

**Better Data, Better Writing, More Perspectives, Meeting Challenges**  
**Kimberly A. Barchard, University of Nevada, Las Vegas**  
**Bettina J. Casad, California State Polytechnic University, Pomona**  
**Wind Goodfriend, Buena Vista University**

Presented at the Western Psychological Association Annual Conference, in Irvine California, April 2008.

The handouts from this symposium are provided on the following website: <http://faculty.unlv.edu/barchard/>

### **Symposium Title and Abstract**

**Title:** How to do bigger better research: Collaboration tools for researchers

**Abstract:** Humankind is capable of amazing projects: building 100-story buildings and putting a man on the moon. These amazing projects require collaboration between hundreds and sometimes thousands of people. In science, we are mostly operating on a single-scientist model, in which a single person (or perhaps two or three people) comes up with a research idea, runs a study, and writes a paper. Because of the time-cycle of Masters, PhD, tenure, and full professor, each project must also be short: something that one or two or three people can do in just one or two years. This encourages a large number of small projects which were done because they were easy, cheap, and fast, not because they were important or good. Imagine what we could accomplish if we instead had 100 scientists working together to do the best project they possibly could? Right now, there are a moderate number of psychological projects that are done with 10, 20, or even 50 authors, but these projects are rare. The challenge is that we do not have organizational models for how to get 10 or 20 scientists to work together productively, and do not know how to use the software that would allow this type of collaboration.



The purpose of this symposium is threefold: (1) to discuss the benefits of working together in larger groups and how to overcome the difficulties associated with collaboration, (2) to discuss and demonstrate software that can be used to facilitate collaborative data collection, collaborative writing, and long-distance meetings, and (3) to discuss structures, communication norms, and protocols that can be used to coordinate work across institutional boundaries.

### **Presentation Abstract**

Collaboration has many benefits. In terms of study design, collaboration allows researchers to combine their ideas, to create more comprehensive and higher quality projects. In terms of data collection, collaboration can allow researchers to collect larger samples and higher quality data. It also provides researchers access to a wider variety of resources, because resources differ from one institution to the next. In terms of writing, collaboration allows different voices and perspectives to be heard and incorporated. Finally, collaboration promotes relationships in the field that go beyond single, brief encounters. Greater interactions among researchers will allow them to build upon each others' ideas, promoting more progress in the area. Thus, collaboration can only increase the quality and relevance of research.

On the other hand, collaboration is difficult, and few psychologists receive formal training in how to collaborate effectively. This presentation will discuss several challenges and how to overcome them for collaborative projects to be successful. One of these challenges is the evaluation of contribution. When there are many authors, how can authors and institutions determine the relative contribution of each? Order of authorship must be agreed upon early in a project. Alphabetical authorship is one option. Another issue is social loafing. Researchers can keep all team members motivated to contribute by breaking a large group into smaller subgroups. A third issue is difficulty finding collaborators. Although most departments do not have many people interested in the same topic, researchers can search published articles and conference programs for possible collaborators. Finally, there are technical and social challenges. Few psychologists have training in the new technical tools that facilitate collaboration, and few have learned about strategies for social interactions that allow researchers to work together effectively. The remainder of this symposium will discuss technical tools for collaborative data collection, collaborative writing, and long-distance meetings; and structures, norms, and protocols to assist researchers in working together effectively.

## **Presentation**

Collaboration has benefits for both data collection and writing, whether you are working in just a small group of people or a large group of people. Collaborating is also challenging. This presentation will discuss some of the challenges of collaborating with other researchers, and how to meet these challenges.

I'll start by talking about the benefits of collecting data with one or two other researchers.

### **Benefits of Collecting Data with One or Two Other Researchers**

If more researchers are involved in data collection, then larger samples of better data can be collected. Many faculty members already have several people involved in data collection, because they have graduate and undergraduate students help them collect the data. But having several faculty members involved, each of whom has several students working with them, allows even more data collection. Having more researchers involved in data collection allows several benefits.

