

GuidelinesForScience.com*

Directors

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Checklist of Required Criteria for Useful Scientific Research^{a,b}

Paper title:	
Reviewer:	Date: ___/___/___ Time spent: ___ mins
Instructions for Raters	
<ul style="list-style-type: none"> You should need less than 2 hours to skim the paper as you complete the checklist Save a copy of this file with a filename that includes the first 3 words of the paper title, your last name, and the date Rate each lettered item (a-d), below, with a checkbox (☐) as <ul style="list-style-type: none"> T (True) if the research complies, na (not applicable), or F/? (False/Unclear) if the research does <i>not</i> comply, or if you are unsure. IMPORTANT: If you are not sure that a skeptical critic would be convinced the paper complied, rate the item F/?. If you rate an item True, give reasons for your rating after the ↗ symbol. Items with the na option marked * are <i>necessary</i> for science, but are not individually sufficient. Rate criteria 1-8 as True with a checkbox (☐), <i>only if all necessary lettered items (*) for the criterion are rated True.</i> 	
First assess whether the paper complies with the lettered items under each criterion, below. Then assess whether it complies with the criterion based on compliance with the subsidiary items. Do not speculate.	
Complies T na F/?	
1. Findings are useful ☐ <i>(Rater: Describe the finding that is most useful for prediction, decision-making, policy, or methods, and explain its value in your own words)</i> ↗	
a. Importance of findings explained in title☐, abstract☐, result tables☐, or conclusions☐ <i>(Rater: Check each that applies)</i> ↗	☐ * ☐
b. Findings on the direction or size of an effect are presented ↗	☐ * ☐
c. Findings on the direction or size of an effect are <i>shown</i> to be surprising relative to researchers or practitioners ↗	☐ * ☐
2. Prior scientific knowledge was comprehensively reviewed and summarized ☐ ↗	
a. The procedures for searching for prior useful scientific knowledge were objective and comprehensive	☐ * ☐
b. The paper describes how prior substantive findings were used in developing hypotheses and research procedures ↗	☐ * ☐
3. Disclosure is sufficiently comprehensive for understanding and replication ☐ ↗	
a. Prior hypotheses clearly described (e.g., regarding directions and magnitudes of relationships; effects of conditions) ↗	☐ * ☐
b. Revisions to hypotheses and conditions are described—if no changes were made, the author states that no changes were made ↗	☐ * ☐
c. Methods are fully and clearly described—or are well-known to readers, including potential users—researchers, students, and managers ↗	☐ * ☐
d. Data are easily accessible using information provided in the paper ↗	☐ * ☐
First assess whether the paper complies with the lettered items under each criterion, below. Then assess whether it complies with the criterion based on compliance with the subsidiary items. Do not speculate.	
Complies T na F/?	
4. Design was objective (unbiased by advocacy for a preferred hypothesis) ☐ ↗	
a. All reasonable hypotheses—including credible naïve/no-change/no-meaningful-difference and current-practice hypotheses—tested fairly ↗	☐ * ☐
5. Data are valid (true measures) and reliable (repeatable measures) ☐ ↗	
a. Data were shown to be relevant to the problem, or relevance was obvious ↗	☐ * ☐
b. All relevant data were used, including longest relevant time-series for time-series problems ↗	☐ ☐ ☐
c. Reliability of data was assessed, or was obvious ↗	☐ ☐ ☐
d. Other information needed for assessing the validity of the data is provided, such as known shortcomings and potential biases ↗	☐ ☐ ☐
6. Methods were valid (proven fit for purpose) and simple ☐ ↗	
a. Methods were shown to be valid—unless obvious to intended readers, users, and reviewers—and explained in plain English ↗	☐ * ☐
b. Multiple validated methods were used ↗	☐ ☐ ☐
c. Methods used cumulative scientific knowledge explicitly ↗	☐ ☐ ☐
d. Methods were sufficiently simple for all potential users of the findings to understand ↗	☐ ☐ ☐
7. Experimental evidence was used to compare alternative hypotheses ☐ ↗	
a. Experimental evidence was used to compare hypotheses under explicit conditions ↗	☐ * ☐
b. Predictive validity of hypotheses were tested using out-of-sample data ↗	☐ * ☐
8. Conclusions are based on evidence ☐ ↗	
a. Conclusions do not go beyond the evidence presented in the paper ↗	☐ * ☐
b. Conclusions explicitly describe how the papers' findings add to cumulative scientific knowledge ↗	☐ ☐ ☐
Summary comments ↗	

Sum the criteria (1–8) that are rated T(rue) for compliance: [] of 8.

^aAn electronic version of this checklist is available at GuidelinesforScience.com.

^bResearchers should consult [Armstrong & Green's "Guidelines for Science"](#) and rate their paper against this checklist before submitting.