
SPECIAL TOPICS

Advancing Kinesiology Through Improved Peer Review

Duane V. Knudson
Texas State University

James R. Morrow Jr. and Jerry R. Thomas
University of North Texas

Peer review of scholarship is essential to journal quality, evidence, knowledge advancement, and application of that knowledge in any field. This commentary summarizes recent literature on issues related to peer-review quality and current review practice in kinesiology and provides recommendations to improve peer review in kinesiology journals. We reviewed the literature on the characteristics of peer review in scientific journals and describe the status of peer review in kinesiology journals. Although the majority of scholars and editors strongly support the peer-review process, systematic research in several disciplines has shown somewhat positive but mixed results for the efficacy of peer review in evaluating the quality of and improving research reports. Past recommendations for improvement have focused on agreement between reviewers, standards for evaluating quality, and clarification of the editorial team roles. Research on interventions, however, indicates that improving reviewer performance is difficult. The specific research on peer review in kinesiology is limited. Six recommendations to improve peer review are proposed: publishing clear evaluation standards, establishing collaborative evaluation procedures and editorial team roles, utilizing online submission data to help improve reviewer comments, creating author appeals procedures, protecting reviewer time commitments, and improving reviewer recognition. There is considerable variation in peer-review criteria and procedures in kinesiology, and implementing several reasonable improvements may advance knowledge development and the field of kinesiology.

Keywords: publication, referee, research, scholarship

Advancing the body of knowledge and application of knowledge in science depends on high-quality research. Peer review is traditionally employed for the initial judgment of the scientific integrity and quality of research reports. Recent efforts to systematize the integration and interpretation of the evidence from research through evidence-based practice (Amonette, English, & Ottenbacher, 2010; Faulkner, Taylor, Ferrence, Munro, & Selby, 2006) and reporting standards for research (Hirst & Altman, 2012) have likely increased the burden on editors and reviewers

conducting the peer review of research reports (Knudson, Elliott, & Ackland, 2012).

Manuscript reviewers provide essential services to any disciplines and professions related to the journal. Traditionally, reviewers are tasked with evaluating two main criteria on articles: (a) quality and (b) the relevance or contribution that advances the field. Reviews are also expected to contribute by improving the report through constructive advice and feedback. Although differences exist in what is considered quality or scientific standards, as well as in what constitutes a contribution advancing the field, peer review is a vitally important part of quality control of the evidence and the development of theory/knowledge in a discipline

Correspondence should be addressed to Duane V. Knudson, Department of Health and Human Performance, Texas State University, 601 University Drive, San Marcos, TX 78666. E-mail: dknudson@txstate.edu

(Baker, 2002; Hojat, Gonnella, & Caelleigh, 2003). Reviewer expertise/quality is also considered important to journal quality (Callahan, Baxt, Waeckerle, & Wears, 1998). Although quality reviews cannot ensure that high-quality papers are submitted to a journal, they can decrease the probability that erroneous designs, analyses, or interpretations are published.

This commentary aims to summarize recent literature on issues related to peer-review quality and current review practices in kinesiology, and makes recommendations to improve peer review in kinesiology journals. Although there has been considerable research on peer review in many disciplines, little research on peer-review practices exists in kinesiology, with only one paper reviewing practices in exercise and sport psychology journals (Holt & Spence, 2012) and another examining reviewer reliability (Morrow, Bray, Fulton, & Thomas, 1992). It is possible that the diverse, interdisciplinary structure of kinesiology has not been conducive to unified interest in the nature and quality of peer review across journals. We hope this commentary stimulates discussion and implementation of some of these recommendations to support reviewers and the peer-review process in kinesiology. We believe improvements in peer review will result in subsequent improvement in the research and theory developed in kinesiology.

RECENT CRITIQUES OF PEER REVIEW

New forms of academic publishing such as open-access journals have reinvigorated the longstanding debate about the system of peer review in scholarly journals. Various forms of more open reviewing have been proposed from not blinding reviewers and authors to publication of reviewer identity and posteriori reviewer and reader commentary. Several reviews have documented the long history of controversy surrounding peer review of scholarly articles in many disciplines (Armstrong, 1997; Benos et al., 2007; Burham, 1990; Campanario, 1998; Hardie, 2010; Hojat et al., 2003; Holt & Spence, 2012; Lee, Sugimoto, Zhang, & Cronin, 2013).

Concerns About Peer Review

Critics of peer review question the logic of the binary accept/unacceptable peer-review decision, when the quality or contribution of research is clearly more subtle, and the imprecision of its definition (Jefferson, Wager, & Davidoff, 2002; Lamont, 2009; Smith, 2006; Souder, 2011; Wheeler, 2011). High-influence journals see numerous submissions, so it is likely that some papers have “fatal” errors or flaws. A fatal flaw is a major design error (e.g., lack of control of confounding variables, uncalibrated or incorrectly used equipment) that compromises the internal validity of the study. Critics also identify the rare cases of editorial decision errors, where weak papers with clear problems are published

and papers with no fatal flaws or major weaknesses have been rejected. For example, Smith (2006) has questioned the high cost of time and money of peer review for the purported benefit of eliminating papers with errors, sloppy design, or inaccurate interpretation.

