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# Graduate Students and the Culture of Authorship

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In the last 50 years, multiauthored publications have become more prevalent, given the increasing number of collaborative, interdisciplinary, multicenter research studies. The determination of authorship credit and order is a difficult process, especially for graduate students, whose disadvantaged power position in research settings increases their vulnerability to exploitation. The American Psychological Association has published ethical standards for determining authorship credit, but the power difference inherent in the student–faculty relationship may complicate this ethical dilemma. The authors reviewed a number of previously recommended strategies and proposed that determining authorship credit is most effectively facilitated through professional development.

Keywords: authorship credit, author, graduate student, ethics

Peer-reviewed publications serve as a record of scholarly activity, the quantity and quality of which inform decisions regarding career advancement, tenure, and funding. For students, such as the writers of this article, authorship can lead to more competitive internships, postdoctoral fellowships, and employment. The misattribution of authorship credit has been widely discussed in the scientific literature, but the problems specific to the power differential between students and faculty have received scant consideration, particularly from a student perspective. There are a few notable examples of student researchers claiming that their intellectual contributions were misappropriated by supervisors and faculty. The more common situation involves students receiving less credit than they expected (e.g.,

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Costa & Gatz, 1992), which can lead to feelings of powerlessness, bitterness, and disenchantment with the scientific process. Determining authorship credit is difficult for established researchers, and the power differential inherent in student–advisor relationships complicates matters and deserves further exploration. The purpose of this contribution is to direct needed attention toward the ethical issues involved in student authorship and provide relevant suggestions for faculty and graduate students.

## AUTHORSHIP CREDIT

Until 1955, most scientific papers were sole authored (Rennie, Yank, & Emanuel, 1997). In the last 50 years, multiauthored publications have become more prevalent, given that many issues are best investigated using a multidisciplinary approach. In addition to the rise in truly collaborative projects, authorship is sought as a form of academic currency, which may lead researchers to maximize authorship credit (Bennett & Taylor, 2003). In a notable example, the *New England Journal of Medicine* published a 10-page article with 972 authors (GUSTO investigators, 1993). Although multiauthored publications have become particularly common in medicine, a growing number of multicenter, interdisciplinary projects have been noted across fields (Biagioli, 1998). The increase in multicenter projects and the rewards of publication have led to two main abuses of authorship: honorary authorship and ghost authorship (Bennett & Taylor, 2003).

## HONORARY AUTHORSHIP

Honorary authorship refers to those individuals receiving authorship credit without substantially contributing to a project (Rennie et al., 1997). A survey of published articles suggested that almost 20% of publications include such authors (Flanagin et al., 1998). Honorary authorship is an ethical transgression because it dilutes the credit for the authors who made legitimate and substantive scientific contributions (Bennett & Taylor, 2003). Graduate students may not often receive honorary authorship, so their legitimate contributions to a manuscript are at risk to be minimized by the inclusion of numerous authors. Authors have given honorary credit to individuals for many reasons, some voluntary and some potentially coercive. Honorary authors may be credited to associate the legitimate authors with a prestigious individual. Other reasons include payment for favors (e.g., for referring participants) and reward. For example, a faculty member may give authorship credit to a graduate student whose duties included mainly administrative or technical tasks in an attempt to further the student's academic endeavors.

On the other hand, senior faculty in positions of authority may become honorary authors as the result of interpersonal pressure, ranging in severity from subtle expectations to outright demands. Informal institutional "policies" may also dictate that certain individuals (e.g., department chairs, owners of laboratory space) be included among the authors even when their direct contributions to the paper are minimal or nonexistent. Although most professionals would agree that writers should not give authorship credit to individuals who have not contributed to the project, this can be difficult, as the social and political pressures to do so can be overwhelming.

In 1981, cardiologist John Darsee was found to have fabricated data throughout his career. Prestigious department chairs were included as honorary authors on Darsee's publications. Although these individuals were eventually cleared of any involvement in the fabrication of data, they will be forever linked to these instances of scientific misconduct (J. Smith, 1994).

