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Reporting Standards for Research Publications

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Abstract

Reporting standards for research publications and ethical issues relevant to publishing research findings are presented to provide best practices for counselors, counselor educators, researchers, educators, and other mental health practitioners and for contributors to the *Counseling Outcome Research and Evaluation* (*CORE*) journal. Topics include ethical issues in publishing research, reporting standards for research, validity and reliability evidence, and standards used to report reliability and validity evidence.

Keywords

validity, reliability, ethical standards, reporting standards, publishing

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The *Counseling Outcome Research and Evaluation* (*CORE*) journal's purpose, as described by the editor in the premiere issue of the journal (Hays, 2010), is to attend to the integration of science and practice in counseling and to provide best practices in outcome research for counselors, counselor educators, researchers, educators, and other mental health practitioners. The intent of this article is to present reporting standards for research publications and to discuss some ethical issues relevant to publishing research findings. The article is divided into four sections: Ethical Issues in Publishing Research, Reporting Standards for Research, Validity and Reliability Evidence, and Standards Used to Report Reliability and Validity Evidence.

As you read the article, note that the topic of reporting standards for research publications involves much more than knowledge of measurement theories and research methodology techniques. Ethical issues in conducting and publishing research are central to the research enterprise. Once individuals are mentored as research protégés and integrated into the community of scholars, their ethical conduct in all aspects of work as a scientist become as important as their ethical conduct as counseling practitioners.

Ethical Issues in Publishing Research

As members of a profession with a code of ethics, it is essential that researchers become familiar with their ethical responsibilities. Individuals conducting counseling outcome research and evaluation studies may belong to one or all of the following associations with separate codes of ethics independently adopted by

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each professional association: American Counseling Association (ACA), American Educational Research Association (AERA), and American Psychological Association (APA).

The *ACA Code of Ethics* (ACA, 2005) serves a number of purposes but the one paramount to this article follows: "1. The *Code* enables the association to clarify to current and future members, and to those served by members, the nature of the ethical responsibilities held in common by its members." As an educational, scientific, and professional association, ACA has addressed eight areas in Sections A to H. The two salient sections of interest in this article are Section E on Evaluation, Assessment, and Interpretation and Section G on Research and Publication. Section E will be discussed in detail in the section of this article entitled Reliability and Validity. It is essential that counselors report research findings accurately (see Section G.4.a, *ACA Code of Ethics*, 2005) and that " . . . They explicitly mention all variables and conditions known to the investigator that may have affected the outcome of a study or the interpretation of data. . . . " The portions of Section G particularly relevant to ethical issues in publishing, G.5.a to G.5.h, are reproduced in Table 1. Counselors must avoid plagiarism defined as the presentation of the work of another person as your own ideas or intellectual property. Counselors must give credit to all collaborators who have contributed to the research or concept development. From my experience as an author, frequent collaborator, and editor of two different journals, counselors should follow the recommendation of the American Physiological Society (APS) in the ethical standards poster reprinted by permission as Figure 1 (APS, 2008) entitled, What you need to know about ETHICAL ISSUES when Writing a Scientific Paper: "Agree on authorship before writing begins, preferably at the start of the study."

In the *Ethical Standards of the American Educational Research Association* (AERA, 2000), the Foreword states, "Educational researchers come from many disciplines, embrace several competing theoretical frameworks, and use a variety of research methodologies. AERA recognizes that its members are already guided by codes in the various disciplines and, also, by organizations such as Institutional Review Boards (IRBs). . . . " Many counselors are members of both ACA and AERA Division E, Counseling and Human Development. There are six Guiding Standards including: I. Responsibilities to the Field; II. Research Populations, Educational Institutions, and the Public; III. Intellectual Ownership; IV. Editing, Reviewing, and Appraising Research; V. Sponsors, Policymakers, and Other Users of Research; and VI. Students and Student Researchers. Two particularly relevant standards under I. Responsibilities to the Field are "1. Educational researchers should conduct their professional lives in such a way that they do not jeopardize future research, the public standing of the field, or the discipline's research results." and "2. Educational researchers must not fabricate, falsify, or misrepresent authorship, evidence, data, findings, or conclusions." Authorship is discussed in detail in III. Intellectual Ownership; however, the most illuminating statement is in the Preamble: "Intellectual ownership is predominately a function of creative contribution. Intellectual ownership is not predominately a function of effort expended."