Perhaps the strongest criticisms are based on systematic research on peer review, which has documented problems including several kinds of bias and poor reliability. Although most of the studies of intrareviewer and interreviewer reliability report generally low-to-moderate reliability (see reviews by Hardie, 2010; Hojat et al., 2003; Horrobin, 2001; Lee et al., 2013; Miller, 2006; Smith, 2006), several studies report embarrassingly poor consistency between reviewers. For example, Rothwell and Martyn (2000) reported overall reviewer agreement not much better than chance in two neuroscience journals. Morrow et al. (1992) reported that interrater reliability of reviews in the *Research Quarterly for Exercise and Sport* were somewhat lower than in other disciplines.

Should we always expect strong agreement among reviewers? Editors often send papers to reviewers for very different reasons. Some papers are quite complex and a reviewer may know more about one theory or methodology than another. For example, we sometimes see papers using mixed methodology—both quantitative and qualitative methods. Reviewers may be much more familiar with one methodology than the other, which could contribute to inconsistent evaluations. A reviewer may be selected for statistical expertise but have limited knowledge about the discipline and hypotheses being tested. In a recent review, Lee et al. (2013) contended that some reviewer disagreement should be expected due to the social nature of the process. When reviewers have directly opposing evaluations of a manuscript, the role of the editor or associate editor in summarizing comments, seeking additional review, or resolving conflict is essential.

Some consider peer review so inconsistent and costly that they have proposed extensive reform efforts to open up the review and scholarly publication process (e.g., Hartley, 2012; Kaplan, 2005). Open peer-review systems typically feature disclosure of both authors and reviewers, and they publish both and sometimes collect discussion about both the paper and the reviews. These open procedures have several problems. First, these procedures run higher risks for theft of intellectual property. Second, there is a higher risk for publication and application of erroneous results. The negative effects of this are magnified as most scientific fields are notoriously slow in their role of collective self-correction of erroneous reports and theories. We have found scholars rarely challenge weak or erroneous studies through letters to editors or replication in journals. The occasional letter to the editor is quite rare given the thousands of papers published with flaws in reviews of literature, design, statistics, citation, and data interpretation. For example, despite decades of research documenting the inflation of Type I statistical errors testing numerous dependent

variables (Knudson, 2007, 2009; Lundbrook, 1998; Morrow & Frankiewicz, 1979; Zhu, 2012), a large percentage of papers continue to be published in kinesiology journals with these errors (James & Bates, 1997; Knudson, 2005, 2009; Mullineaux, Bartlett, & Bennett, 2001). Third, there is no research on the hypothesized positive effects of these open publication proposals (Lee et al., 2013).

Supporters of Peer Review

Proponents of the importance of peer review point to anecdotal evidence of improved manuscripts and the rejection of manuscripts with serious errors submitted to journals they serve. Journal article rejection rates are quite consistent over time within particular disciplines (Hargens, 1988) even though there are changes in editors and editorial board members. Some research on peer review has shown little evidence of bias and acceptable agreement between reviewers (Morrow et al., 1992; Vecchio, 2006). A Cochrane report (Jefferson, Rudin, Brodney Fose, & Davidoff, 2008) on peer review in biomedical journals concluded that there were a few studies reporting peer reviews that were generally valid and that improved the readability and reporting of evidence in the papers, but the limited number of these studies meant they had little generalizability. Valid reviews are unbiased judgments using the evaluation criteria of the journal.

Although there is tentative supporting evidence of the effectiveness of traditional peer review, there is generally widespread approval of the system. A large-scale international survey of scholars reported 85% approval of the peer-review process for improving research (Ware & Monkman, 2008). Most medical editors consider traditional peer review to be the best method available (Alpert, 2007; Hardie, 2010; Smith, 2006). In addition, most cases of retention, tenure, and promotion reviews in universities would be complicated without relying on peer review for an initial level of evaluation of faculty scholarship.

Based on evidence and opinion, double-blind (masking author and reviewer identities) peer review is likely the best system for scholarly journals. Bornmann and Mungra (2011) evaluated the research on improving peer review and concluded that blinding, especially double blinding, reduces the chances of review bias and improves objectivity. It is likely that double-blind reviews provide protection from bias, even though it cannot ensure reviewers will not know the likely authors. In medicine, for example, there is evidence of potential editorial favoritism, so double-blind review has been recommended (Luty, Arokiadass, Easow, & Anapreddy, 2009). Holt and Spence (2012) recommended that, although research on the effectiveness of blinding in reviews was inconclusive, more research be conducted before editors of sport and exercise psychology journals abandon double-blind peer review. Indirect support for traditional double-blind peer review also comes from the

lack of research on the effectiveness of any of the open peer-review alternatives (Lee et al., 2013).

Despite inconsistent support for the high ideals of accuracy and reliability of peer review in journals, most scholars and editors support the peer-review process and some have published recommendations to improve this important process. The following sections summarize recent suggestions to improve the peer-review process.

RECENT SUGGESTIONS FOR IMPROVEMENT

Several recent narrative reviews have proposed recommendations to improve peer review (e.g., Hojat et al., 2003; Holt & Spence, 2012; Kaplan, 2005; Schwartz & Zamboanga, 2009; Souder, 2011; Wheeler, 2011). The primary issues these recommendations address are improving agreement among reviewers, standards for evaluating quality, and clarifying the editorial team roles.