#### Access to more resources

This includes physical resources such as a large subject pool, funding to pay for a proprietary test, an fMRI or eye-tracker. This also includes knowledge resources, like knowing different methods of data collection (such as the creation of Internet studies and the use of Eprime), knowing additional languages so they can translate materials, and having additional contacts so that they can locate more sources of participants.

#### More time-consuming data collection

If there are more people involved in the data collection, it is possible to spread the work between them. For example, researchers can use individual administration rather than group administration, can use interviews rather than paper measures, and can use multiple time points or multiple data sources (such as student, teacher, parent, and peer report).

#### More time-consuming scoring.

If there are more people involved in scoring, it is possible to spread the work between them. This allows researchers to use scoring techniques that are labor intensive. For example, researchers could use open-ended tests that require subjective scoring, could code videotaped interactions, could transcribe and score interviews, and could have multiple scorers for each participant. This also allows for better assessment of interrater reliability, since raters may be from different research labs.

#### More expensive data collection and scoring

Because costs can be spread between more people, research projects can use more expensive data collection procedures and more expensive scoring procedures.

#### Larger samples

Because there are many people involved in collecting the data, then within the same time-frame, it is possible to collect a larger sample. Alternatively, if a certain sample size is needed for a specific statistical test, then the required sample size can be collected more quickly. For example, current recommendations for exploratory factor analysis is that the sample contain 300 people.

#### More diverse samples

The research team can collect data from more than one location, and so can include different types of participants if that is desired. This can provide a more representative sample, increasing the external validity of the study.



#### Analysis within subgroups

If the sample is both large and diverse, this might allow the analysis of results within subgroups (such as men and women), to ensure that conclusions that are made about the entire sample apply to subgroups within that sample. For example, if there were at least 300 men and 300 women, separate exploratory factor analysis could be done in each group and then compared. Having a very large sample may allow researchers to explore differences between groups that comprise only a small portion of the sample, such as ethnic minorities, or people with physical or mental

illnesses. For example, to determine if the factor structure for Hispanics, African Americans, and Whites were the same, ideally the researcher would have 300 of each. And to determine if the factor structure was the same for people with schizophrenia and autism, 300 people with each disorder would be ideal.

### More homogeneous samples

Rather than getting a diverse sample, the research team might instead take the exact opposite approach, and recruit a more homogenous sample. Because they have access to a greater number of potential participants, if they want, they can be more selective about whom they include as a research participant. For example, they might include only people who are diagnosed as having major depressive disorder, rather than having to include people who have non-clinical levels of depression. Using more homogeneous samples increases statistical power and makes conclusions clearer.

### Specialization

If one person completes a study by themselves, they have to do everything. But if there are several people involved, then some of them may be involved in grant writing, some can be involved in data collection, and some can be involved in the statistical analyses. So, if there are several people involved in a project, one of the advantages for data collection is that not all of them have to collect data.

### Benefits of Collecting Data with a Large Number of Researchers

There are some additional benefits that come from working with a large number of other people. Some research projects involve 20, 50, or 100 researchers. As the number of people increases, it becomes possible to collect data sets that would be simply impossible if there were only a handful of researchers. It is possible to collect data from thousands of participants, and from dozens of countries. It is possible to translate a study into dozens of languages. It is possible to replicate the study using a dozen slightly different sets of procedures and stimuli, to ensure that results are not an artifact of methodology.

Thus, researchers can collect data that are important, rather than just being fast and easy.

### Benefits of Writing with One or Two Other Researchers

Collaboration also has benefits for writing. If researchers work in small groups, this will improve the writing because the research team will have:

#### More expertise

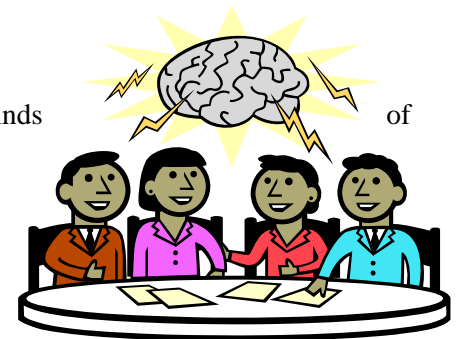
If more people are involved in writing a report, then they will have more expertise. Even if the researchers are in the same content area, they will have read slightly different papers, conducted different experiments, and had different personal experiences. They can build their research project upon this larger combined knowledge base.