The third code of ethics to be discussed, the *Ethical Principles of Psychologists and Code of Conduct*, was approved by the APA in 2002 effective in 2003 (APA, 2003). It states, "This Ethics Code applies only to psychologists' activities that are part of their scientific, educational, or professional roles as psychologists. Areas covered include but are not limited to the clinical, counseling, and school practice of psychology; research; teaching; supervision of trainees; public service; policy development; social intervention; development of assessment instruments; conducting assessments; educational counseling; organizational consulting; forensic activities; program design and evaluation; and administration" (p. 1). Many counselors and assessment professionals are members of ACA, AERA, and one or more divisions of APA including Divisions 5: Evaluation, Measurement and Statistics; 15: Educational Psychology; 16: School Psychology; 17: Society of

Table 1. ACA Code of Ethics—Section G. Research and Publication—G5. Publication

Section	Heading	Content
G.5.a	Recognizing contributions	When conducting and reporting research, counselors are familiar with and give recognition to previous work on the topic, observe copyright laws, and give full credit to those to whom credit is due.
G.5.b	Plagiarism	Counselors do not plagiarize, that is, they do not present another person's work as their own work.
G.5.c	Review/republication of data or ideas	Counselors fully acknowledge and make editorial reviewers aware of prior publication of ideas or data where such ideas or data are submitted for review or publication.
G.5.d	Contributors	Counselors give credit through joint authorship, acknowledgment, footnote statements, or other appropriate means to those who have contributed significantly to research or concept development in accordance with such contributions. The principal contributor is listed first and minor technical or professional contributions are acknowledged in notes or introductory statements.
G.5.e	Agreement of contributors	Counselors who conduct joint research with colleagues or students/ supervisees establish agreements in advance regarding allocation of tasks, publication credit, and types of acknowledgement that will be received.
G.5.f	Student research	For articles that are substantially based on students course papers, projects, dissertations or theses, and on which students have been the primary contributors, they are listed as principal authors.
G.5.g	Duplicate Submission	Counselors submit manuscripts for consideration to only one journal at a time. Manuscripts that are published in whole or in substantial part in another journal or published work are not submitted for publication without acknowledgment and permission from the previous publication.
G.5.h	Professional review	Counselors who review material submitted for publication, research, or other scholarly purposes respect the confidentiality and proprietary rights of those who submitted it. Counselors use care to make publication decisions based on valid and defensible standards. Counselors review article submissions in a timely manner and based on their scope and competency in research methodologies. Counselors who serve as reviewers at the request of editors or publishers make every effort to only review materials that are within their scope of competency and use care to avoid personal biases

Counseling Psychology; among others. Of the 10 standards, the most relevant for this article, Standard 8: Research and Publication and Standard 9: Assessment, are discussed in the section of this article entitled Validity and Reliability Evidence. APA Standard 8.11 defines plagiarism and Standard 8.12 clarifies publication credit as discussed above. Further clarification of student dissertation authorship states: "8.12 (c) 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."

An APA standard often cited but frequently misunderstood is 8.13 on duplicate publication of data. It states: "Psychologists do not publish, as original data, data that have been previously published. This does not preclude republishing data when they are accompanied by proper acknowledgment." Keep in mind that the journal editor to whom you submit a manuscript should be informed if republishing is a concern and provided citations to all previously published manuscripts using the data in question. In many disciplines, this is referred to as redundant

What you need to know about ETHICAL ISSUES when Writing a Scientific Paper

The most common Ethical Problems found in scientific papers (and how to avoid them):