## GHOST AUTHORSHIP

Ghost authors are individuals who have made contributions worthy of authorship but are not credited as authors (Flanagin et al., 1998). In a survey of published authors, 11% reported the presence of a ghost author (Flanagin et al., 1998). Withholding credit is unethical because deserving authors go unrecognized for legitimate scientific contributions. Ghost authors are often not revealed in an attempt to hide conflicts of interest or the use of professional editing services (Kempers, 2002). Individuals who have substantially contributed to the project may or may not desire authorship credit. For example, individuals may intentionally remove their names from an author list in an attempt to reduce the perceived impact of negative findings (Bennett & Taylor, 2003). Graduate students, on the other hand, may be more likely to make significant contributions to a manuscript and be denied authorship credit.

In 1989, Carolyn Phinney was a research psychologist at the University of Michigan's Gerontology Institute under the supervision of Marion Perlmutter, PhD. Perlmutter allegedly incorporated Phinney's research into a grant application and accessed Phinney's previous research and grant proposals without permission. Phinney filed suit, and in accordance with a 1993 jury ruling, the University of Michigan awarded Phinney $1.6 million in punitive damages (Zarko, 1996).

## GRADUATE STUDENT AUTHORS

Graduate students represent a special population within the research community. They differ widely in level of experience, familiarity with the research landscape,

and understanding of the formal and informal customs in the culture of authorship. Students may be in fragile psychological positions, as they often undergo relocation, isolation, and distress due to the strain of their graduate education (Schneider, 1987). Issues specific to graduate education receive limited attention in psychology's professional literature, and graduate students are rarely polled about ethical and career-related issues. A 2005 survey of authorship credit in faculty–student publications included only four graduate student responses out of a sample of 604 (Sandler & Russell, 2005). A survey of graduate teaching assistants suggested that many receive little or no training or supervision, and most will engage in some form of unethical behavior (Branstetter & Handelsman, 2000). More than 90% of students and faculty report witnessing unethical behavior, such as failure to maintain confidentiality, by psychology graduate students (Fly, van Bark, Weinman, Kitchener, & Long, 1997).

Graduate students enter relationships of unequal power with faculty advisors and research supervisors, creating the possibility for exploitation (Costa & Gatz, 1992). Training practices in psychology are based on the mentorship model, and students are highly dependent on faculty for mentoring, research and teaching experience, and career advancement (Schneider, 1987). Graduate students often work closely with faculty supervisors in multiple and overlapping relationships, and a power differential exists in each. Given this power differential, students may be reluctant to assert themselves when determining authorship credit out of fear that the other relationships will be affected (Rose & Fischer, 1998).

Students' disadvantaged power position, lack of knowledge, and relative inexperience in the research setting all increase their vulnerability to exploitation. Faculty members, as those in the advantaged power position, are ultimately responsible to prevent student exploitation (Arthur et al., 2004; Goodyear, Crego, & Johnston, 1992; Kolbert, Morgan, & Brendel, 2002). Ethical and professional development lessons learned during graduate school will likely influence one's conduct as a professional. Faculty members must also protect their own due credit as supervisors, and little guidance has been offered to assist in this effort (Arthur et al., 2004).

The field of mental health is particularly concerned with attending to power differences and preventing exploitation (Oberlander & Barnett, 2005). The assignment and order of authorship credit is an ethical concern in the field of psychology, and in a recent survey of members of the American Psychological Association (APA), nearly one third of respondents believed they had been or may have been involved in the unfair or unethical assignment of authorship credit (Sandler & Russell, 2005). In an attempt to prevent harm, the field of psychology has developed an evolving series of ethical codes and licensure standards.

