A Suggested Procedure for Determining Order of Authorship In Research Publications

ROGER B. WINSTON, JR.

A schema for analyzing contributions to data-based professional publications, assigning relative weights, and thereby determining the appropriate order of listing authors and identifying ancillary contributions is suggested. An example application of the procedure is also presented.

A recurring problem for those who write with others for publication in professional journals is the determination of whose name should be listed first, that is, who is to be designated as the senior author. Journal editors sometimes are confronted with claims from writers, especially young professionals, that older practitioners or teachers seek authorship credit that is unjustified. Some established professionals seem to believe that by virtue of their position and tenure in the field, they are entitled to senior authorship on any joint publication activity in which they are involved. Likewise, some professionals in supervisory positions maintain that if they give support (e.g., providing an assistantship or institutional funds to cover costs such as postage) or offer suggestions during a research project, then they are entitled to be listed as authors. Such contentions create both ethical and professional dilemmas for which there are presently few agreed upon ways of addressing.

The American Association for Counseling and Development (AACD) Ethical Standards give only vague, general guidance in this matter:

D-12. The member must give due credit through joint authorship, acknowledgement, footnote statements or other appropriate means to those who have contributed significantly to the research and/or publication, in accordance with such contributions. (Callis, Pope, & DePauw, 1982, p. 12)

The American College Personnel Association (ACPA) Statement of Ethical and Professional Standards (1981, p. 187) somewhat more specifically addresses these points:

F-8. Members acknowledge major contributions to research projects and professional writings through joint authorship, listing the author who made the principal contribution first. Minor contributions of a professional or technical nature are acknowledged in footnotes or introductory statements.

F-9. Members do not demand co-authorship of publications when their involvement has been ancillary. Teachers and/or supervisors exercise caution when working with students and/or subordinate staff so as not to unduly pressure them for joint authorship.

Because of the pressures some faculty members feel to accumulate long lists of publications in order to meet the competition for promotion and tenure, there seems to be an increased number of complaints from students that their professors are demanding unjustified co-authorships of publications. Gladding (1984) analyzed the contents of the Personnel and Guidance Journal (1971–1982) and found that there was a substantial increase in the number of multiple authors of articles—from an author/article ratio of 1.2+ in the 1970s to 1.6+ in the early 1980s. A similar trend was detected by Strahan (1982) in the Journal of Counseling Psychology.

The American Psychological Association (APA) Ethics Committee has adopted a policy statement designed to guide its journal editors in considering complaints involving dissertations. Important points in that statement include: (a) dissertation supervisors may be only second authors; (b) second authorship is obligatory if the supervisor designates the primary variables, makes major interpretive contributions, or provides the data base; (c) second authorship may be extended as a courtesy if the supervisor is substantially involved in developing the research design or measurement techniques/data collection, or if the supervisor substantially contributes to the writing of the publication; and (d) authorship is not acceptable if the supervisor only gives or provides encouragement, facilities, financial support, critiques, or editorial assistance (Fields, 1983).

Spiegel and Keith-Spiegel (1970) sampled a large group of psychologists, presenting them with a number of vignettes and asking them to whom authorship credit should be extended. They concluded that the "creative aspects" of research warranted greater credit. There were, however, many differing opinions on how to determine authorship credit.

In a survey of academic psychologists, Bridgewater, Bornstein, and Walkenbach (1981) found that those who responded ranked research design and report writing as the activities that most justified authorship recognition. The respondents, however, indicated that performing statistical analyses and collecting data (even when professional skills were required, such as in projective techniques) warranted only footnote recognition. It was widely held that time invested in the research was not a sufficient gauge for determining order of authorship. Both of the two mentioned studies found that psychologists overwhelmingly believed that power and status should never enter into the determination of authorship credits.

Even if the APA, AACD, and ACPA guidelines are accepted and applied in good faith, conscientious, ethical professionals still have a problem when they are required to make a determination of what constitutes "ancillary involvement" and who made the "principal contribution" in publications not involving dissertations. What is needed are guidelines or "rules of thumb" that can be used to help resolve these questions.