The field of medicine, perhaps, has seen the most research on peer review and journal/editor efforts addressing these issues. Concerns about peer review by medical editors resulted in the establishment of international conferences on the topic in 1998, with the Seventh International Congress on Peer Review and Biomedical Publication being held in Chicago in 2013. Good practical advice for editors and reviewers resulting from these collaborations includes the Committee on Publication Ethics (COPE), its code of conduct (COPE, 2011), and Hames's (2007) book on peer review.

Systematic evaluations of medical reviewer quality generally show relatively uniform quality ratings, usually with small but not meaningful declines in mean ratings of reviewers from 4 to 14 years (Callaham & McCulloch, 2011; Houry, Green, & Callaham, 2012). Interestingly, studies of systematic programs of short-term training (Callaham, Knopp, & Gallagher, 2002; Callaham & Schriger, 2002; Schroter et al., 2004) and longer-term mentoring (Houry et al., 2012) report little effect on quality of peer reviews. These results indicate that review quality is heavily dependent on the reviewer and is difficult to substantially improve. Strong reviews require that scholars remain up-to-date, that they recognize and put aside personal biases, and that they invest considerable time (2–6 hr) to evaluate and provide constructive feedback to authors (Black, van Rooyen, Godless, Smith, & Evans, 1998; Holt & Spence, 2012). Although more research is needed in this area, journals should still make all reasonable efforts to improve the quality of peer review.

PEER-REVIEW PRACTICE IN KINESIOLOGY

The founding of physical education/kinesiology journals in the United States gradually adopted the peer-reviewed

model of journals established in 17th-century Europe (Park, 1980). To document current peer-review practice in kinesiology, the authors reviewed the peer-review procedures of 18 kinesiology journals (Table 1). Several peer-review trends were consistent with journals in other scholarly disciplines.

The kinesiology journals examined used both author-blinded (28%) and double-blind (72%) peer review. Reviewers were queried on up to 11 specific evaluation criteria. There is considerable variation in these categories and how they are rated, from yes/no responses to 10-point Likert-type rating scales. Similar variation across theory to practice criteria was reported by Holt and Spence (2012) in four sport and exercise psychology journals.

All journals requested blinded comments and editorial recommendations to the editor, along with comments to the author. Most journals use electronic submission systems and encourage reviewers to provide specific and constructive comments in open boxes or attached electronic files. Rarely are manuscript-specific (line number-identified) details explicitly required of reviewers in their specific comments to the editors and authors. During many years of experience, we have anecdotally observed many times when reviewers, in correspondence with journals, have not taken time to provide specific feedback and comments in reviews.

This small review of kinesiology journals indicated there is wide variation in the criteria and guidance provided to reviewers in their roles in evaluating the quality/contribution of and in improving papers submitted to kinesiology journals. There is also considerable variation in the communication of submission expectations and evaluative criteria. These data are consistent with a 5-year study of the reliability of reviews in the *Research Quarterly*

for Exercise and Sport. Morrow et al. (1992) reported that three measures of reviewer reliability were lower (generally less than 50% agreement) than the moderate reliability observed in other disciplines. Although variation in reviewer expectations could be expected given the variation in the subdisciplines in kinesiology, there is room for improvement in communicating submission expectations and the criteria used in peer review in many kinesiology journals. The next section of this article outlines some recommendations to improve the traditional peer-review process that could be easily implemented in kinesiology journals.

RECOMMENDATIONS FOR KINESIOLOGY JOURNALS

Editors of the major multidisciplinary and single sub-disciplinary kinesiology journals wield considerable authority to establish appropriate peer-review procedures and standards. They are the “gatekeepers” for the journal and field and should work with their editorial boards and sponsoring organizations to monitor and improve the peer-review process. Six recommendations are proposed for editors to consider with their editorial teams for improving peer reviews and subsequently the articles, evidence, and knowledge generated in kinesiology (Table 2). We acknowledge that these recommendations are based primarily on logic and expert opinion rather than experimental evidence. There is limited prospective evidence comparing typical review procedures to systematic improvement programs (Callaham et al., 2002; Callaham & Schriger, 2002; Houry et al., 2012; Schroter et al., 2004).

TABLE 1
Peer-Review Procedures in Kinesiology Journals

Journal	Blinding	Criteria ^a	Decision Categories
<i>British Journal of Sports Medicine</i>	Author	3 (e.g., ethics in research and publication)	4
<i>European Journal of Sport Science</i>	Double	6 (e.g., impact, originality, rank)	4
<i>Journal of Applied Biomechanics</i>	Author	9 (e.g., clear question, new insights)	5
<i>Journal of Athletic Training</i>	Double	4 (e.g., relevance, presentation)	8
<i>Journal of Motor Behavior</i>	Double	6 (e.g., varying levels of analysis)	4
<i>Journal of Orthopaedic and Sports Physical Therapy</i>	Double	5 (e.g., importance or interest)	6
<i>Journal of Physical Activity and Health</i>	Double	4 (e.g., study design and interpretation)	3
<i>Journal of Sport and Exercise Psychology</i>	Double	4 (e.g., methodological adequacy)	4
<i>Journal of Sports Sciences</i>	Double	3 (e.g., quality of data and methods)	5
<i>Journal of Strength and Conditioning Research</i>	Double	4 (e.g., practical applications impact)	6
<i>Journal of Teaching in Physical Education</i>	Double	10 (e.g., sound theory, new insights)	5
<i>Measurement in Physical Education and Exercise Science</i>	Double	Not provided	4
<i>Medicine and Science in Sports and Exercise</i>	Author	7 (e.g., overall percentile rank)	4
<i>Perceptual and Motor Skills</i>	Author	4 (e.g., sound design, analysis)	4
<i>Pediatric Exercise Science</i>	Double	11 (e.g., relevance, originality)	4
<i>Quest</i>	Double	5 (e.g., theoretical and practice-based)	4
<i>Research Quarterly for Exercise and Sport</i>	Double	4 (e.g., impact to whole field)	4
<i>Sports Biomechanics</i>	Author	10 (e.g., writing and organization)	5

^aThese data were gathered and verified by contacting journal editors. Due to space limitations, only example evaluation criteria for each journal are listed.