## ETHICS CODES AND REGULATIONS

In the 1951 APA code of ethics, assignment of authorship credit was identified as the most common ethical dilemma in publication. Standard 5.12 read,

> Difficulties often arise in the method of apportioning and indicating credit for work done by co-authors, senior and junior staff members, or by faculty members and students. These problems are complicated by the varying roles and contributions of the participants, which do not always coincide with their ranks. (APA, 1951, p. 444)

Although the terms "senior" and "junior" may serve to reinforce power differentials, the APA did attend to the potential disparities between rank and level of contribution to a manuscript. The ethics code included several vignettes and described many possible collaborative relationships between students and faculty. Subsequent editions of the APA ethical standards have become less specific regarding these issues, stating that authors include only those who have made professional contributions to a paper, authors should be listed in relative order of contribution, and minor contributors should be acknowledged (APA, 1959, 1968, 1992).

The most recent 2002 APA ethical standard regarding publication credit (8.12a) reads, "Psychologists take responsibility and credit, including authorship credit, only for work they have actually performed or to which they have substantially contributed" (APA, 2002, p. 1070). The word *substantially* was added in the 2002 revision to clarify that an intellectual contribution to the publication was required for authorship and to remind authors that they are ultimately responsible for the content of the publication (Fisher, 2003). Standard 8.12b states,

> Principal authorship and other publication credits accurately reflect the relative scientific or professional contributions of the individuals involved, regardless of their relative status. Mere possession of an institutional position, such as department chair, does not justify authorship credit. Minor contributions to the research or to the writing for publications are acknowledged appropriately, such as in footnotes or in an introductory statement. (APA, 2002, p. 1070)

The goal of this standard is to protect those deserving of authorship from exploitation, particularly students, nontenured faculty, researchers, and others in disadvantaged power positions (Fisher, 2003).

The standard regarding student publications was dramatically revised for APA's 2002 ethics code. In 1992, this section (6.23c) read, "A student is usually listed as principal author on any multiple-authored article that is substantially based on the student's dissertation or thesis" (APA, 1992, p. 1609). In the 2002 revision, 8.12c was updated to read,

> Except under exceptional circumstances, a student is listed as principal author on any multiple-authored article that is substantially based on the student's doctoral dissertation. Faculty advisors discuss publication credit with students as early as feasible and throughout the research and publication process as appropriate. (APA, 2002, p. 1070)

The word *thesis* was removed from the standard due to concern about the level of contribution implied by the term (Fisher, 2003). Although the typical apprentice–mentor model includes undergraduate and master's level theses requiring significant faculty assistance, this standard does not prevent students making primary contributions on theses projects from being the first author on resulting publications (Fisher, 2003).

Although some guidance is provided regarding authorship credit, much of the terminology included in the code (e.g., "usually," "substantially") remains open to interpretation. Since the 2002 revision, perceived incidents of unethical or unfair authorship assignment continue to be reported at high rates (e.g., Sandler & Russell, 2005). The increased specificity of the 2002 code will likely reduce instances of students receiving less authorship than deserved on dissertations. However, it does not address the difficulties that may arise when determining authorship credit on other research projects (Arthur et al., 2004).

With significantly more authors per paper in medical journals than counseling and psychology journals (Holaday & Yost, 1994), the field of medicine has led the effort to control the abuse of authorship. The International Committee of Medical Journal Editors (ICMJE) has recommended the following authorship criteria: (a) substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; (b) drafting the article or revising it critically for important intellectual content; and (c) final approval of the version to be published. Authors should meet conditions a, b, and c (ICMJE, 2004). The ICMJE also implores authors to list all other contributors in an acknowledgments section (e.g., technicians, writing assistants, the department chair, and financial and material supporters; ICMJE, 2004).

Despite these recommendations, variability continues to exist in the authorship practices across medical journals (Bates, Anić, Marušić, & Marušić, 2004). For example, *British Medical Journal* editors require authors to describe contributions in their own words. Authors submitting manuscripts to the *Annals of Internal Medicine* must identify their contributions from among a list of possible contributions. Editors of the *Journal of the American Medical Association* require authors to complete a structured checklist indicating which contributions meet ICMJE criteria.