#### More data analysis skills

If more people are involved, then they will likely have different skills in statistical analyses and displays. The team can agree upon what kinds of analyses and what kinds of graphs and figures to include, and then the people who are experts in those can be responsible for generating them.

#### More perspectives

There are benefits from working with people with different backgrounds and perspectives. Each expert has been trained in a specific body of knowledge. Even within any content area, experts have different theoretical perspectives, and interpret evidence in different ways. Each is an expert in a specific way of thinking (such as a particular theoretical perspective) and the knowledge that has resulted from using that perspective to collect and analyze data. By getting people involved who have different backgrounds and perspectives, a research report can build upon a much wider range of knowledge. Having people with different perspectives can ensure that the study and the paper do not have a fatal flaw because the researchers overlooked a theoretical objection from another perspective. Having people with different perspectives allows researchers to develop studies that compare different theories to find out which one accounts for the data the best. Moreover, it can also create something new, something that could not be created in



either specialty area, because it combined perspectives from more than one area. In this way, projects can be more creative and innovative.

Let me give you an example from one area in psychology is inherently multi-disciplinary: neuropsychology. Jefferson Kinney, a faculty member at the University of Nevada, Las Vegas, was involved in a research project a few years ago that examined the role of a specific signaling pathway in epilepsy. The research team involved five labs from different specializations (who happened to be spread across four institutions):

Molecular biology- to characterize the synthesis and binding properties of several compounds

Electrophysiology- to determine the activity the compounds produced on cellular function

Genetics- generation of a transgenic animal model relevant to the disorder

Behavioral genetics- working with animal models that had a specific gene deletion of a receptor

Chemistry- worked on a synthetic analogue of the endogenous compound

This research would not have been possible without the collaboration of people with these many different backgrounds and perspectives.

### Broaden their perspectives

Working with people from different backgrounds can broaden researchers' own perspectives. They will learn about other topics, issues, and approaches. Sometimes it will teach researchers to question things that they previously found self-evident.

### Specialization: not everyone has to write

Having multiple people involved in a research project allows team members to specialize. Content experts can pick research questions that are important; statisticians can focus on good data analysis; and technical experts can get the computer software to run. When one researcher or a small team of researchers has to do everything, they cannot become experts in everything they do. By having more people involved, each aspect of the project can be done better.

### More fun

Working and writing in a group can simply be more fun. Often, the academic world can be competitive and isolating. Working together as a team builds positive relationships and allows people to support each other. It makes the work more interesting and increases motivation. It assists researchers in building contacts that may help them in other projects or later in their careers.

### Benefits of Writing with a Large Group of Researchers

If researchers work in large groups, there are some additional benefits. By having many people involved in a research project:

#### Wider literature review

Researchers can ensure that the relevant literature from many different areas is included.

#### Review specific parts of paper

Experts on each topic can review the parts of the paper that they are most knowledgeable about.

#### Esoteric data analysis skills

Researchers will have many more data analysis skills, including esoteric skills. Perhaps one team members knows how to run a bootstrap confidence interval for a statistic for which the sampling distribution is unknown. Perhaps another knows how to use modern methods of missing data analysis.

### Specialization: Not everyone has to write

If some people are good at writing, then they can do most of the writing. If some people are bad at writing, then they can focus on what they are good at and others can edit their contributions to the paper.



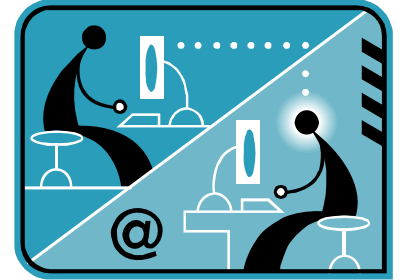
## **Challenges of Collaborative Research**

There are also several challenges associated with collaborative research. See Table 1 for a summary.