	Definition	How to Avoid
Plagiarism	Taking the work of another. Copying a figure, table, data, or even wording from a published or unpublished paper without attribution.	Provide citations to the work of others. Do not copy exact wording from another's paper to yours, even if referenced, unless in quotes.
Duplicate Publication	Submission of or publication of the same paper or substantial parts of apaper in more than one place.	Do not submit the same paper or parts of that paper to more than one journal at a time. Wait until your paper is rejected or withdraw it before submitting elsewhere.
Redundant Publication	Using data from another paper (usually your own) in a new paper. Also called auto- or self-plagiarism.	Do not use data from a previous study, even for statistical analysis. Repeat necessary control groups for each experiment.
Falsification and Fabrication	Changing or making up data in a manuscript, usually to improve the results of the experiment.	Paper should reflect exactly the protocol followed and the results in the experiment.
Figure Manipulation	Altering a figure so that the published figure does not match exactly the image or data acquired.	Do not obscure, move, remove, or introduce information or features. Do not combine parts of different figures so that they look like one. Any manipulations must apply to the whole image and be disclosed.
Human/Animal Welfare Issue	Treatment of animal or human subjects that does not meet standards or journal policy.	You must have IRB or IACUC approval for the study protocol. Do not deviate from the approved protocol.
Conflict of Interest	Real or perceived conflict due to employment, consulting, or investment in entities with an interest in the outcome of the research.	Disclose all potential conflicts to the Editor of the journal and within the manuscript.
Authorship	Disputes arising from addition, deletion, or change of order of authors.	Agree on authorship before writing begins, preferably at the start of the study. Sign publishers' authorship forms. All authors should have made a substantial contribution to the paper.

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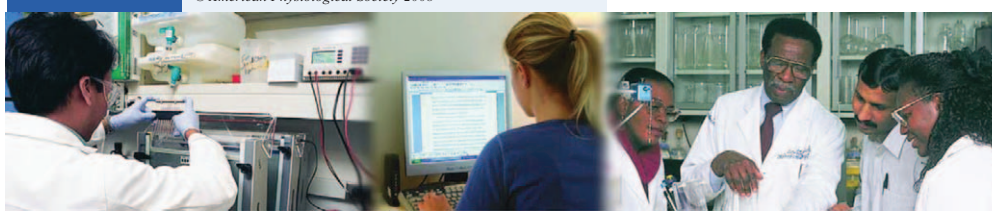

Figure 1. What you need to know about ETHICAL ISSUES when Writing a Scientific Paper (APS, 2008)

publication. The APS (2008) defines redundant publication as: "Using data from another paper (usually your own) in a new paper. Also called auto- or self-plagiarism. Do not use data from a previous study even for statistical analysis. Repeat necessary control groups for each experiment" (see Figure 1). The *ACA Code of Ethics* (ACA, 2005) Section G.5.g on duplicate submission and publication states: "Counselors submit manuscripts for consideration to only one journal at a time. Manuscripts that are published in whole or in substantial part in another journal or published work are not submitted for publication without acknowledgment and permission from the previous publication."

Whether an author is a student or professional with many years of experience, reading for the first time or reviewing annually the ethical standards of your profession and professional associations related to research and publication is very important. Reading the various codes of ethics allow professionals and professionals-in-training to be familiar with the required standards of the profession as well as to aspire to the highest ideals of the profession (APA, 2003).

Reporting Standards for Research

When preparing manuscripts for CORE, be sure to use this most recent edition of the style manual. One change from the fifth (APA, 2001) to sixth edition (APA, 2010) that may be particularly useful is the addition of the Appendix with Journal Article Reporting Standards (JARS), Meta-Analysis Reporting Standards (MARS), and Flow of Participants through Each Stage of an Experiment or Quasi-Experiment. Since the publication of the first edition of the *Publication Manual* in 1952, the APA publication manual has become the standard style manual for journals publishing in the social sciences including counseling and education as well as psychology. Beyond the use of the *APA Publication Manual*, all journals and many associations have very specific guidelines developed to enhance and somewhat standardize information reported in published articles. Read the Guidelines for Authors, editorials written by the current editor, and any standards on the journal or association's website.

Numerous articles published in the flagship journals of ACA, AERA, and APA have been written on reporting standards. Particularly relevant articles published in the *American Psychologist* discuss the recent changes from the fifth (APA, 2001) to the sixth edition (APA, 2010) of the *Publication Manual of the American Psychological Association* (APA Publications and Communications Board Working Group on Journal Article Reporting Standards, 2008) and changes from the fourth (APA, 1994) to the fifth edition of the manual in the Report of the Task Force on Statistical Inference (Wilkinson & the Task Force on Statistical Inference, 1999).