Bates et al. (2004) proposed 11 categories of contribution involved in authorship: (a) conception and design of the study; (b) analysis and interpretation of data; (c) collection or assembly of data; (d) statistical expertise; (e) provision of study

material or patients; (f) drafting of the article or part of the article; (g) critical revision of the article for important intellectual content; (h) obtaining funding; (i) administrative, technical, or logistic support; (j) guarantor of the study; and (k) study supervision or coordination. Categories a through e combine to address the first ICMJE criterion and categories f and g meet ICMJE's second criterion. The third criterion would be met on approval of the final manuscript.

## PROPOSED SOLUTIONS

Given the subjective nature of authorship and the inevitable power differentials between authors, several solutions have been proposed to illuminate the difficult process of assigning credit.

### Use of Scoring Strategies in Determining Authorship

Winston (1985) proposed a scoring system for assigning authorship credits. Twelve tasks are awarded point values ranging from 2 (redraft of a page) to 50 (conceptualizing and refining research ideas). Points are totaled for each individual involved in the project. All individuals with 50 or more points are declared authors (and listed in descending point order), and all individuals with less than 50 points are listed in the acknowledgments section. Even though scoring procedures have been in existence for nearly 20 years, they have not been widely implemented, and psychologists continue to identify the assignment of authorship credit as an ethical dilemma (Pope & Vetter, 1992).

Point systems have the advantage of adding objectivity to the art of ethical decision making, but may not allow the flexibility needed to adapt to each project. For example, although data analysis and interpretation may be relatively simple in a correlational, cross-sectional design, they may require extensive time and expertise in a data-driven, exploratory, longitudinal study. Winston (1985) argued that a numerical approach can be made flexible by means such as weighting points by professional competence. Adding flexibility through weighting, as agreed on by a research team, may improve the objectivity of authorship assignment. These points may need to be revisited for every research project. It is important to be mindful of the inherent power differences between members of a research team while establishing and negotiating a point system.

### Specification of Author Contributions

An often-cited method to prevent authorship abuse is to specify research contributions in footnotes (Rennie et al., 1997). This system specifies the allocation of duties, which allows readers to contact specific contributors with relevant questions.

Another suggestion is to list credits (e.g., writer, statistician) for each contributor (R. Smith, 1997). This system would increase flexibility because individuals can be included as contributors who may not qualify as "authors" in the traditional sense (Kempers, 2002). One radical proposal is to forgo traditional authorship completely and list the institution as an author and include a footnote with the researchers names (Fortney, 1998).

These suggestions would allow for more contributors to be listed with each work, but critics argue that limited journal space precludes extensive listings of contributions and committees. The credits may also be uninteresting (e.g., wrote third draft) and vague (e.g., developed content), making it more difficult for the reader to discern which individuals deserve credit for each manuscript (Greenfield, 1998). Footnotes would vary across manuscripts, given that various sections of a manuscript require different amounts of time and effort on different projects (Gunsalus & Tessman, 1997). These recommendations may also limit what readers believe an individual contributed to the project, and contributors may be less likely to take responsibility for the findings (DeBakey & DeBakey, 1995). It seems unlikely that professionals are going to limit authorship to one guarantor and be content with listed contributions, given that footnotes, acknowledgments, and introductory sentences are not listed on one's curriculum vitae. Ultimately, these specification systems may only encourage authors to be creative when describing their contributions (DeBakey & DeBakey, 1995).

### Increased Editor Responsibilities

Editors have also taken on increased responsibility to reduce authorship abuses. Several journals require authors to sign a declaration stating that they are responsible for the content within the article (Edwards & Babor, 2000). Journal editors cannot police author contributions to each submitted manuscript or settle disputes, and they are forced to ask researchers to report on themselves (Biagioli, 1998; Louw & Fouche, 1999). These signed declarations serve as a concrete record that cannot be refuted after publication (Rennie et al., 1997), but authors may perceive few potential ramifications from untruthfully signing this declaration.