### ***Challenges Creating a Team***

#### **Finding collaborators**

Most academics work with just a few other people in their content area, and they may not know 10 or 20 or 50 other people who they could work with on a project. To solve this problem, the Principle Investigator should have a clear idea of the goal of the project and how work will be coordinated, and then contact possible collaborators. There are different ways researchers could find possible collaborators. One relatively common method is to contact previous graduate students or advisers. They may be willing to collaborate and may know other people who would be interested. Another strategy is to look at published papers and at conference programs. If a researcher contacts many people, they will likely be able to find several people to work with on the project. For example, for this symposium, Kim sent emails to 12 people who attended WPA in 2007 and presented research involving several authors from several institutions. Within one day, she had found two additional faculty members who were interested in collaboration, and one of them was able to suggest a third.



#### **Creating and maintaining a vision, goal, and sense of purpose**

A large group of people standing around together does not accomplish much. In order for a group of people to accomplish something amazing together, they need to have a shared vision or goal, a sense of purpose that is driving their efforts. A researcher should not start a collaborative project and hope that one of the collaborators will provide the motivation to keep the project going. The group of people who start the project must have great enthusiasm and passion. They must have the energy to overcome obstacles and keep the project going if some of the collaborators drop out. Without at least one person providing this strong sense of motivation, the project should not be started at all. To help create and maintain a shared sense of vision, researchers should generate a statement of goals up front, so everyone knows what the purpose and scope of the project is. This is briefly discussed in the talk "Structures, Norms, and Protocols for Collaborating across Institutional Boundaries."

Table 1

### ***Challenges in Collaborative Research***

#### **Challenges Creating a Team**

- Finding collaborators
- Creating and maintaining a vision, goal, and sense of purpose
- Avoiding spectators and diffusion of responsibility
- Creating a sense of community

#### **Challenges Working Together**

- Different time lines for completion
- Standardizing procedures
- Disagreements with collaborators
- Difficulty communicating with people with different backgrounds
- Team members who do not fulfill promises
- Getting people to work together effectively

#### **Technical Challenges**

- Differences in software and hardware
- Having to take turns working on the project
- Ignorance of tools

#### **Challenges Getting Credit**

- Disagreements or confusion about order of authorship
- Obtaining institutional and scientific recognition for one's contributions



### Avoiding spectators and diffusion of responsibility

In order to keep people involved and productive, they need to feel accountable for their work. If groups are too large, then individuals may feel invisible; they can hide and fail to do any work. One possible solution is for the Principle Investigator to have a personal one-on-one relationship with each contributor. Each contributor will feel that they are being held individually accountable for the work they are doing. This approach may work effectively in a moderate sized group (e.g., up to 10 people) but will not be feasible in a very large group (e.g., with 50 or 100 authors). Another solution, which should work regardless of group size, is to create subgroups within the larger group. These subgroups could all be working on the same task (like different tables at a focus group meeting) or could work on different tasks (like a data collection group and a writing group). According to one Management Professor, groups can have up to 5 or 7 team members and still be productive. Later in this symposium, in the talk "Structures, Norms, and Protocols for Collaborating across Institutional Boundaries," we will talk about how researchers can organize large groups of people.

### Creating a sense of community

Sometimes authors may never meet each other in person. This can make it difficult to create a sense of community and involvement. One solution is to share pictures and personal descriptions for all collaborators. If the collaboration is based primarily on email, each collaborator can send their picture and a brief description of their personal interests. Better yet, the group can create a shared private space that includes pictures and descriptions. For example, the team could use a password-protected web page. Alternatively, they could use a Private Wiki or a Private document on Google Docs; these tools will be described later in our symposium. Finally, they can use technology to allow long-distance meetings. These include tools such as teleconferences and video-conferences. These will be described later in our symposium, in the talk "Long-Distance Meetings".