The following schema is proposed to help address these issues. It is intended to help identify clearly the contributions
made and to aid in decision making, but it is not a substitute for sound judgment and personal and professional integrity.

The schema uses a weighted point system to aid in the decision-making process. In Table 1, 11 activities or processes are identified that are often involved in the planning, conducting, and reporting of a data-based research study that culminates in a journal article or book chapter. (Activities are presented in the order that they are generally encountered in the research process.) Persons involved in the research should, as a group and through consensus seeking processes, assign points to each person.

Some tasks, although critically important to the success of the project, require less skill, knowledge, and research sophistication than do others. Examples include searching of the professional literature, clerical tasks (e.g., duplicating and preparing instruments for mailing), and data collection and preparation when using standardized instruments. Contribution in these areas is reflected most accurately by the proportion of time that each researcher spent in what is sometimes called the "scullery work" of research. Contribution to other tasks (e.g., research design or conceptualization of the research problem) can be judged most appropriately by considering the quality of the contribution and how essential it was to the successful accomplishment of the task. This is basically a subjective process that requires the assignment of relative value to each contribution. One approach might be to have each researcher independently assign a percentage value to each qualitatively based category and then compare results. The group can then reach a consensus about assigning points. Weights (points in each category) were assigned based on the author's judgment of how critical each category of activities typically is to successful research studies.

**EXPLANATION AND EXAMPLE OF APPLICATION**

In order to assist the reader in understanding the proposed schema, an example application of the procedure involving the author and three others is presented in Table 2 and explained below.

**Conceptualizing and Refining the Research Idea**

Points should be assigned to each participant according to the contribution he or she made in the formative conceptualization process. Most studies originate when a person notices a gap in the literature, becomes puzzled by something associated with his or her job, or becomes interested in explaining or testing a proposition suggested by some theory. Although one person may first propose the study, collaborators often take the germinal idea and develop it to the point that a feasible research study emerges. Discussion among participants can generally produce agreement about an equitable allocation of the 50 points.

**Example:** Student A proposed the research problem and, with Professor B, determined the basic approach to the research and variables to be investigated. Thirty points are assigned to A and 20 points to B, reflecting their relative contributions.

**Literature Search**

Once the research ideas begin to take shape, it is important to search the literature to determine what has been reported about the topic and related areas, to identify research strategies and techniques, to identify possible data collection instruments and techniques, and to establish a theoretical framework for investigation of the problem or determine if there is really a need for further investigation. This is often very time consuming work. One may assign the 20 points in this category to researchers according to the proportion of the total time spent in the search process.

**Example:** Fifteen points are assigned to A, who spent the most time in the library. Three points are assigned to B, who contributed two articles from his personal library, and two points are assigned to graduate assistant C, who volunteered to assist with the project and contributed an extensive annotated bibliography on the subject.

**Creating Research Design**

How carefully one conceives and executes the research design will determine to a large extent how valuable the results are, and even whether conclusions can be drawn at all. Researchers should assign the 30 points available in this category after dis-

---

**TABLE 2**

**Example of Use of Schema with Data-based Research Manuscript**

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Points</th>
<th>Method of Assigning Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptualizing and refining research ideas</td>
<td>50</td>
<td>Q</td>
</tr>
<tr>
<td>Literature search</td>
<td>20</td>
<td>T</td>
</tr>
<tr>
<td>Creating research design</td>
<td>30</td>
<td>Q</td>
</tr>
<tr>
<td>Instrument selection</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Instrument construction/questionnaire design</td>
<td>40</td>
<td>Q/T</td>
</tr>
<tr>
<td>Selection of statistical tests/analyses</td>
<td>10</td>
<td>Q</td>
</tr>
<tr>
<td>Performing statistical analyses/computations (including computer work)</td>
<td>10</td>
<td>Q</td>
</tr>
<tr>
<td>Interpretation of statistical analyses</td>
<td>10</td>
<td>Q</td>
</tr>
<tr>
<td>Drafting manuscripts</td>
<td>60</td>
<td>T</td>
</tr>
<tr>
<td>First Draft</td>
<td>60</td>
<td>T</td>
</tr>
<tr>
<td>Second Draft</td>
<td>30</td>
<td>T</td>
</tr>
<tr>
<td>Redraft of a paper (on later drafts)</td>
<td>20</td>
<td>T</td>
</tr>
<tr>
<td>Editing manuscript</td>
<td>10</td>
<td>T</td>
</tr>
</tbody>
</table>