Other suggestions have been made to include all authors in alphabetical order. Although various journals have implemented this suggestion, it is not surprising that individuals with last names in the latter half of the alphabet tend not to submit manuscripts to these journals (Rennie et al., 1997). Finally, it has been proposed that journals accept only a certain number of authors. This may discourage honorary authorship, but it would also punish collaborations and multisite trials (Erlen, Siminoff, Sereika, & Sutton, 1997).

### Increased Professional Organization Responsibilities

Professional organizations have been identified as a possible source for improvement in the authorship system, and professional associations should certainly ad-

dress the assignment of authorship credit and make their expectations clear (Edwards & Babor, 2000). Although ethical guidelines will probably never be precise and specific enough to prevent all transgressions (Holaday & Yost, 1995), governing bodies should continue to attempt to improve the current system, just as laws remain in place even though they cannot prevent all crimes (Rennie, 2001).

### Schoolwide Regulations

Universities, rather than professional organizations, can create regulations regarding authorship credit. Few colleges and universities use such regulations (Louw & Fouche, 1999). Although this may help standardize authorship credit assignment within schools, there would likely be variability between schools. In addition, it is unclear whether different professions within one university should be operating under the same set of authorship guidelines. On the other hand, university regulations and policies are widely distributed and easily accessible. Regulations regarding the ethical assignment of authorship credit should be included in faculty handbooks and student orientation manuals (Arthur et al., 2004).

### Changes to the Vitae Review Process

Slone (1996) advocated revising the vitae review process by limiting the number of publications submitted for review. For example, applicants would submit no more than 10 publications for review, forcing them to weigh quality, quantity, and authorship credit. This reduces the incentive for researchers seeking authorship credit for minimal contributions. Another suggestion is to encourage potential employers to use a standardized scoring system for each publication (Hemenway, 1998). This system would grant equal credit to all secondary authors and twice that amount to the first author. Although this may help reduce the number of authors per paper, this is not an optimal solution for disciplines hoping to encourage interdisciplinary collaborations and multisite trials.

### Professional Development

All of the solutions described may facilitate the process of assigning authorship credit or reduce the number of authors on any given publication. Although various authorship guidelines have already been implemented and are widely distributed and understood, they are seldom followed (Bennett & Taylor, 2003; Biagioli, 1998, Rennie et al., 1997). These suggestions fail to address the inherent power disparity between students and faculty that creates opportunities for exploitation (Fine & Kurdek, 1993; Kolbert et al., 2002). Shadish (1994, p. 1096) argued that "only a small percentage of students quarrel with not being principal author on resulting publications, at least as long as authorship issues are discussed openly at the start," yet he did not acknowledge that students are forever linked profession-

ally to advisors and may be fearful of real or imagined consequences of questioning authorship practices. As students, many individuals are grateful for *any* level of authorship on a publication. Although students likely have the problem solving ability to decide authorship credit (Fine & Kurdek, 1993), this power differential can lead students to be reluctant to address authorship credit issues in fear of possible damage to the relationship or retribution (Murray, 2002).

One rarely suggested possibility for reforming the authorship assignment system is building students' professional development skills. Surveys of students suggest that they overestimate supervisor authorship credit and underestimate student credit compared to their own supervisors' estimates, indicating that education of students and future scientists is needed (Costa & Gatz, 1992; Edwards & Babor, 2000).

Students' professional competence can be viewed as being on a continuum. Most students enter graduate programs with limited experience in research and publishing, and few are sophisticated in the culture of authorship assignment. Mentors should be invested in providing students with a learning experience and guiding students toward independence, regardless of their competence (Barres, 2002; Kee, 1994). Students may underestimate the importance of mentorship in the process of identifying meaningful research questions, collecting data, writing the paper in a professional style, responding to reviewer's comments, and other tasks associated with manuscript preparation and publication. Students are transitory, and may move on or lose interest in projects after fulfilling degree requirements, whereas professors are more invested both personally and professionally in what is often an ongoing program of research.