### ***Challenges Working Together***

#### Different time lines for completion

Some team members may be thinking of completing the project in a few months, others in a few weeks. Some may be planning to do the work over the entire time available, and others may plan to do it right before the deadline. When collaborators are working on different time lines for completing the project, they are likely to be unavailable when their team members need them. This can lead to frustration, inefficiency, delays, and project failure. To address this, create a plan of action, including a time-line, up front. This will also be discussed briefly in the talk "Structures, Norms, and Protocols for Collaborating across Institutional Boundaries."

#### Standardizing procedures

If you are collecting data in several labs, it is important to use standardized procedures at all data collection sites. We recommend that collaborators discuss the physical settings where data will be collected, write down the procedures, and use a script when administering the study. Visiting each other's labs is helpful if this can be arranged. Pictures or videos of the lab space could also be helpful. Researchers may also consider using the exact same experimental materials in each location, but putting the study on the Internet, and accessing it through the computer. Then the only thing that needs to be standardized is the location and the computer equipment. Later in this symposium, we will talk about how to create a study on the Internet.

If scoring is done in several labs, it should be standardized. Written instructions should be given for the scoring. If subjective scoring rules are used, scorers from each site should communicate with each other. They should also assess the inter-rater reliability of scores across sites.

If data entry is done in several labs, it too should be standardized. Ideally, a single data entry procedures will be developed and then used by all sites. For example, if an Excel spread sheet is being used to enter the data twice, compare the entries to ensure they match, and to check that all values are within the allowable range, then that same spreadsheet should be used in all locations. Written instructions should be given on how to do the data entry, and how to resolve problems with the data entry. The data should be periodically compared between sites to ensure consistent implementation of the procedures.

### Disagreements with collaborators

All people are unique: they have different work styles, different communication styles, different opinions. As the number of collaborators increases, disagreements become more likely. How can researchers prevent these disagreements from incapacitating a project? There is no single solution to this issue. We recommend that collaborators take several steps to reduce the influence of disagreements on work productivity and project success.



First, it is helpful to obtain references for potential collaborators. If the researcher knows someone who knows the potential collaborator, then they can ask the common acquaintance what that person is like to work with. If a few people who have already agreed to work on a project, they can suggest other collaborators who they have enjoyed working with. This may help researchers avoid getting into a work relationship with someone who is destructive, mean, or simply inconsiderate. This may be particularly important if one collaborator is senior to another, because the junior colleague will have a harder time extracting themselves from the collaboration if it isn't working out.

Second, researchers should go slowly when they first suggest collaborating with someone they don't know well. Have email and phone conversations about the research area before agreeing to collaborate. Start by collaborating on a small project rather than a big project. For example, collaborators might want to do a conference poster together before writing a proposal for a multi-year grant.

Third, it is helpful to simply realize that there will be disagreements. The fact that authors disagree with each other does not indicate that there is anything wrong with any of the individuals involved, or that the project is doomed to failure. Disagreements should be expected. The best collaborative projects may be the ones that involve people who have very different perspectives on a topic, and those projects will have the most disagreements.

Fourth, it is very helpful to have norms and protocols in place, to facilitate clear communication and smooth work relationships. We will talk more about norms and protocols later in the symposium, in the talk "Structures, Norms, and Protocols for Collaborating across Institutional Boundaries."

Finally, it is important that you have a plan in advance for resolving disagreements. One traditional solution is to have a designated Principle Investigator for the project. Whenever there are disagreements, the parties could express their ideas to the Principle Investigator, and then the Principle Investigator could make the final decision. Another method is for the Principle Investigator to make many decisions before collaborators are invited to join the project. If potential authors disagree with how the Principle Investigator wants to do the project, they can either put up with it or not join in the first place. A third method would be to have a pre-arranged mediation mechanism. The most important thing is to realize there will be disagreements and to plan in advance how to resolve them.