TABLE 2
Six Recommendations to Improve the Quality of Reviews in Kinesiology Journals

<p>Publish Clear Evaluation Standards</p> <ul style="list-style-type: none"> • Author instructions and explicit review criteria used for submissions (e.g., authors should know if the manuscript will be evaluated on criteria such as originality of the work, importance to theory or application, or scientific impact). • Standards or descriptions about judgments regarding relevance, merit, or importance to the field in reviews. • Submission guidelines/checklists for electronic submissions. <p>Establish Collaborative Evaluation Procedures and Roles</p> <ul style="list-style-type: none"> • Publish who on the editorial team evaluates manuscripts for suitability if the journal uses pre-review to reject papers (e.g., based on alignment with journal mission, perceived impact of research, or if certain rankings [top 25] are expected for entry into full review). • Clearly identify roles among editor, associate editors, and reviewers. • Foster culture of expert content reviewers with a committed, constructive, respectful evaluation of manuscripts. • Where relevant, provide potential reviewers with information on why they have been invited to review specific submissions. <p>Use Online Manuscript Data to Help Reviewers Improve</p> <ul style="list-style-type: none"> • Provide reviewers with feedback on editorial evaluations of their reviews and other blinded reviews of manuscripts they evaluate. • Provide reviewers with opportunities for training, including face-to-face training at professional conferences (e.g., SHAPE America reviewer workshop). <p>Establish a Procedure for Author Appeals</p> <ul style="list-style-type: none"> • Define criteria for unusual cases where reviews disagree or a poor-quality review may be appealed to the editor by an author. • Possibly establish ombudsperson to handle author appeals. <p>Protect Time Commitment of Editors and Reviewers</p> <ul style="list-style-type: none"> • Track frequency of requests for reviews and limit rounds of reviews for specific submissions. • Establish recommended timelines for reviews. <p>Improve Reviewer Recognition</p> <ul style="list-style-type: none"> • Use recognition programs for reviewers beyond traditional letters, journal access, and listing annually in the journal (e.g., conference events with financial or other awards for quality reviews). 	<hr/> <p>Similar recommendations based on a review of editorials and “limited” studies have been proposed for sport and exercise psychology journals (Holt & Spence, 2012).</p> <p>Publish Clear Evaluation Standards</p> <p>Peer review of research is a subjective task, but the validity and reliability of these evaluations will be better if journals are clear regarding the review standards or criteria for articles submitted for publication (Holt & Spence, 2012). Editors should publish clear statements identifying the criteria used to evaluate the quality of manuscripts submitted to the journal. This is more than the typical sentence or two on the mission, kinds of articles considered, and general comments on peer-review evaluation for the journal. Although this seems logical, surprisingly few journals report the detailed criteria used in their peer review in the purpose of the journal or in author instructions.</p> <p>The journal should regularly publish in the author instructions what constitutes expected characteristics, and consequently the review criteria, for evaluating the quality of manuscripts submitted to the journal. Authors should know specific criteria that are used to judge quality and alignment with the journal’s overall mission. For example, the <i>Journal of Sports Sciences</i> has reviewers rate the impact of the article, originality of the article and the quality of the data and methods for submitted manuscripts. <i>Medicine and Science in Sports & Exercise</i> has these same criteria, includes an overall ranking, and a specific question if additional statistical review of the paper is necessary.</p>
---	--

Research Quarterly for Exercise and Sport instructs reviewers to consider six major issues but uses four other criteria to be rated (quality, impact, writing, impact to the whole field of kinesiology) as the top 10%, 25%, or 50%, or the bottom 50%. Prior knowledge of specific evaluation criteria will prevent misunderstandings and encourage authors to prepare higher-quality reports aligned with the mission and expectations of the journal.

Ultimately, the quality of individual papers published will be evaluated by the field in awards, citations to the work, replications, and extensions of that research. Peer review should not be considered a scientific guarantee or approval of the results and conclusions of the study, but it should be clear what journal standards were used to evaluate the relevance and quality of the research. Scholars should continue to critically evaluate each submission based on the merits of the research report and not the perceived quality of peer review of the particular journal.

A prerequisite to or sometimes part of the evaluation standards is a subjective judgment on the issue of paper suitability, relevance, merit, or importance to the field. This is an area that may be most subjective and resistant to clear operational definitions in evaluation standards; however, the description of the journal and author instructions should be very clear on this matter. One example of where journal missions should be clear is if there is an expectation of either theoretical or applied research. While this is not a dichotomy, some journals and fields favor one approach to research reports over the other. For example, *Research Quarterly for Exercise and Sport* focuses more on theory by

publishing research that contributes significantly to the knowledge base of the field. Another example from many new journals specializing in the scholarship of teaching and learning (SoTL) is whether the journal favors quantitative or qualitative methods. SoTL is specific research on learning the knowledge and methods of an academic discipline. Some disciplines have SoTL journals with a tradition of qualitative learning research, so authors using mixed methods or quantitative designs should know that their methodology may be fairly unique to journal reviewers.

