES AND SAMPLES** **102**
Censuses 103
Samples 103
Probability Sampling 105
Types of Probability Samples 106
Simple Random Sample 106
Systematic Random Sampling 108
Telephone Polls (Random-Digit Dialing) 110
Stratified Random Samples 112
Cluster Sampling 114
Probability Proportional to Size 114
Sampling and Statistics 115
Potential Biases in Probability Samples 119
Nonresponse 119
Selective Availability 119
Areal Bias 120
Nonprobability "Samples" 121
Convenience Samples 122
Quota Sampling 123
Snowball Sampling 124
Exercise: Populations and Sampling 125

9 **CORRELATION** **127**
The Nature of Correlation: Explore and Predict 128
Different Measurement Values 128

Correlation Measures 128
Interpreting the Pearson's Correlation 129
An Example of Correlation 129
Assumptions for Correlation 130
Plotting the Correlation: The Scattergram 130
Patterns of Correlations 132
Strength of Correlations in Scattergrams 132
Creating the Scattergram with SPSS 134
Evaluating Pearson's *r* 135
Correlation Using SPSS 136
Interpreting *r*: Effect Size 136
Correlation Influences 139
Correlation is Not Causation 141
An Example of Correlation Using SPSS 141
Example Worksheet: Correlation 142
Nonparametric Correlation 145

10 **REGRESSION** **146**
Understanding Regression through Correlation 147
Regression Models 147
Using SPSS to Understand Regression 149
Specifying the Analyses in SPSS 151
The SPSS Output 154
Interpreting Multiple Regression: The Combined, Omnibus Findings 155
Interpreting Multiple Regression: The Individual Predictor Findings 157
Using MLR to Establish Causality 159
Using MLR with Categorical Data 160

11 **CAUSATION** **162**
Criteria for Causation 163
Time 163
Correlation 163
Multiple Causes of Income 165
Nonspuriousness 166
Antecedent Variables 168
Using Control Variables to Detect Spuriousness 172
Intervening Variables 174
The Effect of Income on Politics 178

Income and Voting Example 182
Regression Analysis and Testing for Spuriousness 185
Detecting Spuriousness 190
Regression Example 193
Exercise: Testing Spuriousness in Crosstabs 196
Exercise: Testing for Spuriousness in Regression 200

PART III WHEEL OF SCIENCE: DESIGNS OF RESEARCH 203

12 **SURVEY RESEARCH 205**
Nature of The Survey 206
Three Types of Surveys 206
Face-to-Face Interviews 206
Telephone Interviews 209
Questionnaires 210
Online Survey Methods 210
Online Surveys 211
Online Forums 212
Survey Item Construction 212
Evaluating Closed-Ended Questions 215
Biased Language 217
Anchors 218
Balanced Categories 219
Double-Barreled Questions 219
Variation in Survey Analyses 221
Socially Acceptable Answers 222
Reliability and Validity 223
Respondent Knowledge 223
Respondent Refusal 224
Nonresponse in Questionnaire Data 224
Bias in Surveys 226
Studying Change with Surveys 227
Using Time in Survey Studies 228
Cohort Studies 228
Trend Studies 228
Panel Studies 229
Longitudinal Studies 229
Censuses and Sampling 230
Exercise: Survey Research in Action 230

13 **AGGREGATE RESEARCH** **234**
Nature of Aggregate Data 236
Areal and Social Units 236
Rates 238
Outliers 243
Exercise: Putting It Together 244
Exercise: Exploring Congregations in America 246

14 **EXPERIMENTS** **251**
Experimental Designs 253
Pre-Experimental Designs 253
Design 1: The One-Shot Case Study 254
Design 2: One Group Pretest-Posttest Design 254
Design 3: The Static Group 256
Selection Bias 257
True Experimental Designs 257
Design 4: The Classic Experiment 257
Design 5: Solomon Four-Group Design 257
Quasi-Experimental Designs 258
Design 6: Pre-Post Nonequivalent Control Group Design 258
Fidelity of Experimental Design 259
Experimental Settings 260
Laboratory Experiments 260
Field Experiments 261
Natural/Disaster Experiments 262
Survey Experiments 263
Ethics 265
Reliability and Validity 265
Exercise: Experiments in Action 266

