Planning, Proposing, and Presenting Science Effectively

Second Edition

This concise guide to planning, writing, and presenting research, especially in biology and behavioral ecology, is intended for students at all levels. The guidelines apply equally to independent projects for introductory courses, directed-study projects, and undergraduate senior theses, as well as to master's theses, doctoral dissertations, and research aimed at publication.

We have updated several topics in this edition, most of which reflect technological advances that have changed the way science is proposed and presented and have opened up new ethical challenges.

New features of this edition include:

- Tips on the process of preparing grants and manuscripts for electronic submissions.
- Description of how to prepare effective presentations in PowerPoint®.
- Discussion of how to produce computer-generated posters.
- Extended comments on ethics, and a new appendix on ethical considerations.

This edition also continues to:

- Guide the reader through a discussion of the nature of scientific research, how to plan research, and how to obtain funding.
- Discuss writing a research proposal, whether for a formal proposal for thesis research to be written by a graduate student or for a research proposal for a funding agency such as the National Science Foundation (using the Doctoral Dissertation Improvement Grant format as a specific example).
- Deal with writing a research report such as a graduate thesis or a manuscript for publication in a research journal.

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Frontmatter
More information

- Give advice and guidelines for presenting the results of research at research seminars and scientific meetings, and also provide useful tips on preparing abstracts and posters for scientific meetings.
- Show how to write an effective c.v.
- Give tips on how to write clearly, common abbreviations (including Latin phrases), and difficult inflections, as well as other issues.

Throughout, the book is illuminated with personal examples from the authors' own experiences with research in behavioral ecology, and there is an emphasis on problems associated with field studies.

All biologists and many others will find this a valuable resource and guide for the early years of their scientific careers. Established faculty will find it an essential instructional tool.

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A Guide for Graduate Students and Researchers in the Behavioral Sciences and Biology

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Contents

Preface

Training in the biological sciences, and indeed in most sciences, appropriately emphasizes mastery of techniques and theory – essential elements of any original research endeavor. The less glamorous steps to successful research are often neglected in the formal training programs of scientists – such as how to plan a study adequately, secure research funds effectively, present results (written and oral) clearly and interestingly, and present qualifications in a résumé. This book is a map to those activities, with examples drawn primarily from the authors' discipline of behavioral ecology. In the first edition, we integrated our own experiences with the most frequent problems encountered by our students to produce what we hoped would be a helpful, concise guide to the more practical aspects of scientific research. In this second edition, we have updated these tips to accompany the changes that advances in computer technology and the Internet have brought to the practical sides of submitting research grants and manuscripts and presenting research in talks and posters. We have also deleted one of our original appendixes, which provided addresses for funding agencies, because these are now readily available on the Web, and have replaced it with an appendix on ethics considerations. The basics of planning scientific research remain the same, however.

Our concern is with widely applicable skills. If you want to know details – such as what research questions are currently considered ''hot'' in your field, what organizations are currently offering monies for what kinds of research, what laboratory and field techniques are state-of-the-art, or how to use modern computer-intensive statistical applications properly – you must seek specific sources appropriate to your needs. In this book, you will find

suggestions for how to develop your research plans and communicate the results of your research.

Any well-constructed book is aimed at a defined audience but is appropriate for others in proportion to their nearness to the target. The bull's-eye of our target is the master's or doctoral student in behavioral ecology, ethology, or comparative psychology. Going in one direction, senior thesis students and any undergraduate otherwise involved in research will find applicable material. In the other direction, postdoctoral researchers, untenured faculty, and even senior researchers should find useful information. In an entirely different dimension, related fields of study involving whole organisms – say, ecology, conservation biology, neuroethology, bioacoustics, and such – will be very near to the target. As one generalizes to other areas of biology and allied disciplines, the material will diminish somewhat in specific applicability but remain useful in generalities.

We realize that some researchers may seek different emphases: perhaps extensive treatment of how to turn the germ of an idea into a viable project, or many specific examples of funded research applications, or advanced training in how to "wow" an audience with an oral presentation. In our decisions concerning the balance and depth of topics covered, we recognized that no volume will fully satisfy everyone. There seems never to have been written a book that covers all the ground of this one, but there are several fine volumes that treat certain issues in greater detail than here. For this reason, and because we strived to keep this guide concise and handy, we have provided an annotated bibliography of works for reading and reference. If there is an appropriate work that escaped our list, the omission was unintentional.

ACKNOWLEDGMENTS

Every possible way of thanking others in a non-perfunctory manner seems already to have been used by some author somewhere. Our lack of originality therefore betrays no lack of appreciation in

acknowledging our students for their encouragement to produce this volume and their feedback on an earlier version, and our colleagues Robert L. Jeanne and Charles T. Snowdon for their extensive and thorough suggestions upon reading the entire manuscript of the first edition. We are also grateful to editor Robin Smith and our anonymous reviewers for their encouragement and helpful suggestions; to Fran Bartlett and Jeanne Borczuk of G & H Soho for the high quality of work and interactive spirit in copy editing, preparing proof, and indexing; and especially to Liz Hailman for all her help during the final months of producing the first edition. The second edition would not have emerged without the encouragement and support of senior editor Tracey Sanderson. This edition also incorporates the many suggestions Jeremy J. Hatch provided after the first edition was published, tips from Luisa Arnedo on generating posters using modern technology, and indirect input from other students and colleagues who have generously shared their experiences of planning, proposing, and presenting science.

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