Journals that publish research on specific sports or subdisciplines have fairly clear missions, but establishing what is a relevant and meaningful contribution to the field in a multidisciplinary journal is often open to interpretation. Editors of multidisciplinary journals should publish general descriptions of how relevance and significance to the journal are defined so that there are fewer misunderstandings between authors and the editorial team. Whatever the type of journal, the author instructions should be clear regarding what a journal considers a relevant or meritorious submission and whether this involves a judgment about scientific validity and/or is a prerequisite judgment of merit prior to sending the report for peer review.

One recent issue we have noticed that may negatively influence the evaluation of a manuscript is unclear author instructions regarding electronic submissions. Often electronic submission systems require that manuscript and support materials be submitted in separate files that are automatically assembled into a manuscript for internal review. When this is the case, the author instructions should be very detailed regarding how the elements of a submission will be uploaded to the system. A checklist with instructions for submission can help authors navigate online systems that may be confusing and different from journal to journal. This is important because some reviewers are quite strict on format/structure issues and use them as surrogate indicators of attention to detail and quality.

Establish Collaborative Evaluation Procedures and Roles

Clear evaluation standards will help the editorial team work with the same vision of article quality, but a journal editor should also establish and publish collaborative policies and procedures for evaluating manuscripts. Author instructions should state the journal's philosophy of peer review as well as the procedures and policies the editor employs to ensure the journal mission is fulfilled. For example, authors and reviewers should know who is responsible for initial screening of papers for possible external review, synthesis of reviews, and final editorial decisions. Collaborative roles distribute the work tasks and reduce misunderstandings and duplicated effort within the editorial team.

The editorial teams of journals change over time, so new generations of the editorial team may propose changes in policies and procedures. Normally when the editorial team is led by an editor in chief, this editor has previously served as a section or associate editor or has served overlapping terms with a previous editor in chief. These apprenticeship experiences ensure smooth transitions and that important policy and procedural decisions are not lost over time. In this way, proposed changes for continuous improvement are more effective because any that were not successful in the past will not likely be repeated.

Author instructions for a journal should state whether the editor in chief or an associate editor makes an initial evaluation of suitability before external reviews are solicited and, if so, whether these judgments are limited to a certain expectation of importance to the field (e.g., top 25%). Authors need to know how the important decision on the suitability, merit, or contribution question will be evaluated, as well as by whom and when this decision is made. Considerable time for authors and the editorial team will be wasted when articles outside the mission of the journal are submitted. Journal acceptance rates will also be more accurate when manuscripts that are immediately rejected for lack of merit/suitability are reduced.

Author instructions should specify the journal policy on expected referee qualifications. Authors should know if preferred or not-preferred referees can be nominated and whether the journal requires specific reviews from methodology or statistical experts. An expected timeframe for initial and additional reviews should be published, along with the expectation that reviews will be respectful and constructive in the evaluation of strengths and weaknesses. At least annually, editors should publish summary data about the journal including: number of papers submitted, rejection rate, average/median review time, average/median time from acceptance to publication, and other relevant information.

Some reviewers do not see authors as peers and equals and provide openly antagonistic and disrespectful critiques (Raff & Brown, 2013). Reviewers should not see themselves as gatekeepers, judges of ultimate truth, or defenders of specific theories or experimental methodologies. Overtly disrespectful or hostile reviews have negative consequences for the journal. Authors will interpret this disrespect as evidence of bias in the reviewer, editorial team, and the journal. Editors do not want hostile authors who may communicate with other scholars about a battle with poor peer reviews from their journal. The author(s) poisoned by a disrespectful review might not submit research or review research for the journal in the future.

Editorial policy should state that reviewers consider authors as peers, so reviewers have an ethical responsibility to evaluate submissions with openness and fairness and to provide constructive critique. Editors should not return

biased, inaccurate, or antagonistic comments in reviews to authors.

Use Online Manuscript Data to Help Reviewers Improve

Many journals currently use online manuscript review and management systems that facilitate the reviewers' work in searching databases for related literature and for submitting reviews. The journal management system should provide guidelines and training materials for reviews. Many of these manuscript or publisher systems also allow for efficient data collection about reviews, timing, quality, and subsequent communication that should be used by editors to assess the peer-review process and to help reviewers improve. Holt and Spence (2012) also recommended that journals provide training and feedback to reviewers.

Reviewers should be given copies of other reviewers' reports and editorial feedback/decisions, as well as periodic feedback or evaluations of their reviews (Hames, 2007; Hartley, 2012; Holt & Spence, 2012). Internal reviewer evaluation information (timeliness, tone, quality, and specificity of feedback to authors) should form the basis for feedback to individual reviewers on the quality of their service. If the editorial team expects a certain level of reviewer performance, feedback should be given so that reviewers can determine if they need additional training or mentoring. A simple 5-point scale for evaluating reviewers has been shown to be moderately reliable and to correlate with the ability to identify flaws in studies (Callahan et al., 1998). Periodically, the editor should also share with all journal reviewers examples of blinded exemplar or outstanding reviews. Reviewer evaluation information is important in planning training to improve review quality and consistency. This information may also be useful in identifying future section editors and editors in chief.