15 **STATISTICAL METHODS OF DIFFERENCE: *T* TEST** **270**
Independent and Dependent Samples 271
Independent *t* Test 271
Example of Experiment 272
Post Facto Designs 273
Independent *t* Test: The Procedure 274
Independent *t* Test Example 275
The Variables Used in the Example 276

The SPSS Results 276
Effect Size for the Example 278
Additional *t* Test Considerations 279

16 **ANALYSIS OF VARIANCE** **280**
The Nature of the ANOVA Design 281
The Components of Variance 282
The Process of ANOVA 283
Calculating ANOVA 284
Effect Size 286
Post Hoc Analyses 288
Assumptions of ANOVA 288
Additional Considerations with ANOVA 289
A Real-World Example of ANOVA 289
Using SPSS for ANOVA Procedures 290
1. Do the Different Independent Variable Groups Show Normally Distributed Dependent Variable Distributions? 291
2. Are Variances Equal? 294
3. Are Samples Independently Chosen? 294
4. Are Interval Data on the Dependent Variable? 294
SPSS Procedures with One-Way ANOVA 294
SPSS ANOVA Results for the Example Study 298
The ANOVA Table 298
Effect Size 299
The Post Hoc Analyses 299

17 **FIELD RESEARCH** **301**
Selecting a Topic 302
Relevance 303
Accessibility 303
Censorship 305
Independent Funding 305
Risk 306
Entering the Field 307
Neutralizing Observer Effects 309
Taking Data in the Field 309
Interviewing in the Field 309
Field Notes 310
Reliability and Validity 310

Ethics 312
Exercise: Field Research in Action 315

18 **CONTENT ANALYSIS** **316**
Defining the Population 317
Census or Sample? 318
Coding in Content Analysis 319
Coding *Rolling Stone* 321
Reliability and Validity 322
Exercise: Content Analysis of Popular Magazines 324

PART IV STATISTICS AND DATA MANAGEMENT **327**

STATISTICAL PROCEDURES UNIT A: WRITING THE STATISTICAL RESEARCH SUMMARY **329**

STATISTICAL PROCEDURES UNIT B: THE NATURE OF INFERENTIAL STATISTICS **333**
Probability 337
Probability, the Normal Curve, and *p* Values 338
Populations (Parameters) and Samples (Statistics) 339
The Hypothesis Test 340
Statistical Significance 341
Practical Significance: Effect Size 341

DATA MANAGEMENT UNIT A: USE AND FUNCTIONS OF SPSS **343**
Management Functions 343
Reading and Importing Data 343
Sort 344
Additional Management Functions 349
Split File 349
Compute (Creating Indices) 354
Analysis Functions 354
Data Management Unit A: Uses and Functions 356

DATA MANAGEMENT UNIT B: USING SPSS TO RECODE FOR *T* TEST **357**
Using SPSS to Recode Questionnaire Items 357
Recoding “health1” 357
Recoding “fairearn” 361
Data Management Unit B: Uses and Functions 363

DATA MANAGEMENT UNIT C: DESCRIPTIVE STATISTICS 364
Descriptive and Inferential Statistics 364
Descriptive Statistics 365
Descriptive Procedures for *Nominal* and *Ordinal* Data 365
Using SPSS Graphs for Nominal and Ordinal Data 368
Using SPSS Frequencies Command for Nominal- and Ordinal-Level Data 368
Descriptive Procedures for Interval Data 374
Numerical Procedures: Central Tendency 374
Numerical Procedures: "Balance" and Variability 379
Obtaining Descriptive (Numerical) Statistics from SPSS 382
Using SPSS Explore 384
Obtaining Descriptive (Visual) Statistics from SPSS 388
Data Management Unit C: Uses and Functions 388

