

A Web-Based System for Data Collection and Community Building

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Abstract

Your Psyche (<http://www.yourpsyche.org>) is a new web-based data collection system. This system was developed to take advantage of modern Internet technologies to create an engaging and rewarding experience for participants. Key to this effort is the development of a sophisticated and powerful feedback system that allows participants to see and understand the results of studies they have participated in. This feedback system not only allows participants to see how their results compare those of other participants, but also to see how the variables in the study relate to each other. The feedback system also allows participants to select specific comparison demographics: for example, a young female participant can see how her scores compare to those of other young females. Preliminary evidence is encouraging, but also suggests that participants are sometimes overwhelmed and confused by the sophistication of the feedback system. Additional work and innovation are needed to develop ways to present complex information in straightforward ways that lay persons can understand.

Your Psyche (<http://www.yourpsyche.org>) is a web-based system for conducting psychological studies. This system features a sophisticated and powerful graphics engine capable of providing participants with detailed feedback about studies they have participated in. A key feature of this web-based system is the ability to provide participants with immediate and detailed feedback about the research projects they have participated in. This feedback system goes far beyond merely presenting a few summary statistics; it allows participants to graphically view the effects of any experimentally manipulated variables, as well as the associations between any pair of variables measured in the study. This capability has implications for the way participants can be recruited to participate in psychological research, and for how psychologists conducting research can interface with the general public.

Current practices

Web-based studies are becoming more and more common in psychology. Web technologies have matured a great deal over the past decade, and services like Survey Monkey (<http://www.surveymonkey.com>) have made it extremely

easy to put surveys on the web. However, caution is in order, according to the APA task force appointed to study web-based research (Kraut et al. 2004). A real danger is that participants will take a poorly designed, uninteresting, or uninformative study, and decide not to participate again.

More generally, many psychologists have recognized that many study designs that have traditionally used laboratory data collection methods can be carried out more quickly and easily over the Internet. However, I believe Internet-based research has more to offer than a more expedient way to do the same old thing: it offers the opportunity to develop innovative and novel approaches to participant recruitment and data collection, approaches that are simply not feasible using traditional laboratory methods. While there have been some steps toward innovation and community building, a large number of currently active Internet-based research projects are simply not taking advantage of these opportunities. Of the over 300 active studies listed at <http://psych.hanover.edu/Research/exponnet.html> (a popular list of psychological studies on the Internet, maintained by John H. Krantz), about a third are hosted by Survey Monkey (<http://www.surveymonkey.com>), a service that does not facilitate inclusion of reaction-time based measures or detailed feedback to participants.

Another approach is needed, one that focuses not only on the immediate returns for researchers in terms of quick and easy data collection, but also on the long-term goals of increasing interest and participation rates among Internet users. Steps in this direction have been taken by several independent groups. For example, You Just Get Me (<http://www.YouJustGetMe.com>) provides an opportunity for participants to see how well others can guess their Big 5 personality traits. The popular Project Implicit web site (<https://implicit.harvard.edu>) is built around the implicit association test. However, the feedback provided to participants who complete studies through the Project Implicit web site is limited to a single piece of information indicating the relative strength of the participant's automatic associations. Perhaps the most effective implementation of a feedback system that I am aware of is that used by Your Morals (<http://www.yourmorals.org>). This system provides some study results, and allows participants to see how their scores compared to those of others. In my view, even these more sophisticated efforts leave much to be desired, espe-

cially in terms of the quality and sophistication of the available feedback. In light of this, I have recently created Your Psyche (<http://www.yourpsyche.org>). Your Psyche tries to take the best ideas from existing Internet-based data collection systems and build on them to create a truly engaging and interesting experience for participants, and to create a general-purpose framework for researchers to collect data in a wide variety of formats and on a wide variety of topics.

Guiding principles

The design of Your Psyche has been based on two guiding principles. First, the web site design was inspired by the recent rapid advancements in Internet-based technology more generally. In an age when you can write your term papers on-line using Google docs, on-line studies need to do more than replicate the experience of filling out a paper and pencil questionnaire. We can and should incorporate multimedia, interactive reaction-time tasks, and other modern technologies to create interesting and engaging experiences for our participants. We also can and should use modern web-development technologies and techniques, including dynamically generated and interactive pages.

Second, Your Psyche was designed around the idea that feedback can be motivating, interesting, and valuable. Most existing efforts to provide feedback to participants are fairly rudimentary. Modern web technologies enable us to go far beyond simple static scoring algorithms to create dynamic, interactive, and exciting feedback to participants.

Implementation and capabilities

Your Psyche incorporates many of the advanced features of other web sites, and improves on them. This has been accomplished in large part by resisting the temptation to reinvent the wheel; where possible, Your Psyche incorporates and builds on existing open source software projects.

Building on top of existing projects has a number of important advantages. By building the main portal on the Drupal (Buytaert 2010) code base, Your Psyche is able to leverage an existing user account system, which enables feedback persistence so that participants can return to the web site at any time after completing a study and view the most up-to-date comparison information. By using Lime Survey (Schmitz 2010) to provide the survey engine, Your Psyche is able to harness the result of thousands of man hours spent developing that software, including conditional branching, complex question types, and more. The web site uses PXLab (Irtel 2008) to provide flexible reaction-time based measures. Finally by using R (R Development Core Team 2010) and ggplot2 (Wickham 2009) to generate feedback for participants, Your Psyche is able to provide graphical displays at the cutting edge of modern graphical theory and implementation.

In summary, key features and capabilities include: 1) a user registration system that enables feedback persistence, 2) conditional branching and random assignment to different conditions or question orders, 3) reaction-time based measures and tasks, and 4) a sophisticated feedback system that allows participants to compare their scores to specific

demographics. Many of these features are already being used in existing web-based data collection systems. What makes Your Psyche interesting and novel is the combination of these capabilities and the enhancements that have been made to them. In particular, the the feedback mechanism represents a considerable advance in that it allows participants to select the specific information they wish to see. For example, participants can choose to see how their scores compare to other participants of their own age and gender, a capability that to the best of my knowledge is only available from Your Psyche.

Summary and directions for future work

Your Psyche is a modern, interactive web site that capitalizes on current web technologies. It incorporates the best features and ideas from previous efforts, and I believe it to be one of the most sophisticated data collection systems around. However, much remains to be done. First and most importantly, the effectiveness of detailed participant feedback as a motive to participate in studies hosted on Your Psyche has not yet been demonstrated. Research addressing this critical question is under way, but the results are unavailable at the time of this writing. Second, despite initial vows to limit studies on Your Psyche to those that could be completed in under twenty minutes, some of the studies currently running on the web site exceed this limit, with predictable results, i.e., high dropout rates. Moving forward, it is important to ensure that only relatively brief studies be allowed on the web site.

Finally, while there has been some interest in the project, it is important to do a better job of publicizing and promoting the service. Although much remains to be done, Your Psyche already represents an important advance in the way feedback in web-based studies can be presented to research participants.

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