




























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Directors

Kesten C. Green
(kesten.green@unisa.edu.au)

J. Scott Armstrong
(armstrong@wharton.upenn.edu)

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

Paper title:	
Reviewer:	Date: DD / MM / YY Start/finish times: : - :
Instructions	
<ul style="list-style-type: none"> • Raters should need less than 2 hours to skim read a paper and rate it for compliance with the items, then the criteria, below; less time after the first use of the checklist. • You must be convinced of the paper's usefulness by clear descriptions of the research process, findings, and conclusions. • Justify your rating for each item that you rate as True: Provide an explanation next to the  symbol. Check (<input checked="" type="checkbox"/>): 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. • Items with the na option marked * are <i>necessary</i> for science. If a necessary item is rated False, rate the criterion False. 	
First assess compliance with lettered items under each criterion, below. Then assess whether criteria 1 through 8 are true based on compliance with the subsidiary items. Do not speculate.	
Complies T na F/?	
1. Findings are useful (<i>Rater: describe the most useful finding and explain its value</i>) <input type="checkbox"/>	
 a. Importance of findings explained in title <input type="checkbox"/> , abstract <input type="checkbox"/> , result tables <input type="checkbox"/> , or conclusions <input type="checkbox"/> (<i>Rater: check each that applies</i>)	<input type="checkbox"/> * <input type="checkbox"/>
 b. Findings provide improved prediction, decision-making, policy, or methods	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 c. Directional or effect-size findings are presented	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 d. Directional or effect size findings are <i>shown</i> to be surprising to practitioners or researchers	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2. Prior scientific knowledge was comprehensively reviewed and summarized <input type="checkbox"/>	
 a. The procedures for searching for prior useful scientific knowledge were objective and comprehensive	<input type="checkbox"/> * <input type="checkbox"/>
 b. Cited authors were contact by the paper author to check that summaries of substantive findings and references were correct	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 c. Cited authors were contact by the paper author to check that no key studies are overlooked	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3. Disclosure is sufficiently comprehensive for understanding and replication <input type="checkbox"/>	
 a. Prior hypotheses clearly described (e.g., directions and magnitudes of relationships; effects of conditions)	<input type="checkbox"/> * <input type="checkbox"/>
 b. Revisions to hypotheses and conditions, if relevant, are described	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 c. Methods are fully and clearly described, or are well-known to readers	<input type="checkbox"/> * <input type="checkbox"/>
 d. Data are easily accessible using information provided in the paper	<input type="checkbox"/> * <input type="checkbox"/>
 e. Other information needed for understanding (e.g. acknowledgements, shortcomings, potential biases) is provided	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
First assess compliance with lettered items under each criterion, below. Then assess whether criteria 1 through 8 are true based on compliance with the subsidiary items. Do not speculate.	
Complies T na F/?	
4. Design was objective (<i>unbiased by advocacy for a preferred hypothesis</i>) <input type="checkbox"/>	
 a. All reasonable hypotheses, <i>including the "no change" hypothesis</i> , were represented fairly in the design	<input type="checkbox"/> * <input type="checkbox"/>
5. Data are valid (true measures) and reliable (repeatable measures) <input type="checkbox"/>	
 a. Data are shown to be relevant to the problem if not obvious to readers	<input type="checkbox"/> * <input type="checkbox"/>
 b. All relevant data were used to help ensure validity and compensate for biases	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 c. Longest available time-series used when analyzing time-series data	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 d. Reliability of data was assessed	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6. Methods were valid (proven fit for purpose) and simple <input type="checkbox"/>	
 a. Methods were shown to be valid for the problem, unless obvious to intended readers, users, and reviewers	<input type="checkbox"/> * <input type="checkbox"/>
 b. Multiple validated methods were used	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 c. Methods used cumulative scientific knowledge explicitly	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
 d. Methods were sufficiently simple for all potential users of the findings to understand	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
7. Experimental evidence was used to compare all reasonable alternative hypotheses <input type="checkbox"/>	
 a. All reasonable hypotheses were compared using experimental evidence under explicit conditions	<input type="checkbox"/> * <input type="checkbox"/>
 b. Predictive validity of hypotheses were tested using out-of-sample data	<input type="checkbox"/> * <input type="checkbox"/>
8. Conclusions are based on evidence <input type="checkbox"/>	
 a. Conclusions do not go beyond the evidence presented in the paper	<input type="checkbox"/> * <input type="checkbox"/>
 b. Conclusions contribute to cumulative scientific knowledge	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Summary comments 	

Sum the items (all a–e) and criteria (1–8) that are rated T(rue) for compliance: [] of 25; [] 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.