STATISTICAL PROCEDURES UNIT C: *z* SCORES 389
The Nature of the Normal Curve 389
The Standard Normal Score: *z* Score 391
Calculating *z* Scores 391
Using SPSS to Create *z* Scores 394
Statistical Procedures Unit C: Uses and Functions 396

Glossary 397

Bibliography 411

Index 416

PREFACE

Social scientific research is the systematic and rigorous process of exploring the world around us. Good social science requires good research design and solid analytic skills. Both authors strive to teach students the methods of research design and statistical analysis in order that students learn how to pose research questions, test research questions, and draw conclusions on the research that they have conducted, as well as to critique the research they are exposed to through media, classes, and real-life situations. We have taught research methods and statistics courses at the university level for many years. In addition, we have published articles and books on the subjects and are involved in applied research projects in which we put into practice what we develop in this book.

This book grew from the need to provide a systematic but approachable book for our students. Other research design books often use a stilted approach that masks the vibrancy of research statistics and design (or they focus simply on either statistics *or* design). In this book, we hope to avoid these issues by providing a creative format and common language that will enable students to understand the content of social research at a more meaningful level.

The layout of the book is a reflection of our approach to teaching, and it targets contemporary student learning styles. We present research design material in approachable language interspersed by content that allows students the opportunity to delve as deeply as they wish in the material. Extended study units in statistical concepts and application exercises are placed strategically throughout the book to enhance the main focus of the book, research design.

We use SPSS®[1] screen shots of menus and tables by permission from the IBM® Company. IBM, the IBM logo, ibm.com, and SPSS are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "IBM Copyright and trademark information" at www.ibm.com/legal/copytrade.shtml. We include SPSS screen shots in the following chapters and sections: Chapters 1–3, 6–11, 13, 15, and 16, Statistical Procedures Unit C, and Data Management Units A–C.

[1] SPSS, Inc., an IBM Company. SPSS screen reprints throughout the book are used courtesy of International Business Machines Corporation, © SPSS, Inc., an IBM Company. SPSS was acquired by IBM in October 2009.

In preparing this book, we have distilled the most meaningful content from our class-tested approaches and from our published works. We use current real-world data for our examples and discussions, in particular, the 2010 GSS[2] database, a large state (Washington) database[3] that compiles school-based data on student achievement, and publicly accessible data from the U.S. Census 2010.[4] Much of the content on statistical procedures and using SPSS is adapted from Abbott's previous work.[5] We hope readers enjoy learning about the engaging world of research premises, procedures, and designs.

Martin Lee Abbott
Jennifer McKinney

[2] The GSS data are used by permission. Smith, Tom W, Peter Marsden, Michael Hout, and Jibum Kim. *General social surveys, 1972–2010* [machine-readable data file] /Principal Investigator, Tom W. Smith; Co-Principal Investigator, Peter V. Marsden; Co-Principal Investigator, Michael Hout; Sponsored by National Science Foundation. NORC ed. Chicago: National Opinion Research Center [producer]; Storrs, CT: The Roper Center for Public Opinion Research, University of Connecticut [distributor], 2011. (http://www3.norc.org/GSS+Website/)

[3] The data are used courtesy of the Office of the Superintendent of Public Instruction, Olympia, Washington. The Web site address is http://www.k12.wa.us/.

[4] U.S. Census, 2010.

[5] Abbott, Martin Lee, *Understanding Educational Statistics using Microsoft Excel® and SPSS®*, Wiley, 2011. Also, Abbott, Martin Lee, *The Program Evaluation Prism*, Wiley, 2010. Both are used by permission of the publisher.

Supplementary material for this book can be found by entering ISBN 9781118096482 at booksupport.wiley.com.