Ultimately, each individual has his or her own philosophy about authorship credit. Supervisors should evaluate their own position and situational factors (e.g., would I change the author list if I were not under tenure review this year?) that lead them to make decisions regarding authorship. Supervisors should explicitly inform students about their philosophy and attitudes toward authorship credit, given that the traditional apprentice model of learning informally from faculty does not seem to be adequate to prevent ethical transgressions (Folse, 1991). Both parties should discuss abilities, tasks, supervision required, and appropriate expectations to decide what contributions merit authorship. This discussion is similar to obtaining informed consent, and signed agreements may be helpful (Fine & Kurdek, 1993). In addition to simply deciding between author and nonauthor, supervisors should openly discuss and negotiate the order or authors. Although there is some consistency in the contributions of first authors, great variability exists in the contributions of middle authors (Shapiro, Wenger, & Shapiro, 1994).

Previous research in the area of authorship credit has been largely based on surveys including short vignettes. Although vignettes can be helpful as a teaching tool and encourage thought about the difficulties involved in the assignment of authorship, they have limited utility when exploring the complexities of collaborative re-

search projects. Short examples do not allow the reader to understand the varying amounts of effort and expertise involved in given tasks. For example, a vignette reporting "Student A collects the data for the study, and Supervisor X writes the manuscript" do not express how much work each task entailed (e.g., Was data collection completed in one day or three years? Is the manuscript a brief report or a book?). Lengthier vignettes may be useful when exploring these issues in future research. Other research has surveyed authors and students to assess which duties are perceived as important for authorship credit and how many published documents have incorrectly credited authors. Low response rates raise questions about the representative nature of respondents, and any self-report responses are subject to bias.

Reviewing the previous suggestions to prevent the misappropriation of authorship credit, we offer the following recommendations.

## Recommendations

- *Look to guidelines from professional organizations and journals.* Existing standards provide basic guidance and structure for resolving authorship disputes. Those professions without authorship guidelines should critically examine the process of assigning credit within their disciplines and look to existing guidelines from other organizations. Unfortunately, no one set of guidelines, however specific, will be able to address all of the factors involved in the assignment of authorship credit.
- *Mentors should understand and explore their own professional development beliefs and convey these to students.* Consider whether authorship decisions should be based on contributors' relative contributions or status, such as paid staff, volunteers, undergraduates, or graduate students. A recent survey of students and faculty revealed that each group is most concerned about their own exploitation with regard to the assignment and order of authorship credit (Kolbert et al., 2002). An open discussion may lead both groups to be more sensitive to the other's views and concerns.
- *Discuss authorship early and often.* Supervisors should engage individuals in a dialogue about authorship before projects get started and before individuals have vested interests (Erlen et al., 1997). Research teams are encouraged to openly debate these issues and come to a consensus about what contributions merit authorship. Authorship credit outlined on a manuscript proposal form should be flexible and negotiable. These discussions need to take place within the entire research team, not just between each faculty member–student dyad. For example, Arthur et al. (2004) described a working group formed within a multisite project team to define and negotiate intellectual ownership.
- *Clarify roles.* The use of a written document is encouraged (e.g., Hopko, Hopko, & Morris, 1999). This document prospectively identifies a first author,

coauthors, and their respective roles at the start of a project. A manuscript proposal form also outlines the objectives of the study, leading to less overlap in projects and fewer disagreements. This document should be revisited throughout the publication process, with attention to the power differentials present (Arthur et al., 2004).