*Q = points assigned on qualitative criteria; T = points assigned based on proportion of total time spent on the task or on proportion of total pages drafted or revised; Q/T = points assigned partly on the basis of time spent on the task and partly on qualitative criteria.
cussing the relative contributions of each; no predetermined guidelines seem adequate.

Example: Twenty points are assigned to B, who is most knowledgeable about research designs and who proposed the basic design used in the study. Five points each are assigned to A and C, who helped refine the design and shared in the decision-making process.

Instrument Selection
Finding a research instrument that can adequately measure the variables under investigation and that possesses satisfactory reliability and validity is another important part of the research process. In order to receive points from this category, the level of involvement must exceed simply suggesting an instrument. Rather, one must be involved in evaluating the appropriateness of its use in the study and its reported reliability and validity. Points (10) are apportioned according to level of participation and use of expertise in the process. Instruments are often "discovered" during the literature search. In this event, points should be assigned on the basis of time spent (a) investigating reliability and validity, (b) researching other studies using the instrument, and (c) making points on this category.

Example: B is assigned eight points because he suggested the instrument (which he had investigated and used before), provided copies and a manual, and had already determined that it possessed appropriate reliability and validity for the study. A is assigned two points because he searched the literature for previous studies using the instrument and provided additional technical evaluations.

Instrument Construction and Questionnaire Design
Instrument construction is generally time consuming and frustrating work. If the research project requires construction of new data collection instruments beyond demographic-type questionnaires, the final outcome of the study hinges upon how well this task is accomplished (often measured in terms of reliability and validity). The 40 points in this section should be apportioned as follows: (a) 20 points assigned based on the quality and usefulness of ideas contributed, and (b) 20 points distributed based on the proportion of total time spent creating the instrument and determining its psychometric properties (e.g., writing items, collecting and analyzing reliability and validity data, creating norms). If it is unnecessary to create a new instrument, do not assign points in this category.

Example: No points are assigned in this category because no new instrument was created.

Selecting Statistical Tests and Analyses
Determining the kinds of statistical analyses to be used in testing hypotheses is an important part of the overall research design. How precisely the instruments measure and the size of the sample (and subgroups within the sample) determines which statistical procedures can be used appropriately. The 10 points in this category should be assigned based upon a determination of the quality of construction made in the area of statistical analysis. It is not uncommon to seek expertise from a statistician whose consultation is the sole involvement in the project. When such is the case, the consultant generally will not accumulate enough points to qualify as an author, but can be recognized in a footnote.

Example: Staff member D acted as a statistical consultant to the research team and suggested a sophisticated statistical treatment for data analysis. He is assigned eight points. B receives two points because he generally knew what treatment would be appropriate, but he lacked sufficient in-depth knowledge to use it without assistance.

Collection and Preparation of Data
Data collection, though undeniably critical to the success of any research study, is usually tedious work. The 40 points in this category should be allocated to each person according to the proportion of the total time he or she spent gathering, scoring, evaluating, coding, and keypunching the data.

Example: Twenty-eight points are assigned to A, who collected most of the data over a 2-month period. Ten points are assigned to C, who scored and coded the data for analysis, and two points are assigned to B, who gathered data from one class.

Statistical Analysis and Computations
The 10 points in this category should be allocated on the basis of the proportional amount of time each researcher spent performing the statistical analysis, including writing computer programs.

Example: C is assigned all 10 points because she entered the data into the computer and wrote the program for the statistical analyses.