The training of reviewers for kinesiology journals should also be extended to graduate students. Graduate programs should provide training on critical review of literature and best practices in blinded peer review. Strong graduate training in research methodology has been associated with high-quality reviews in medicine (Black et al., 1998). Confidentiality issues related to submissions, reviews, and inviting graduate students to monitor or even perform reviews should be addressed in the journal editorial policy.

Establish a Procedure for Author Appeals

Several authors have recommended that journals develop specific appeals procedures for authors of rejected papers (Albers, Floyd, Fuhrmann, & Martinez, 2011; Hojat et al., 2003; Schwartz & Zamboanga, 2009), and some journals have successfully implemented ombudspersons to handle problems with the editorial process (Horton, 1998; Wager & Kleinert, 2012). Given the importance of publishing

research in certain journals for tenure/promotion and grants for many faculty, journals should establish an appeal procedure that can address the rare cases where inconsistent or poor reviews may have disadvantaged a strong paper. These situations would normally be quite rare, because the editor in chief can serve as a reviewer or solicit another review to resolve most problems. Journals that establish appeal procedures or ombudspersons should establish specific minimal conditions (e.g., evaluation criteria that can be appealed, certain minimum standards on a positive review, and evidence of error, bias, or inconsistency in reviews) for an appeal to be considered. This would reduce the nuisance appeals from articles that clearly are not of adequate quality to meet a journal's mission or standards. Journals should determine if the editor/associate editors, original reviewers, or new reviewers are used in these appeals. Improvements in peer-review standards and the specific minimal standards for appeals should ensure that the number of papers in an appeal process would be quite low and would not burden or affect the trust built within the editorial team.

Protect Time Commitment of Editors and Reviewers

Reviewers donate several hours of time to review each research report. Every effort should be made to protect the reviewer's time to encourage repeated and quality reviews. Editors can track the frequency of requests for reviews and work to ensure the review procedures and roles are closely followed. Editors should integrate their own reviews with those from external reviewers to create clear editorial decision letters. This integrated feedback to authors is important so that only one additional round of reviews is needed for a report with potential. For example, the editors handling conflicting recommendations from two reviewers should clarify which position they support so authors know where they stand on controversial issues. Editors who lay out exactly which comments are important to integrate into a new revision will make revisions more focused and not leave authors guessing how to handle conflicting reviews. Previous reviewers or new reviewers brought in to resolve a controversy should not be subjected to numerous resubmissions to deal with partially revised papers or relieve editors from making publication decisions. Editors should also consider returning to authors or rejecting poor revisions that do not clearly address the general and specific comments provided by the editors and reviewers.

Improve Reviewer Recognition

Intrinsic rewards for serving as a reviewer include service to the field/discipline, academic prestige, and access to recent advances in the discipline. These rewards are often not enough for many editors to have an adequate pool of skilled reviewers to select for submissions. There may be declining

interest in many forms of professional service (Cardinal, 2013). We believe that editors, journals, and organizations should consider additional kinds of recognition for reviewers, beyond the traditional listing of reviewers in the journal and occasional letters of appreciation.

Inexpensive acknowledgement could be recognition meals or receptions at the conferences of the sponsoring society of the journal. These events can be used for training or can even involve awards for higher-quality reviews or reward such as Reviewer or Reviewers of the Year. The internal evaluation of reviewers by the editors of a journal could be easily expanded to provide single or multiple awards for excellent reviewer service. Recognition as a substantial contributor to the journal might begin to provide accolades that could be considered as meaningful academic service and could possibly contribute to tenure and promotion evaluations. Kachewar and Sankaye (2013) have proposed a framework for calculating contributions as a reviewer with various levels of recognition. They propose an evaluation system creating a reviewer index, directories of these ratings, recognition of high-quality reviews, and publication of the identity of reviewers who provide high-quality reviews.

Some journals provide financial compensation through subscriptions and electronic access, and some even pay for editorial and review services. Naturally, financial compensation for fast or highly rated reviews could be considered to increase the incentive for high-quality reviews.

CONCLUSIONS

Kinesiology journals use a variety of peer-review procedures and standards, and there is limited research on the effectiveness of peer review in the field. Research across other disciplines indicates strong support for traditional blinded peer review by scholars; however, a lack of clarity and subjectivity of the process often makes for poor-to-moderate interrater reliability. Article peer review is an important and difficult task, so there has been little prospective evidence documenting the effectiveness of training to improve reviews. Despite this lack of progress, several recommendations to improve peer review in kinesiology are logical and should be implemented and tested by future research.

WHAT DOES THIS ARTICLE ADD?

Continued controversy around the process of peer review of scientific research has called into question the validity and advancement of knowledge. There is limited research on this topic in kinesiology, so this narrative review documents peer-review practice in kinesiology and an extensive body of research on peer review from other disciplines and efforts

to improve peer review. Research in a variety of disciplines has shown somewhat positive but mixed results on the efficacy of peer review in evaluating the quality of and improving research reports submitted to journals. Because editors and reviewers wield much power in the peer-review system and provide such important services to the advancement of knowledge and the field of kinesiology, we propose six recommendations for peer-review improvement. Improved peer review will reduce the publication of erroneous and weak designs, statistical errors, and inappropriate interpretation of results in kinesiology research. Improved peer review will also improve the quality and clarity of communication of kinesiology research, as well as further the editorial mission of kinesiology journals. There is a need for editors and editorial teams of kinesiology journals to consider implementing strategies to improve peer review and subsequently the articles, evidence, and knowledge in kinesiology. Systematic research documenting the effectiveness of proposed improvements in peer review is also needed.