The AERA Task Force on Reporting of Research Methods in AERA Publications produced draft standards for qualitative and quantitative methods. The approved standards entitled "Standards for Reporting on Empirical Social Science Research in AERA Publications" were published in *Educational Researcher* (AERA, 2006). Two overarching principles are "First, reports of empirical research should be *warranted*; that is, adequate evidence should be provided to justify the results and conclusions. Second, reports of empirical research should be *transparent*; that is, reporting should make explicit the logic of inquiry and activities that led from the development of the initial interest topic, problem or research question; through the definition, collection, and analysis of empirical data or evidence; the articulated outcomes of the study" (p. 33). It is important to reiterate that empirical social science research refers to both qualitative and quantitative methods.

A second task force was appointed to develop draft standards for humanities-oriented research to complement the standards for empirical social science research. The "Standards for Reporting on Humanities-Oriented Research in AERA Publications" was subsequently published in *Educational Researcher* (AERA, 2009). These standards state: "The term *humanities-oriented* is intended to capture a constellation of familiar education research genres used in domains such as history or philosophy, for which the *Social Science Standards* are clearly not suited, and also to

include emergent approaches to education research not as readily identifiable with traditional humanities disciplines" (p. 481).

The AERA Standards discussed above are as relevant to ACA and APA publications as they are to AERA publications. Similarly, numerous articles have been published in the *Journal of Counseling & Development*, the flagship journal of ACA, on reporting mixed methods research in counseling and beyond (Leech & Onwuegbuzie, 2010); statistical, practical, and clinical significance (Thompson, 2002); effect size in quantitative research (Trusty, Thompson, & Petrocelli, 2004); and qualitative research (Choudhuri, Glauser, & Peregoy, 2004). These articles are a must read for counselors publishing in ACA sponsored or ACA division sponsored journals.

It is apparent that the best guide to getting published and using appropriate reporting standards is to read many journal articles and editorials of the current and past editors of the journals to which you plan to submit manuscripts. A recent edited book entitled *The Reviewer's Guide to Quantitative Methods in the Social Sciences* (Hancock & Mueller, 2010) provides 31 chapters written by methodological and applied scholars who are expert in the particular method and addresses best practices for each of the quantitative methods including measurement and assessment topics. The book is written not only for journal manuscript reviewers but also as a guide for researchers and graduate students designing and reporting research projects.

Validity and Reliability Evidence

Researchers are continually reminded in textbooks (Allen & Yen, 1979), book chapters (Crocker, 2006; Elmore & Bradley, 2001), and journal author guidelines (Thompson, 1994) that validation is a continuing, never-ending, ongoing process. The statements that "the test is valid" or "the test is reliable" are no longer appropriate for scholarly writing. Test scores are no longer considered to have meaning but the inferences drawn from test scores by researchers and professionals are considered to have meaning. Researchers and authors should obtain and report reliability and validity evidence for each use of a test, instrument, or scale for each sample of participants for each particular setting in which the instrument is used.

Traditionally, validity was classified as content, criterion-related, and construct validity. Content validity referred, "to the degree to which items on the instrument are representative of the domain to be measured and is determined by experts in the field" (Elmore & Bradley, 2001, p. 470). Content validity determination "is based on individual, subjective judgment" (Allen & Yen, 1979, p. 95).

Criterion-related validity was historically classified into concurrent and predictive validity. "When criterion-related validity evidence is obtained, it is required that the criterion be reliable, appropriate for the setting, and free of contamination. For concurrent validity, the instrument being studied and the criterion are obtained simultaneously; for predictive validity, the criterion is obtained some time after the instrument being studied" (Elmore & Bradley, 2001, p. 470). Usually criterion-related validity evidence is expressed as a correlation coefficient between the test or predictor score and the criterion score" and referred to as a validity coefficient (Allen & Yen, 1979).