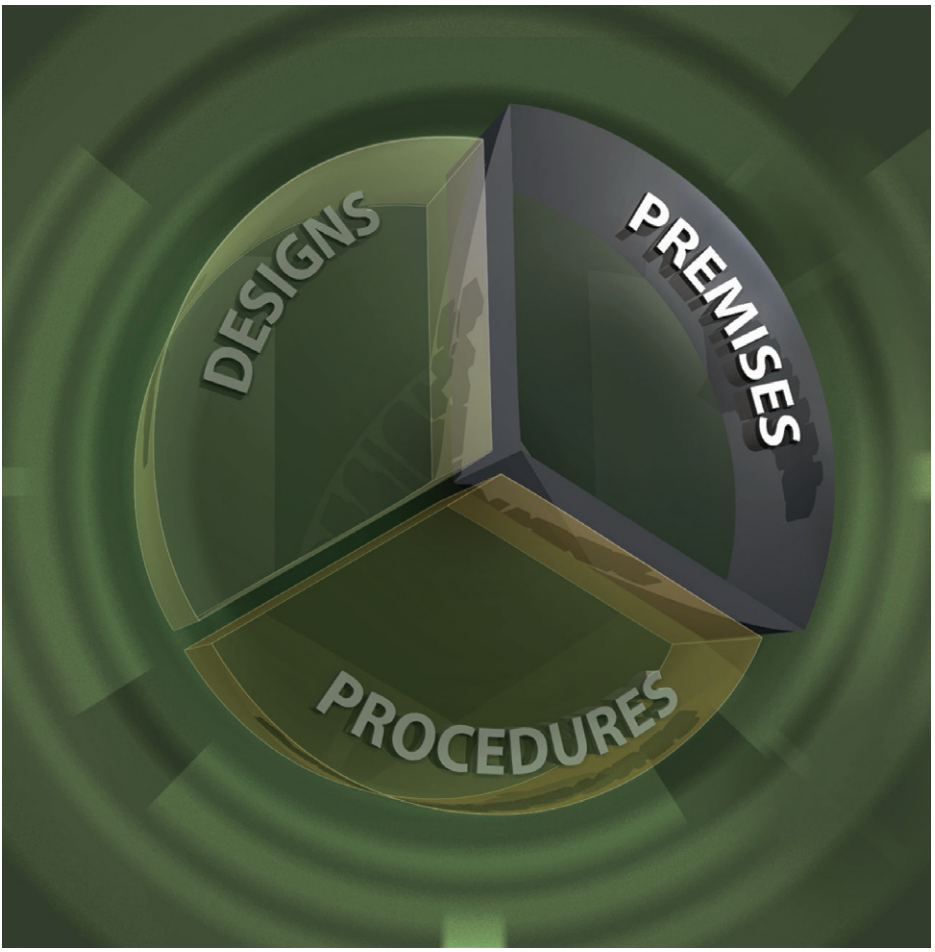
ACKNOWLEDGMENTS

Several people have helped to make this book possible. We would like to thank our friends and colleagues David Diekema, Sara Koenig, Paula Mitchell, Greg Moon, Kevin Neuhouser, Lorraine Shaman, Karen Snedker, Cathy Thwing, Linda Wagner, and Cara Wall-Scheffler. We thank Dominic Williamson for his graphic design that we use in the book (and on the cover) and Roger Finke for allowing us to draw so much from the ARDA. We also thank Jacqueline Palmieri for her continuing support of our efforts to publish accessible social science matter.

Finally, we thank our students who have taught us how to think about teaching statistics and design, and who help us to remember that research methods are fun!

M.L.A.
J.M.

PART I
WHEEL OF SCIENCE: PREMISES OF RESEARCH



1

"DUH" SCIENCE VERSUS "HUH" SCIENCE

HOW DO WE KNOW WHAT WE KNOW?

When we go through the education process, we each take several categories of classes, especially if we know we're headed to college. Often one of these categories is "science" and includes classes in biology, chemistry, or physics. Because of this we come to think of science as particular substantive areas rather than as a particular *process*. The process of science allows us to follow systematic steps to better understand the world around us. Whether using amino acids, elements along the periodic chart, sound waves, or people's attitudes, following the process of science allows us to see patterns in our materials. Granted, it's often harder to think of people as "materials" than it is to think of saltwater solutions as materials. Regardless of what we are looking for, following the scientific process allows us to gauge what is going on in the world.