REFERENCES

- Albers, C. A., Floyd, R. G., Fuhrmann, M. J., & Martinez, R. S. (2011). Publication criteria and recommended areas of improvement within school psychology journals as reported by editors, journal board members, and manuscript authors. *Journal of School Psychology, 49*, 669–689.
- Alpert, J. S. (2007). Peer review: The best of the blemished? *American Journal of Medicine, 120*, 287–288. doi:10.1016/j.amjmed.2007.02.013
- Amonette, W. E., English, K. L., & Ottenbacher, K. J. (2010). Nullius in verba: A call for the incorporation of evidence-based practice into the discipline of exercise science. *Sports Medicine, 40*, 449–457.
- Armstrong, J. S. (1997). Peer review for journals: Evidence on quality control, fairness, and innovation. *Science and Engineering Ethics, 3*, 63–84.
- Baker, D. (2002). The peer review process in science education journals. *Research in Science Education, 32*, 171–180.
- Benos, D. J., Bashari, E., Caves, J. M., Gaggari, A., Kapoor, N., LaFrance, M., . . . Zotov, A. (2007). The ups and downs of peer review. *Advances in Physiology Education, 31*, 145–152. doi:10.1152/advan.00104.2006
- Black, N., van Rooyen, S., Godless, F., Smith, R., & Evans, S. (1998). What makes a good reviewer and a good review for a general medical journal? *Journal of the American Medical Association, 280*, 231–233.
- Bornmann, L., & Mungra, P. (2011). Improving peer review in scholarly journals. *European Science Editing, 37*, 41–43.
- Burham, J. C. (1990). The evolution of editorial peer review. *Journal of the American Medical Association, 263*, 1323–1329.
- Callahan, M. L., Baxt, W. G., Waeckerle, J. F., & Wears, R. L. (1998). Reliability of editors' subjective quality ratings of peer reviews of manuscripts. *Journal of the American Medical Association, 280*, 229–231.
- Callahan, M. L., Knopp, R. K., & Gallagher, E. J. (2002). Effect of written feedback by editors on quality of reviews: Two randomized trials. *Journal of the American Medical Association, 287*, 2781–2783.
- Callahan, M. L., & McCulloch, C. (2011). Longitudinal trends in the performance of scientific peer reviewers. *Annals of Emergency Medicine, 57*, 141–148.
- Callahan, M. L., & Schriger, D. L. (2002). Effect of structured workshop training on subsequent performance of journal reviewers. *Annals of Emergency Medicine, 40*, 323–328.

