Book Review: An Introduction to Scientific Research Methods in Geography and Environmental Studies by Daniel R. Montello and Paul Sutton, Second Edition

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This updated and extended Second Edition of ***An Introduction to Scientific Research Methods in Geography and Environmental Studies*** *aims to provide a broad and integrative introduction to the conduct and interpretation of scientific research in geography. This new edition includes new material on GPS and map projections, as well as an expanded chapter on scientific communication. Reviewed by* ***Yves Laberge.***

An Introduction to Scientific Research Methods in Geography and Environmental Studies. 2nd Edition. Daniel R. Montello and Paul Sutton. SAGE. 2013.

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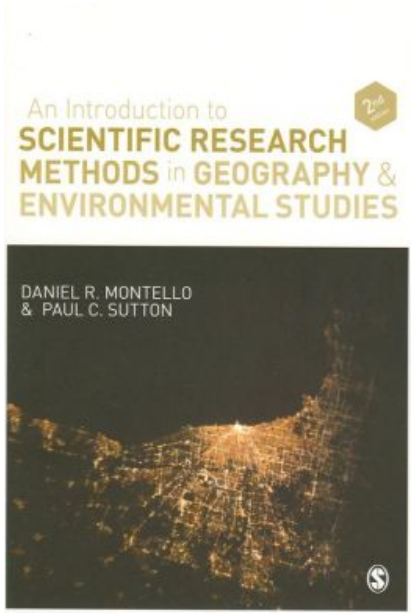

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This *Introduction* – aimed at undergraduate students conducting research in geography and environment studies – first appeared in 2006 and has now been updated and reorganised to include extra examples, new exercises, and fresh perspectives on conducting research. Geography students and the work they do – as Michael Palin has acknowledged – hold the key to solving some of the world's biggest problems, and in this book we find a solid base from which the next generation of students can start their research and continue to make a difference to such things as climate change campaigns and new energy options.

Like any methodology book, Montello and Sutton's *Introduction* covers the usual steps in academic research: first, a presentation of fundamental research concepts (chapter 2); then the tacit rules of scientific communication in the field, covering peer-reviewed journals (chapter 3); followed by the main processes of data collection and coding (chapter 4); physical measurement processes (chapter 5); and the use of behavioral observations and archives, and how to locate them (chapter 6). Later chapters cover surveys, interviews and tests (chapter 7); the distinctions between experimental and non-experimental research design (chapter 8); the more technical processes such as sampling (chapter 9); statistical data analysis (chapter 10); and finally, how to display or visualise your results into graphs or tables (chapter 11).

What makes this book stand out from other methodology books, however, is its clarity on definitions, approaches, and the place of smaller sub-fields of geography in the wider discipline. This aim for precision in definitions is especially useful for new students, with the authors offering definitions of complex key terms in just a few short, quotable phrases; for example, "volunteer bias" is defined by the authors as "the degree to which a sample is not representative of a sampling frame because potential cases who volunteer to participate in the study are different than those who do not" (p. 185).

An openness towards interdisciplinarity and multidisciplinarity appears in many chapters, and the book is strong in its linking of the physical sciences and physical geography to the human and social sciences; not an easy task, especially in a methodology text. As a consequence, readers are introduced to a variety of concepts related to unusual dimensions of the subject, like functional magnetic resonance imaging (FMRI), Earth systems, cartography, and geodesy (see Chapter 5 and p. 86).

Perhaps this book's most distinctive contribution is Chapter 12, "Reliability and Validity", as it poses an essential question fo young researchers: "when do we stop our research?" Of course, this question is frequently asked in methodology books, bu the authors succeed in addressing what many young researchers consider a difficult issue. In order to draw the line, Montello and Sutton focus on these two methodological notions: reliability and validity. Reliability is reached whenever the same operations give the same results within a controlled experience, under the same conditions; it is "the 'repeatability' of measured values of variables" that matters (p. 258). Likewise, validity is presented as the basic, essential goal for any researcher; in other words "the 'truth-value' of research results and interpretation" (p. 258).

The authors go on to provide a few tips on understanding when research goals have been achieved, insisting on the importance of "internal validity", which "concerns the truth of conclusions about causal relationships" in the actual research process (p. 250). Moreover, Montello and Sutton remind us that any measurement system has its own inner limitations: "Th idea of construct reality reflects the recognition that the scores in our data sets are *attempts* to assess the values that cases actually possess on our constructs of interest, attempts that are nearly always a little mistaken, maybe very mistaken" (p. 250).

Geography students on a field trip. Credit: Cortes de Cima CC BY-NC-SA 2.0

In their concluding remarks, the authors suggest that project leads do not inform research assistants of specific goals so that they cannot set out to obtain the desired conclusions: "Sometimes it is appropriate to keep assistants 'blind' to the specific hypothesis of the research or the specific condition to which a subject has been assigned" (p. 255). Although this uncommo attitude toward some selected members of the research team could seem ethically arguable (or even unacceptable), no other precaution is taken by the authors with these regards (p. 255). In my view, readers and young researchers within established groups who have any doubts should rather consult their immediate colleagues and supervisors in terms of transparency and disclosures, or even reconsider working with another new team if they seem to use or rely on unethical rules.

A quibble would be that the book is very much centred on the USA, and does not consider European examples, or those from any other region. Most examples refer to U.S. institutions and contexts, such as the American Community Survey (ACS) (p. 135), the U.S. Census Bureau (p. 138), and data only concerning US-levels of society (see an otherwise very

interesting thematic map about obesity in America on p. 234). Even the list of English-language academic journals in the discipline on page 41 includes no scholarly titles from their nearest neighbour Canada. Likewise, European societies are almost invisible on these pages. This odd lack of foreign presence is surprising and rather disappointing for a geography book, especially from a publisher such as SAGE which is based in four countries and three continents. In order to avoid misleading expectations, this limitation should appear in the title.

This quibble apart, this second edition of *An Introduction to Scientific Research Methods in Geography and Environmental Studies* now ranks itself in the category of "books with experience", that is, it can be situated among these few noted books that have probably been used in many classes through the years. While advanced undergraduates in geography and natura sciences would obviously benefit from this reading at the condition of being combined with other related titles, other student in the broader field of environmental studies might also learn from the authors' interdisciplinary approach.

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