The process of social science differs from other sciences only in that the social sciences use people to find patterns. While most of us think of people as individuals, each individual lives in a particular social context that has a surprising amount of order to it. For example, Americans drive on the right side of the road; Britons drive on the

Understanding and Applying Research Design, First Edition. Martin Lee Abbott and Jennifer McKinney.

left. Even though both countries are made up of individuals, they each tend to transfer their cultural order to walking on the same side of the sidewalk. Even though each individual may walk in a unique way (perhaps like Monty Python's "lumberjack walk"), each tends to gravitate toward the right or left side of a sidewalk depending on country—or cultural order—of origin.

Keeping with a roadway example, have you ever thought about the only thing keeping one vehicle from hitting another in a head-on collision is a measly 6 inches of yellow paint? Think about the 6 inches of white paint that keeps cars traveling in your direction from driving into you. If you consider a large urban area with millions of people trying to travel by car into and out of the area every day, isn't it amazing how few car accidents there are? In Seattle (even with our perpetually wet weather), there are roughly four million people trying to get into and out of the metropolitan area each weekday. But there are less than a hundred vehicular accidents in a given 24-hour period, illustrating just how effective 6 inches of paint can be in regulating the behavior of millions of people. That people and social patterns have such a high degree of order allows us to study just where these patterns originate and predict when they are going to show up.

Knowing there are social rules and boundaries in place that create a high degree of social order, the task for the social scientist is to measure people's attitudes, behaviors, and experiences to find common patterns. The question becomes, however, why should you need social science when you live in the same world or social context and experience these things for yourself? Why rely on social science to generalize to a population or group of people or things? How do you know what social science says is true? How do you know what is good information? The only way to truly know about the social patterns around us is to understand the process of science.

Say, for example, your professor distributes a class exercise asking you to evaluate some research finding. You are first asked if the finding is surprising or not, and then you are asked to write down a reason or two why you believe that finding is or is not true. Let's say that you are given the finding, "Social scientists have found that opposites attract." Is this finding surprising? How do you evaluate this statement? What evidence do you have that opposites attract? Go ahead and think of or jot down why you believe that opposites attract.

What if your professor is being a bit cagey and secretly handed out two contradictory research findings? Whereas you received "opposites attract," the other half of the class received the reverse finding that "Birds of a feather flock together." As the class comes together to discuss the research finding, an interesting thing will happen. When asked how many in the class found "this" finding to be not surprising, most of the class will raise their hands to show how unsurprised they were. That a majority of the class reports their research result is true and not surprising is interesting considering the class had two very different findings. This predicament illustrates the **hindsight bias**. In hindsight, research results seem like common sense; we take for granted that research findings must be true—after they are given.

As you thought about the finding you were given, you probably searched your experience for one case (person) where "opposites attract" was true. Generally when

we hear about research findings after the fact, we think of at least one case of **confirming evidence**. This means we look to our own experience and try to find one person or situation that fits the finding given. In this case, you probably thought of at least one friend or acquaintance who was in a relationship where opposites attract. Your classmates with the contradictory finding were doing the same thing, trying to find an example of someone they knew in a relationship where birds of a feather flock together. But trying to explain research findings using our own experiences and already being biased by what the result appears to be hurts our ability to see the world as a whole. If you thought of one person who served as an example of each finding, that's two people. Can two (or even 10 people you may have thought of) represent the whole social spectrum? Even in just an American context, there are well over 310 million people to consider. Do we really want to base our understanding of which adage is more true simply by finding two examples that *confirm* the finding and *conform* to our limited experience? It's highly unlikely that diametrically opposed research findings like opposites attract or birds of a feather flock together happen exactly randomly and at the same rate in a given social context. So how do we know which is more descriptive of everyday attraction?

Social scientists recognize that, while everyone's personal experience of the world is unique, there are social patterns that transcend our own experiences. Social scientists look for both the confirming evidence and the disconfirming evidence—examples where a finding would not be true—to give us direction as to how to generalize to the whole population which would be true. Can we find instances where B does not follow A? If so, that leads us into asking new questions and testing data to give us a more comprehensive picture and stop us from making a hasty conclusion based on very little evidence.