Interpretation of Statistical Analysis
Once the statistical analysis has been performed, care must be exercised so as to ensure that unwarranted conclusions are not drawn and that all technical restrictions and assumptions associated with the tests are respected. A background in statistics and detailed knowledge of the data collection tools are required. Points in this section should be apportioned according to the quality of the contribution. Sometimes a statistical expert may be used for this purpose; if so, he or she should be assigned the points.

Example: Five points are assigned to D, the statistician, who provided assistance in interpreting the results. Three points are assigned to B and two to A, who are knowledgeable about the research instrument and can best interpret the results in light of that knowledge.

Drafting Manuscripts
Generally, articles require at least two drafts before submission to a journal and then at least a third draft after receiving suggestions from the reviewers and editor. Often each author, after deciding upon an outline, will draft sections of the manuscript. One person frequently will assemble the sections and write the second draft in order to assure continuity, consistency of style, and accurate references. If the article is "accepted with revisions" (the general rule for articles that are accepted for publication), a third draft of the article will be necessary. This final draft may be completed either by the second-draft author or by all of the authors. Points (50 for the first draft, 30 for the second draft, and 2 for redraft of each page in subsequent drafts) should be apportioned on the basis of the amount of writing (number of pages) done by each author.

Example: For the first draft, 30 points are assigned to A, 15 to B, and 5 to C, who prepared the tables. The 30 points for the second draft are assigned to A, who took the others' contributions and produced a complete manuscript.

Editing the Manuscript
Often manuscripts, even after the second draft, need technical editing by someone other than the principal author, who is frequently too close to recognize lapses in logic, grammatical errors, reference style mistakes, and unclear wording. If this step is not performed by the author of the second draft, up to 10 points may be assigned an editor, depending on the quantity of changes required. If the editing is performed by the second-draft author, assign no points because the editing can be incorporated during the redrafting process.

Example: B was assigned six points for editing the manuscript. The full points were not assigned because only a moderate number of technical and grammatical corrections were necessary.
Determining Order of Authors’ Names

The collaborators as a group should assign points in each applicable category. Once consensus has been achieved in assigning points, each participant’s points can be summed. The researcher with the most points is designated senior author and lists his or her name first, the researcher with the next highest total is listed second, and so forth. (In the event of ties, a coin toss can decide the order.) Any contributor who does not amass at least 50 points is viewed as having made an ancillary contribution and is not entitled to be listed as author; his or her contribution should be acknowledged in a footnote or other appropriate place.

Example: A accumulated 142 points, B 79, C 32, and D 13. Consequently, A’s name will be listed first, followed by B. The contributions of C and D will be acknowledged in a footnote.

CONCLUSION

As a means of determining the usefulness of the proposed schema, the author interviewed three colleagues—two faculty members and a student affairs practitioner. Together they applied the procedure to recently published research articles in which either students or subordinate staff members were co-authors with faculty or supervisors. Of the six articles analyzed, the order of authorship would have been unaffected by the analysis of three studies. Two articles would have had a different order of authors—one with the subordinate listed first, the other with the senior professional being listed first. One article would not have listed a third person as an author, because his contribution would have been deemed “ancillary” through application of the proposed schema. All of those interviewed reported that the procedure was helpful in directly addressing the sometimes delicate issues of order and merit of authorship.

The schema presented here is designed to help counselors, student affairs practitioners, faculty members, and other helping professionals who wish to act responsibly and ethically, to make decisions about joint authorship of research publications. The weights assigned to the various categories were established a priori, based on this author’s experience in publishing professional articles. Groups of authors by mutual agreement may wish to adjust point values for categories before beginning the assignment of points to individuals. (The weights for categories are much less important than is the careful, systematic, and unemotional examination of the contributions of all involved.) Professional ethics require that appropriate credit be given to all to whom it is due. This schema provides a framework that can encourage professionals to analyze carefully all of the contributions made to research and writing projects and to act in a professional and ethical manner.

REFERENCES


Roger B. Winston, Jr. is an associate professor in the Department of Counseling and Human Development Services, University of Georgia, Athens. The author is indebted to his colleagues Warren C. Bonney and Theodore K. Miller for reviewing the manuscript and for their helpful suggestions.