- *Authorship should be based on relative contribution.* Giving honorary authorship to students may falsely represent their scholarly expertise, provide them with an unfair professional advantage, or raise expectations of others in the future (Fine & Kurdek, 1993). On the other hand, both students and faculty can make minor contributions to projects that do not warrant authorship (Crespi, 1994). Students should generally be first authors on dissertations, but it is difficult to make concrete rules about theses and dissertations because each may vary in level of student and supervisor involvement. First authorship should be granted to the individual who has contributed most substantially to a project, and subsequent authors should be listed in order of descending contribution.
- *Use acknowledgments appropriately.* Unfortunately, acknowledgments have little value for promotion and tenure. Individuals contributing to your project as nonauthors should still be acknowledged. Examples of tasks worthy of acknowledgment include obtaining funding, referral of funding, collecting or providing data, writing assistance, or general supervision (Hare, 2001). Authors should obtain permission from those whose contributions they wish to formally acknowledge in a publication.
- *Give students time and flexibility to be innovative and creative* (Lawrence, 2002). The goal of mentorship is to help individuals develop their professional competence, and students should be allowed to initiate projects with an appropriate degree of supervision. Mentors should find a balance between allowing students to take initiative with research opportunities and identifying realistic, achievable endeavors appropriate to students' level of training and expertise.
- *Motivate students to pursue publication.* Faculty should encourage students to publish meaningful research findings. Situations may arise where students lack apparent motivation or incentive to publish findings from completed projects, and in such cases, explicit timelines should be used. If supervisors feel compelled to publish the findings, this should take place after the student has been given a final opportunity to pursue publication. Supervisors should take first authorship only if the manuscript needs extensive rewriting or further analyses before submission.
- *Clearly outline the appropriate course of action for any individual with questions or concerns about authorship assignment.* Students and faculty should discuss options for resolving complaints. For example, discuss issues with other authors, the principal investigator, the department chair, the dean, a third-party arbitrator, or an ethics committee. Those in the advantaged power position must be aware of this as disputes are managed (Arthur et al., 2004; Goodyear et al., 1992; Kolbert et al., 2002).

- *Attend to the power differential between students and faculty.* Students are often dependent on advisors for research experience, theses and dissertations, course grades, and letters of recommendation. Students may be unlikely to complain about perceived injustices for fear that it will have a negative effect on multiple relationships with supervisors. Supervisors should work to reduce the power differential by creating a forum for discussion, and should consult frequently with impartial colleagues.

## CONCLUSIONS

Contributors take numerous complex factors into account when assigning authorship credit (Bartle, Fink, & Hayes, 2000). Actually writing the paper and conceiving the idea were the most important perceived contributions of surveyed authors from the *Journal of Consulting and Clinical Psychology* (Wagner, Dodds, & Bundy, 1994). However, there was wide variability for most remaining categories, particularly for data collection and data analysis–interpretation, underscoring the disparity of authorship credit within each project. In 2000, psychology faculty and students were surveyed using vignettes similar to those employed by Spiegel and Keith-Spiegel (1970). Results suggest that faculty members are more likely to report that students deserve authorship credit (both author vs. nonauthor and first vs. other) than they were 30 years ago (Bartle et al., 2000). However, the current culture of scientific reward, which is based on number of publications, journal impact factor, and rank of authorship, may encourage faculty to usurp authorship credit from those in disadvantaged power positions (Lawrence, 2002). Abolishing the authorship system or assigning credit based on a complex scoring strategy may curb some authorship abuses. However, even these strategies are subjective and therefore open to interpretation and error. It is unclear when, if ever, authors will create and adopt a generalizable set of principles to determine authorship credit and order.

Education of future scientists may be the optimal strategy to discourage inappropriate assignment of authorship credit that may exploit both faculty and students. Unfortunately, there is a relative lack of training regarding ethical issues that are related to professional advancement in current graduate school curricula. It is imperative that ethics courses address the power disparities that exist between students and faculty, as well as authorship credit negotiation strategies. These courses should be offered as early in graduate training as possible, before students have spent months or years as a research assistant and advisee (Oberlander & Barnett, 2005). However, courses in ethics are insufficient to address all topics psychologists are likely to face throughout their careers, and these concerns should be addressed in other courses and mentoring situations (Sell, Gottlieb, & Schoenfeld, 1986). Supervisors should collaborate with students to examine the difficulties in-

volved in the assignment of authorship credit and continue to develop and test strategies that promote positive research experiences and the advancement of science.

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