Every day we evaluate information based on our own experience. This is usually helpful for us. What if you and your friends are trying to decide which movie to see on a weekend? Do you choose whichever blockbuster is showing? Do you go to the film that may not be in the theater next week? Do you choose a movie based on what genre you tend to prefer? Do you pick a movie based on a friend's recommendation? Do you choose the film based on the critical reviews? Do you choose a film based on your schedule—whichever is showing at the closest theater at a particular time? You probably use a combination of these methods to figure out which is the best movie to see at any given time. Have you found that even when using your own judgment (based on your preferences and friends' reviews) that the movie was a dud? In effect, social scientists are trying to tease out all of the ways we can think about a particular topic. That helps us to test topics to try to find consistent answers to research questions.

Science is needed because we do not experience the world randomly. How we experience and view the world is highly influenced by our **social location**—where we fit into the social order (our social class perspective, our gender perspective, our educational perspective, our political perspective, our religious perspective, etc.). Two people viewing the exact same event could interpret it very differently, depending on their personal context (or biases). For example, bringing a homeless encampment to

a local college campus could elicit a hearty "well done" from students and faculty who want to address the issues of homelessness and poverty. At the same time, parents and local residents may protest bringing a group of homeless people to stay on campus as dangerous—for their personal safety and the safety of their property. The same event is viewed very differently by people living within the same neighborhood because they have different social locations (students, faculty, parents, and homeowners have different interests and expectations of events). Wouldn't it be helpful to have some social science research that can explain and predict what really happens when a homeless encampment is brought to campus, as well as why people from different social locations respond differently to the same event?

Common Sense versus Science

Because we view the world from particular social locations, or biases, we need science to provide a baseline; what effects does one thing have on another, regardless of your perspective? Like trying to explain why opposites attract or birds of a feather flock together, social scientists are often accused of pointing out what is only common sense or what everyone already knows to be true. Of course, the hindsight bias hurts our ability to think novelly or clearly about particular relationships or facts, and it leads many to conclude that social science is just "duh" science—senseless science that points out the obvious.

"DUH" SCIENCE

Eryn Brown (2011) from the *Los Angeles Times* writes about this seemingly pointless research, enumerating studies that seem silly at best, wasteful at worst. For example, she writes of studies confirming that nose-picking is common among teens, or that college drinking is as bad as researchers believe, or that making exercise more fun may improve the fitness of teens, or that driving ability is compromised with people who have Alzheimer's disease. "Well, duh, you might think—and you wouldn't be the first," she writes. The perception that social science simply tests the obvious is widespread, and yet there is more to "duh" science than meets the eye.

Many studies have to test the so-called obvious because until there are widely established links between behaviors or attitudes and some effect, we simply cannot be sure that real links between them exist. Even when clear and reliable links are found, it may take oodles of evidence to convince others that the links are real—often because people don't understand the nature of science or they dismiss commonsense findings as "duh" science. Look at how many studies had to be done linking smoking to various cancers and lung disease before people began to believe these results were real (Brown 2011). Because of research we now understand the link between smoking and cancer, but we didn't at first (and of course, with hindsight bias it seems silly to think there isn't a link between smoking and a variety of cancers).

An Example of "Duh" Science: The 2011 Ig Nobel Prize Winners[1]

Chemistry Prize: For determining the ideal density of airborne wasabi (pungent horseradish) to awaken sleeping people in case of a fire or other emergency, and for applying this knowledge to invent the wasabi alarm. Makoto Imai, Naoki Urushihata, Hideki Tanemura, Yukinobu Tajima, Hideaki Goto, Koichiro Mizoguchi, and Junichi Murakami of Japan.

Reference: U.S. patent application 2010/0308995 A1. Filing date: February 5, 2009.