Construct validity evidence is "dictated by the nature of the psychological theory about the trait purportedly measured by the test" (Crocker, 2006; Cronbach, 1971). Methods of obtaining construct validity evidence include exploratory and confirmatory factor analysis, multitrait-multimethod techniques, group differences, change following an intervention, among others.

For the last 20 years, a number of measurement researchers (Cronbach, 1991; Ellis & Blustein, 1991a, 1991b; Messick, 1995; Moss, 1995; Schafer, 1991) have questioned whether all validity can be subsumed under construct validity. Messick (1995) proposed a unified concept of construct validity that included six complementary aspects. The first five aspects (content representational, substantive, structural, generalizability, and external) were practiced in the measurement community using different labels and terminology. The sixth

aspect, consequential, was more controversial. Messick's conceptualization provided a comprehensive theory of construct validity that addressed score meaning and the social consequences of score use. Messick stated: "Thus, validity and values are one imperative, not two, and test validation implicates both the science and the ethics of assessment, which is why validity has force as a social value" (p. 749). Recently, Lissitz and Samuelsen (2007a, 2007b) raised questions about the current unified theory and suggested a different way of conceptualizing the problem, starting a dialogue among numerous scholars with articles published in two issues of *Educational Researcher* (Embretson, 2007; Gorin, 2007; Kane, 2008; Mislevy, 2007; Moss, 2007; Sireci, 2007).

From classical true score theory, we know that a validity coefficient cannot be higher than the square root of the reliability coefficient; however, the validity coefficient can be greater than the reliability coefficient (Allen & Yen, 1979). For example, if a reliability coefficient is .81, the maximum value of the validity coefficient is .90. Therefore, score reliability sets the limit for the validity coefficient and affects the interpretations of validity evidence in research studies.

Synonyms for reliability might be stability and consistency. The three types of reliability commonly used in counseling and psychology research are test–retest, a measure of stability; parallel forms, a measure of equivalence; and internal consistency, a measure of internal structure. In general, stability coefficients are used when the instrument measures a trait not affected by memory or practice. Test–retest reliability, a measure of stability, is assessed by administering the same instrument at two different times. The amount of time lapse between administrations can vary from 2 weeks to a year or more. Parallel forms reliability, a measure of equivalence of two instruments, is assessed by administering two different test forms at the same time. Correlation coefficients are commonly used for reporting estimates of test–retest and parallel forms reliability.

Internal consistency reliability coefficients such as Cronbach's alpha and Kuder-Richardson 20 and 21 are estimates of the unidimensionality of the construct or trait measured by the instrument. Kuder-Richardson 20 is used for instruments with dichotomous responses to items such as correct–incorrect whereas Cronbach's alpha is used for rating scales or instruments that have more than a two-category response such as a Likert-type scale. There are other methods of determining reliability such as using item response theory (Embretson & Yang, 2006) and generalizability theory (Shavelson & Webb, 2006) models.

Standards Used to Report Reliability and Validity Evidence

The location in the article for reporting reliability and validity evidence is specified in the *Publication Manual of the American Psychological Association* (sixth ed., APA, 2010), which states that "measurement approaches (including the psychometric properties of the instruments used)" should be a subsection of the Method section of a manuscript (p. 29). Furthermore, it states for measures and covariates: "Include in the Method section information that provides definitions of all primary and secondary outcome measures and covariates, including measures collected but not included in this report. Describe the methods used to collect data (e.g., written questionnaires, interviews, and observations) as well as methods used to enhance the quality of the measurements (e.g., the training and reliability of assessors or the use of multiple observations). Provide information on instruments used, including their psychometric and biometric properties and evidence of cultural validity" (p. 31).

Besides location of the information in a manuscript, it is important to use standards developed and accepted by the profession to determine the type of information to report. The most important reference is the *Standards for Educational and Psychological Testing* (AERA, APA, & National Council on Measurement in Education [NCME], 1999). The Standards were first published in 1966 and were revised in 1985 and 1999. A joint committee appointed by AERA, APA, and NCME is responsible for

revising the 1999 Standards with a draft document scheduled for public review and comments in the fall of 2010 at http://teststandards.org (Joint Committee, 2009).