### Difficulty communicating with people with different backgrounds

We talked with one psychologist who works with linguists, sociologists, lawyers, and arts students. Communicating successfully with people from such different backgrounds is an additional challenge. That psychologist offered the following advice:

- 1) Listen to the other side; try to understand what is self-evident for them. And respect a scientific approach that is different from yours. It is still scientific.
- 2) Explain what psychology does and how we do it: many people still confuse psychology with psychotherapy or psychiatry. Make sure that others do not see our intention to understand human experience and behavior as exclusive.
- 3) Never take for granted we talk about the same things: many terms have different meanings in the different sciences (for example when a lawyer talks about 'norm' it does not mean what we might think it means).
- 4) Always show interest and respect (and feel it!)

### Team members who do not fulfill promises

Sometimes team members let each other down. Sometimes crises occur so that they cannot contribute, and sometimes people simply lose motivation. At the least, this can cause delays and frustration, and in some cases this can cause project failure because critical contributions are not made. To prevent this problem, researchers should compare schedules in advance so that they can anticipate absences and so that researchers can avoid getting into a project with

a collaborator who will be unable to maintain their involvement during the time-period of the project. This is discussed briefly in the talk "Structures, Norms, and Protocols for Collaborating across Institutional Boundaries." Once a project has started, researchers should make sure that all team members have access to all project materials (study materials, data, current draft of paper), so that they can carry on if one team member drops out.

### Getting people to work together effectively

Collaboration may be more beneficial if there are a large number of people working on a project, or if the contributors have different backgrounds and perspectives. However, it may be difficult to organize and coordinate the activities of a large number of people. And it may be difficult to get people who have very different perspectives to work together effectively. Therefore, our last presentation will discuss structure, norms and protocols that facilitate collaborative work.

## ***Technical Challenges***

### Differences in software and hardware

When collaborators are using different operating systems or different software programs, this can cause delays and frustrations. Sometimes files will not open on the other system, or formatting will be lost. Fortunately, there are now common file formats, such as rich text format and pdf, that allow collaborators to transfer files between programs and between operating systems. As well, there are Internet-based tools that can be accessed by any computer and any browser. If collaborators keep their project files on the Internet itself, then the browsers take care of the translation issues. We will discuss some of these Internet-based tools in the talks "Tools for Collaborative Data Collection" and "Tools for Collaborative Writing".

### Having to take turns working on the project

Usually, collaborators have to take turns working on the project. They send the files back and forth, and only one person can be working on each file at a time. This slows down collaborative work because team members cannot work on the project continuously. With a large number of contributors, this may introduce substantial delays and may even threaten the completion of the project. Even if there are just two collaborators, this can be problematic, because one team member can effectively hold the project hostage.

If collaborators will take turns working on the project, it is critical that each team member knows who has the active copy of each file. This way, they can ensure that they do not over-write each other's work and that two people are not duplicating each others' efforts. A file-check-out and check-in system can assist with this. Some programs have this set up automatically, so that each collaborator knows if someone else is working on the file. Or the team can simply create a list of who is working on each file.

A complete solution to this problem is to use software that allows multiple people to edit the files at the same time. This is referred to as simultaneous editing. We will discuss some of the tools that allow simultaneous editing in the talks "Tools for Collaborative Data Collection" and "Tools for Collaborative Writing".

### Ignorance of tools

Psychologists do not use or are not aware of the software and technical tools that can be used to facilitate collaboration. In the paragraphs above, we talked about Internet-based programs that eliminate the problems with system and software incompatibility and we talked about software that allows simultaneous editing; but few researchers know about this software. There are software tools to facilitate collaborative data collection, collaborative writing, and long-distance meetings. Our next three talks will discuss technical tools that can facilitate these. We will provide an introduction to many of the tools that exist.



## ***Challenges Getting Credit***

### Disagreements or confusion about order of authorship

When two or three people are involved in a project, they are likely to all know how much each person contributed, and be able to come to an agreement about their relative contribution. However, when many people are involved in a project, it can be difficult to determine the relative contribution of each person. Traditionally, authorship is determined by the extent and importance of each person's contribution. But when there are many authors, they may



not be fully aware of what each other author is contributing. This problem is compounded if the authors are spread across multiple institutions. The APA Ethics Code specifies that authors should discuss the order of authorship early in a project. This is even more critical for a project with many authors. We recommend that order of authorship be established at the very outset of the project, so that each person comes into the project knowing how authorship order will be determined.