Medicine Prize: For demonstrating that people make better decisions about some kinds of things but worse decisions about other kinds of things when they have a strong urge to urinate. Mirjam Tuk, Debra Trampe, and Luk Warlop and jointly to Matthew Lewis, Peter Snyder, and Robert Feldman, Robert Pietrzak, David Darby, and Paul Maruff.

Reference: Tuk MA, Trampe D, Warlop L. Inhibitory spillover: increased urination urgency facilitates impulse control in unrelated domains. Psychol Sci 2011; 22(5):627–633; Lewis MS, Snyder PJ, Pietrrzak RH, et al. The effect of acute increase in urge to void on cognitive function in healthy adults. Neurol Urodyn 2011;30(1):183–187.

Psychology Prize: For trying to understand why, in everyday life, people sigh. Karl Halvor Teigen.

Reference: Teigen KH. "Is a sigh 'just a sigh'? Sighs as emotional signals and responses to a difficult task." Scand J Psychol 2008;49(1):49–57.

Literature Prize: John Perry of Stanford University, USA, for his Theory of Structured Procrastination, which says, "To be a high achiever, always work on something important, using it as a way to avoid doing something that's even more important."

Reference: Perry J. How to procrastinate and still get things done. Chronicle of Higher Education, February 23, 1996. Later republished elsewhere under the title "Structured Procrastination."

Biology Prize: For discovering that a certain kind of beetle mates with a certain kind of Australian beer bottle. Darryl Gwynne and David Rentz.

Reference: Gwynne DT, Renta DCF. Beetles on the bottle: Male buprestids mistake stubbies for females (Coleoptera). J Aust Entomol Soc 1983;22(1):79–80; Gwynne DT, Renta DCF. Beetles on the bottle. Antenna: Proc (A) Royal Entomol Soc London 1984;8(3):116–117.

(*Continued*)

[1] The Ig Nobel Prizes honor the unusual and imaginative research conducted in science, medicine, and technology (see Improbable Research 2012 at http://improbable.com/ig/).

Physics Prize: For determining why discus throwers become dizzy and why hammer throwers don't. Philippe Perrin, Cyril Perrot, Dominique Deviterne, Bruno Ragaru, and Herman Kingma.

Reference: Perin P, Perrot C, Deviterne D, et al. Dizziness in discus throwers is related to motion sickness generated while spinning. Acta Oto-Laryngol 2000;120(3):390–395.

Mathematics Prize: Dorothy Martin (who predicted the world would end in 1954), Pat Robertson (who predicted the world would end in 1982), Elizabeth Clare Prophet (who predicted the world would end in 1990), Lee Jang Rim (who predicted the world would end in 1992), Credonia Mwerinde (who predicted the world would end in 1999), and Harold Camping (who predicted the world would end on September 6, 1994, and later predicted that the world will end on October 21, 2011), for teaching the world to be careful when making mathematical assumptions and calculations.

Peace Prize: Arturas Zuokas, the mayor of Vilnius, Lithuania, for demonstrating that the problem of illegally parked luxury cars can be solved by running them over with an armored tank.

Reference: VIDEO and OFFICIAL CITY INFO.

Public Safety Prize: John Senders for conducting a series of safety experiments in which a person drives an automobile on a major highway while a visor repeatedly flaps down over his face, blinding him.

Reference: Senders JW, et al. The attentional demand of automobile driving. Highway Research Record 1967;195:15–33. VIDEO.

"HUH SCIENCE"

While it is easy to dismiss scientific findings that seem obvious, keep in mind that our biases impact how we view what is obvious and what is not. Not only do social scientists try to find a baseline of behavior that may seem obvious (regular exercise leads to longevity), they are also able to illustrate the not so obvious. In the United States, for example, most people understand that religion has been in consistent decline since the birth of the nation when all of the Pilgrims walked to church every Sunday in the deep snow, uphill both ways. We all know this is true—common sense informs us that the United States was a devoutly religious culture and is now a highly secular culture. That religion has been in consistent decline is anachronistic—obvious. Yet participation in American religion can be measured. When looking across time, actually counting religious participation, Finke and Stark (2005) found that religious participation had only increased in America until the 1960s when the total percentage of the population