- Campanario, J. M. (1998). Peer review for journals as it stands today—Part 1. *Science Communication*, 19, 181–211.
- Cardinal, B. J. (2013). Service vs. serve-us: What will your legacy be? *Journal of Physical Education, Recreation and Dance*, 84(5), 4–6.
- Committee on Publication Ethics. (2011). *Code of conduct and best practice guidelines for journal editors*. Retrieved from <http://publicationethics.org/resources/code-conduct>
- Faulkner, G., Taylor, A., Ferrence, R., Munro, S., & Selby, P. (2006). Exercise science and the development of evidence-based practice: A 'better practices' framework. *European Journal of Sport Science*, 6, 117–126.
- Hames, I. (2007). *Peer review and manuscript management in scientific journals: Guidelines for good practice*. Oxford, England: Blackwell.
- Hardie, J. (2010). Is this article worth reading? A critical analysis of peer review. *Oral Health*, 100(9), 70–72, 74, 76–77.
- Hargens, L. L. (1988). Scholarly consensus and journal rejection rates. *American Sociological Review*, 53, 139–151.
- Hartley, J. (2012). Refereeing academic articles in the information age. *British Journal of Educational Technology*, 43, 520–528.
- Hirst, A., & Altman, D. G. (2012). Are peer reviews encouraged to use reporting guidelines? A survey of 116 health research journals. *PLoS ONE*, 7, e35621. doi:10.1371/journal.pone.0035621
- Hojat, M., Gonnella, J. S., & Caelleigh, A. S. (2003). Impartial judgment by the 'gatekeepers' of science: Fallibility and accountability of the peer review process. *Advances in Health Sciences Education*, 8, 75–96.
- Holt, N. L., & Spence, J. C. (2012). A review of the peer review process and implications for sport and exercise psychology. *Athletic Insight*, 14(1). Retrieved from <http://www.athleticinsight.com/Vol14Iss1/Feature.htm>
- Horrobin, D. F. (2001). Something rotten at the core of science? *Trends in Pharmacological Sciences*, 22, 51–52.
- Horton, R. (1998). The journal ombudsperson: A step towards scientific press oversight. *Journal of the American Medical Association*, 280, 289–299.
- Houry, D., Green, S., & Callahan, M. (2012). Does mentoring new peer reviewers improve review quality? A randomized trial. *BMC Medical Education*, 12, 83.
- James, C. R., & Bates, B. T. (1997). Experimental and statistical design issues in human movement research. *Measurement in Physical Education and Exercise Science*, 1, 55–69.
- Jefferson, T., Rudin, M., Brodney Fose, S., & Davidoff, F. (2008). Editorial peer review for improving the quality of reports of biomedical studies. *Cochrane Database of Systematic Reviews*, 2, doi:10.1002/14651858.MR000016.pub3
- Jefferson, T., Wager, E., & Davidoff, F. (2002). Measuring the quality of editorial peer review. *Journal of the American Medical Association*, 287, 2786–2790.
- Kachewar, S. G., & Sankaye, S. B. (2013). Reviewer index: A new proposal of rewarding the reviewer. *Mens Sana Monographs*, 11, 274–284.
- Kaplan, D. (2005). How to fix peer review: Separating its two functions—improving manuscripts and judging their scientific merit—would help. *Journal of Child and Family Studies*, 14, 321–323.
- Knudson, D. (2005). Statistical and reporting errors in applied biomechanics research. In Q. Wang (Ed.), *Proceedings of the XXIII International Symposium on Biomechanics in Sports* (Vol. 2, pp. 811–814). Beijing, China: China Institute of Sport Science.
- Knudson, D. (2007). Analysis of multiple comparison errors using ground reaction force data. In H.-J. Menzel & M. H. Chagas (Eds.), *Proceedings of the XXVth International Symposium on Biomechanics in Sports* (pp. 176–179). Belo Horizonte, Brazil: Federal University of Minas Gerais.
- Knudson, D. (2009). Significant and meaningful effects in sports biomechanics research. *Sports Biomechanics*, 8, 96–104.
- Knudson, D., Elliott, B., & Ackland, T. (2012). Citation of evidence for research and application in kinesiology. *Kinesiology Review*, 1, 129–136.
- Lamont, M. (2009). *How professors think: Inside the curious world of academic judgment*. Cambridge, MA: Harvard University Press.
- Lee, C. J., Sugimoto, C. R., Zhang, G., & Cronin, B. (2013). Bias in peer review. *Journal of the American Society for Information Science and Technology*, 64, 2–17.
- Lundbrook, J. (1998). Multiple comparison procedures updated. *Clinical and Experimental Pharmacology and Physiology*, 25, 1032–1037.
- Luty, J., Arokiadass, S. M. R., Easow, J. M., & Anapreddy, J. R. (2009). Preferential publication of editorial board members in medical specialty journals. *Journal of Medical Ethics*, 35, 200–202.
- Miller, C. C. (2006). Peer review in the organizational and management sciences: Prevalence and effects of reviewer hostility, bias, and dissensus. *Academy of Management Journal*, 49, 425–431.
- Morrow, J. R., Jr, Bray, M. S., Fulton, J. E., & Thomas, J. R. (1992). Interrater reliability of 1987–1991 *Research Quarterly for Exercise and Sport* reviews. *Research Quarterly for Exercise and Sport*, 63, 200–204.
- Morrow, J. R., Jr, & Frankiewicz, R. G. (1979). Strategies for the analysis of repeated and multiple measures designs. *Research Quarterly*, 50, 297–305.
- Mullineaux, D. R., Bartlett, R. M., & Bennett, S. (2001). Research design and statistics in biomechanics and motor control. *Journal of Sports Sciences*, 19, 739–760.
- Park, R. J. (1980). The *Research Quarterly* and its antecedents. *Research Quarterly for Exercise and Sport*, 51, 1–22.
- Raff, H., & Brown, D. (2013). Civil, sensible, and constructive peer review in APS journals. *Journal of Applied Physiology*, 115, 295–296.
- Rothwell, P. M., & Martyn, C. N. (2000). Reproducibility of peer review in clinical neuroscience. *Brain*, 123, 1964–1969.
- Schroter, S., Black, N., Evans, S., Carpenter, J., Godlee, F., & Smith, R. (2004). Effects of training on quality of peer review: Randomized controlled trial. *British Medical Journal*, 328, 673–675.
- Schwartz, S. J., & Zamboanga, B. L. (2009). The peer-review and editorial system. Ways to fix something that might be broken. *Perspective on Psychological Science*, 4, 54–61.
- Smith, R. (2006). Peer review: A flawed process at the heart of science journals. *Journal of the Royal Society of Medicine*, 99, 178–182.
- Souder, L. (2011). The ethics of scholarly peer review: A review of the literature. *Learned Publishing*, 24, 55–74.
- Vecchio, R. P. (2006). Journal reviewer ratings: Issues of particularistic bias, agreement, and predictive validity within the manuscript review process. *Bulletin of Science, Technology & Society*, 26, 228–242. doi:10.1177/0270467606288595
- Wager, E., & Kleintert, S. (2012). Cooperation between research institutions and journals on publication integrity cases: Guidance from the Committee on Publication Ethics (COPE). *Maturitas*, 72, 165–169.
- Ware, M., & Monkman, M. (2008). *Peer review in scholarly journals: Perspectives of the scholarly community—an international study*. Loodrecht, The Netherlands: Publishing Research Consortium.
- Wheeler, B. (2011). The ontology of the scholarly journal and the place of peer review. *Journal of Scholarly Publishing*, 42, 307–322. doi:10.1087/20110109
- Zhu, W. (2012). Sadly, the earth is still round ($p < 0.05$). *Journal of Sport and Health Science*, 1, 9–11.

Copyright of Research Quarterly for Exercise & Sport is the property of Routledge and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.