### Obtaining institutional and scientific recognition for one's contributions

Probably one of the most critical challenges to collaborative projects is difficulty obtaining recognition for one's work. In academia, order of authorship is often used to evaluate how much a person contributed to a project. If there are many authors or if a person is listed far down on the list of authors, then many people will assume that the person contributed little to the project. This poses a severe challenge to collaborative projects that attempt to improve the importance and scope of the research by involving many people. If 50 people work 20 hours per week on a project for two years, then they can accomplish a lot more than if 2 people do so. But how can researchers obtain recognition for this type of work?



Here are some partial solutions, which assume we will still evaluate contribution by rank ordering authors.

- 1) If a project results in several conference presentations or publications, order of authorship can be varied. If there are only a few authors (e.g., less than 10), each person can be listed near the beginning of the list for some products.
- 2) If a project results in several conference presentations or publications, the collaborators can choose to list only a few people as authors on each product. The other collaborators can be listed in an acknowledgment for providing feedback and suggestions. Once again, this will likely only work if there are just a few authors (e.g., less than 10). If there are 50 or 100 authors, it will likely be impossible to create enough presentations and publications to give each author sufficient credit for their efforts.
- 3) Authors can be listed in alphabetical order, with a note specifying that this is the case. This way, no authors are marginalized because they are far down on the list. However, many people will still think that each person must have contributed very little, if so many people were required to write just one paper.
- 4) If one or two people do most of the work, then they can be listed as the first and second author, and then the rest of the authors can be grouped together into an alphabetical list. This was the strategy that Robert Sternberg used for the Rainbow Project. They published under the authorship of Robert Sternberg and the Rainbow Project Collaborators, and a footnote listed the people who were a part of the Rainbow Project Collaborators.
- 5) More than one person has suggested that people self-select themselves onto collaborative projects, so that only people who do not need recognition for their work become involved. For example, maybe only tenured faculty members should contribute to a project that will have 50 authors. This strategy would severely limit the number of collaborative projects.

### A complete solution

- 1) A full solution of this problem requires us to create new ways of evaluating and recognizing the contribution each person makes to a project. The current method of evaluating a person's contribution is to rank order all authors. This is a simple but impoverished method of evaluating job performance. Instead, we could invent a new system. For example, we could evaluate each person's contribution to the many different facets of a project using written evaluations by one's supervisor and peers on the project. These contributions could be summarized verbally or numerically, and made available either as an appendix to the paper or in another location such as a web site.
- 2) In addition, we need a method of taking into account the scope of the project. Readers usually cannot tell from the APA reference on your CV whether the project involved 50 participants or 5000, and often cannot tell if it involved a 10-minute survey or a 10-year longitudinal study. We need a method of evaluating the scope of the project, so that readers (such as tenure committees and hiring committees) can understand that it might really take 50 people to collect data from 5000 participants over 10 years. Perhaps the routine inclusion of abstracts would be useful.

### Conclusions

Together, people can accomplish projects that would be inconceivable for a single individual. When researchers work together, they can collect higher quality data from larger samples. They can also create projects that build bridges across

disciplines, conducting studies that cannot even be conceived within each discipline. But working together is challenges. This presentation has also discussed how to meet some of the challenges in forming teams, working together, and obtaining credit for ones work. With practical advice about how to work together across disciplines and institutions boundaries, and information about some of the technical tools now available, these challenges can be overcome.

### **Acknowledgments**

We wish to thank the following people for their helpful feedback on this presentation.

Alexis Kennedy, University of Nevada, Las Vegas

Jefferson Kinney, University of Nevada, Las Vegas

Shatoya Burns, University of Nevada, Las Vegas

Several anonymous members of the Society of Personality and Social Psychology listserv, who provided useful suggestions on the benefits and challenges of collaborative research projects.