Practical Advice on How to Run Human Behavioral Studies

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(I) Objectives and scope of the tutorial

The lack of materials on the details of running human experiments can lead to a gap between theory and practice, which is particularly acute in cognitive science done outside of psychology departments. Consequently, labs frequently must not only impart these practical skills to students informally but also must address misunderstandings arising from this divorce of theory and practice in their formal education. Researchers in psychology often end up appalled by the lack of this common but undocumented sense when behavioral research is reported by researchers outside of psychology. This tutorial provides practical advice on how to run studies for beginning students and researchers coming starting to run studies.

The details about how to run the studies themselves, how to interact with subjects and so on, are often learned solely through apprenticeship in a psychology or HCI lab. However, many researchers who are running or want to run studies do not have access to learning this tacit knowledge.

This half-day or full-day tutorial will provide participants with an overview of how to run studies with human participants, that is, not how to design or analyze studies but the practicalities of how to setup, debug, and run studies. It will help people running experiments to run them more effectively safely, and comfortably. Our purpose is to provide hands-on knowledge about experimental procedure.

The tutorial will cover the major topics noted in Figure 1. In particular, the tutorial will cover the role of identifying the research problem and reading in the general area; preparation for running a study, including piloting and IRB proposals; preparing to run a formal study, including advertising and recruiting subjects; running study sessions; and wrapping up a study.

(II) How the tutorial will be delivered

The tutorial will cover the topics in Figure 1 using a lecture/discussion format. The topics will be introduced using a presentation and discussion will follow each section using scenarios and questions included in the book and developed for the Cognitive Science Conference. An early draft (approximately half the current length) of the material is available at acs.ist.psu.edu/reports/ritterKM09.pdf, and published copies will be available in the future from Sage.

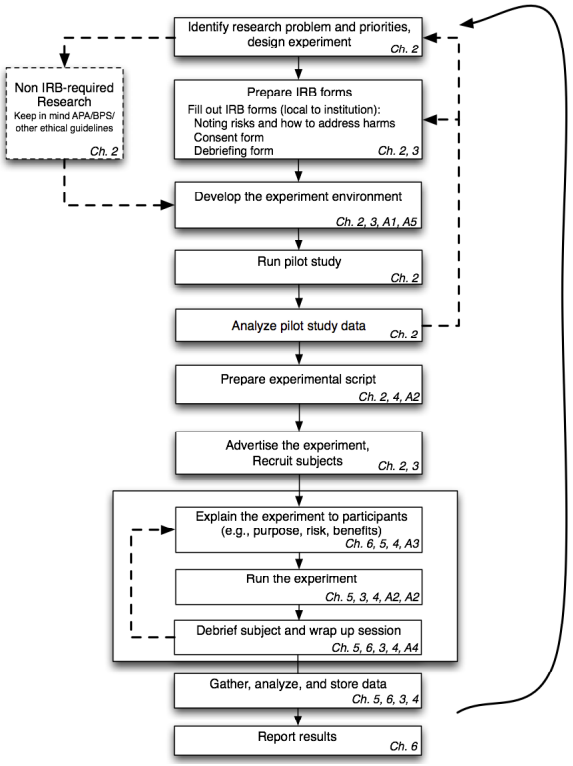

Figure 1. A pictorial summary of the research process with respect to running a human behavioral study. This is similar to, but developed separately from Bethel and Murphy's (2010) figure for human-robotic studies

A copy of the 121 page book as a printout will be provided (assuming that participant numbers can be specified well enough in advance or copied by the conference locally).

(III) Why the presenter and authors are well suited to give a tutorial in the proposed area

The presenter is well qualified to prepare and present a tutorial in this area. Along with colleagues, Ritter has recently written a book for Sage on this topic (Ritter, Kim, Morgan, & Carlson, in press).

Ritter has also run and directed studies with human participants (e.g., Klein, Bennett, Whetzel, Granger, & Ritter, 2010; Reder & Ritter, 1992; Ritter, Freed, & Haskett, 2005; St. Amant, Horton, & Ritter, 2004; Yeh, Gregory, & Ritter, 2010). His collaborators on this tutorial and book include an industrial engineer (Kim), a research assistant who helps run studies (Morgan), and a professor of psychology who has been a member of an IRB board and

director of a psychology department subject pool (Carlson). While these co-authors will not be presenting, they will help prepare the slides and are co-authors of the book that will be given to attendees.

Ritter is also familiar with tutorials in general because he served as the first co-chair of tutorials at the Cognitive Science Conference in 1999. Since then he has severed as tutorial chair or co-chair at the Cognitive Science Conference (2001, 2002, 2004, 2005), and at the International Conference on Cognitive Modeling (2004, 2006, 2007, 2009, 2010, 2012), and was the co-chair of the 2011 HCI Consortium Workshop, which was made up exclusively of tutorials on ways of knowing in HCI. In addition, he gave a tutorial on Soar at HCI International when it was in Japan and two invited lectures in Japan, has hosted a Japanese visitor, and published a paper in Japanese (Ritter, 2009) .

This tutorial has been given at the *Behavior Representation in Modeling and Simulation (BRIMS 2012)* conference. The tutorial will be slightly modified for attendees at the Cognitive Science Conference by making it less practioner/industry oriented, and making it more oriented for Asian and European researchers and for computer scientists. This will mean changing a few slides to represent problems more frequently found in academia than in industry, and assuming slightly different research questions are being asked, for example, a greater emphasis on cognitive science studies and less on controlled observation for product design.

(IV) Why it is appropriate to have a tutorial in the proposed area?

Practical skills on how to run studies are well known and well taught skills in psychology departments, but often not well known outside of psychology departments. Yet, in cognitive science, if the field believes in building computational models and gathering data to test those models (or starting the other way 'round, or having non-psychologists gather data), for example, work by Morita and colleagues (Morita, Miwa, Kojima, & Ritter, 2011), then how to gather that data is an important skill for every cognitive scientist, no matter their home discipline or outlook.

There are few teaching materials on the practical details on how to run studies, which this tutorial starts to address. So, this tutorial covers an established but not well documented or often formally taught common technique. The tutorial and related book will show that there are important aspects of this technique, and we would argue that without training these aspects are not well known to researchers outside of psychology, and put the resulting researchers and research done by those not trained at risk for failure, interpretable results, or incorrect results.

(V) The likely audience for the tutorial.

Earlier versions of he material have been used in teaching graduate courses at Carleton University (cognitive science, Canada), U. of Connecticut (human factors, US), Florida Institute of Technology (HCI), U. of Texas at Houston (medical informatics), Middlesex U. (HCI, UK), Georgia Tech (industrial engineering), and at Penn State (information sciences and HCI). So, we believe that is accessible and useful to undergraduate and graduate students who are working with human participant studies, but are outside of psychology departments.

So, the likely audience for the tutorial are students and researchers outside of psychology departments who are running studies with humans in cognitive science, HCI, and related disciplines. It will also be useful to researchers in industry who are interested in running safer, more efficient, more controlled experiments.

Acknowledgments

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