The first two sections of Part I of the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999) are chapters on (1) validity and (2) reliability and errors of measurement. Each section includes background information on the topic and then the relevant Standards. Definitions of types of validity evidence are presented under background similar to the information presented in the previous section of this article. Although it is not possible to include all information in Standards 1.1 to 1.24, an excellent précis is provided as the first paragraph of background: "Validity refers to the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests. Validity is, therefore, the most fundamental consideration in developing and evaluating tests. The process of validation involves accumulating evidence to provide a sound scientific basis for the proposed score interpretations. It is the interpretations of test scores required by proposed uses that are evaluated, not the test itself. When test scores are used or interpreted in more than one way, each intended interpretation must be validated" (p. 9).

The second chapter, Reliability and Errors of Measurement, provides an excellent summary under background as follows: "The critical information on reliability includes the identification of the major sources of error, summary statistics bearing on the size of such errors, and the degree of generalizability of scores across alternate forms, scorers, administrations, or other relevant dimensions. It also includes a description of the examinee population to whom the foregoing data apply, as the data may accurately reflect what is true of one population but misrepresent what is true of another" (p. 27). Similar to the chapter on validity, Standards 2.1 to 2.20 elaborate on this information.

No one can specify the actual validity or reliability coefficient that is "acceptable" or "high." Most measurement researchers agree that the determination of an acceptable value for a validity or reliability coefficient depends on the characteristics of the sample including size and heterogeneity, the type of assessment instrument, the number of items on the instrument, and the use of the test scores, among other considerations. For example, if an instrument is to be used to make irreversible decisions about someone, the validity and reliability coefficients should be .90 to .95. However, for research purposes, reliability coefficients are more often around .70 and validity coefficients much lower. The purposes of testing and the use of the test scores determine acceptable or "low" and "unacceptable" coefficients. An excellent article by Ponterotto and Ruckdeschel (2007) provides an overview of coefficient alpha as a measure of internal consistency reliability and a summary of experts' recommendations and research findings.

Results of a survey (Elmore, Ekstrom, & Diamond, 1993) of American School Counselor Association (ASCA) and Association for Measurement and Evaluation in Counseling and Development (AMECD), now Association for Assessment in Counseling and Education (AACE), members reinforced the importance of acquainting counselors with test use standards. Recommendations included familiarizing counselors with the *Code of Fair Testing Practices in Education* (CODE, Joint Committee on Testing Practices, 1988, 2004) and the *Responsibilities of Users of Standardized Tests* (RUST, Association for Assessment in Counseling, 2003; American Association for Counseling and Development/Association for Measurement and Evaluation in Counseling and Development [AACD/AMECD], 1989) in conjunction with the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1985, 1999) and the measurement section of the ethical standards of ACA (2005). Subsequent publications with particular emphasis on test standards for counselors, psychologists, and researchers and assessment competencies for professional school counselors have appeared in the *Handbook on Testing* (Ekstrom, Elmore, & Schafer, 1997); *Assessment Issues and Challenges for the Millennium* (Elmore et al., 2001); *Professional School Counseling: A Handbook of*

Theories, Programs & Practices (second ed., Ekstrom & Elmore, 2010; first ed., Elmore & Ekstrom, 2004b); and *Measuring Up: Assessment Issues for Teachers, Counselors and Administrators* (Elmore & Ekstrom, 2004a).

Summary

The intent of this article is to present reporting standards for research publications. The topic of reporting standards involves ethical issues in conducting and publishing research as well as knowledge of measurement theories and research methodology techniques (Green, Camilli, & Elmore, 2006).

Although I recommend that all research protégés read not only the references provided but also other references specific to counselor education, counseling psychology, educational psychology, social work, and school counseling, among others, that recommendation may be impractical. Key references that provide detailed information in a succinct format are

- ACA Code of Ethics (ACA, 2005);
- Publication Manual of the American Psychological Association (sixth ed., APA, 2010);
- Standards for Educational and Psychological Testing (APA, AERA, & NCME, 1999);
- Standards for reporting on empirical social science research in AERA publications (AERA, 2006); and
- Standards for reporting on humanities-oriented research in AERA publications (AERA, 2009).

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