EDITORIAL POLICIES
Aims and Scope; Publishing in Cognition; Statistical Reporting

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Aims and Scope

Cognition publishes across a wide variety of topics. What binds them is a common interest in how the human mind represents, communicates, and acts upon the external environment. This interest may extend to how those faculties develop, how they may be shared with other species, or how they may be implemented in computational simulations of cognitive process and representation. The mental processes that support the cognitive system are hugely varied, and there are myriad ways of exploring these processes, their interactions, and the representations they engender. To the extent that any particular method may inform theories of cognitive representation or process, it has a place in Cognition.

Unsurprisingly, then, the topic of Cognition is cognition. To be published in Cognition, articles must be robust in respect of the fit between the theory, the data, and the literature in which the work is grounded. They should have a breadth to them that enables the specific research they describe to make contact with more general issues in cognition; the more explicit this contact, the greater the impact of the research beyond the confines of the specialized research community. Thus, articles in Cognition will tend to be distinct from those published in more specialized journals; they will present new perspectives, challenging data, novel methodologies, or a broader interdisciplinary reach. Their experimental and/or theoretical rigour will move forward the frontiers of the science, or significantly constrain the directions in which those frontiers may move. Of course, there will be differences of opinion in respect of which kinds of data and which kinds of theory can best move those frontiers, but such differences help drive that movement. And although authors, reviewers, or editors may subscribe to different theoretical ideologies, this should not be a barrier to publication in Cognition.

Inevitably, the broad scope of the journal encourages a high submission rate (and a correspondingly high rejection rate, climbing last year to close to 85%), and this affords the editors the luxury of selecting only the highest quality articles for publication. The quality and multidisciplinary breadth of the journal is one of the hallmarks of Cognition.

Publishing in Cognition

The purpose of publication is to convey the excitement of our research to others, and through so doing, to influence those others. To exert such influence in one’s field of research is the ultimate academic accolade. But too often we lose sight of that. It is true that tenure is won, and CVs expanded, as a by-product of publication, but first and foremost, publication is about disseminating knowledge. And to do that effectively, articles must be written in the knowledge that others will read them. Ideally, the article should be written so as to grab the imagination of whoever will read it, whether they be a senior colleague in (or out of) the field, a junior researcher, or a student. It should inspire the reader to develop an appreciation of the questions addressed, the methods for answering those questions, and the data and subsequent conclusions to which those methods lead. It is true that there do exist extremely influential articles that are almost unreadable, but Cognition should not be the place for such articles. Articles published in Cognition should be accessible, not just physically (or electronically), but intellectually also. Generally, the more concise an article, and the more readable, the more impact it is likely to have. To this end, the editorial process can help.
Cognition has a published reviewing policy (it can be downloaded at http://ees.elsevier.com/cognit/img/reviewing_policy.pdf). In it, reviewers are reminded that they have a responsibility both to the science and to the authors who are trying to advance that science. This responsibility includes helping authors better their papers and, if necessary, better their science. The role of the editors and the reviewers is as much to reach a consensus on how the author could improve the impact of their research as it is to reach a consensus on whether a paper should be accepted, sent back for revision, or rejected. And if reviewers can suggest alternative, more accessible, ways of ‘packaging’ those hypotheses, or of packaging the data themselves, the review process can better serve the authors. In this regard, reviewers are explicitly asked to consider their role as being more akin to a mentor than to an examiner. Importantly, the role of the editors, as they read each review is not simply to determine whether the paper is acceptable, or to determine which revisions would make it acceptable; it is also to evaluate the quality and fairness of the review (and where necessary, to seek clarification from the reviewer). Unconstructive or confrontational reviews, that lack any substance, are not useful to the review process, and will most likely be queried by the editors. There is nothing wrong with a paper that puts forward an account of the data that does not fit one research group’s or another’s ideological framework. If the data are robust, if the account logically follows, and if that account might usefully advance the field through offering, for example, alternative ways of testing hypotheses, then there is a place for that account and its supporting data in the literature. Similarly, there is a place in the literature for those papers that, in answering the original questions that they set out to answer, leave other questions unanswered. There is much to be said for providing material for future generations of researchers to pursue. And as mentioned earlier, it is this – inspiring others to pick up and run with the seeds of future research – that we should all aspire to as we conduct and disseminate our own research. Scientific advancement is a collaborative process, and at Cognition, the intention is that the review process is a part of that collaboration.

Each submission to the journal will be assigned to an editor drawn from the Associate Editors and the Editor-in-Chief. The editor then determines who should be invited to review each submission, and subsequently makes the final editorial decision to accept, reject, or solicit revisions on the basis of those reviews. The editor’s role is not to provide yet another review, but rather to evaluate the paper in the context of the reviews and to then advise the author(s) on how best to proceed. The Associate Editors also advise the Editor-in-Chief on journal policy (this document, for example, reflects the views of all the editors). Common procedures are implemented across all editors to ensure consistency across the journal.

It is, of course, unavoidable that the review process requires the services of many hundreds of reviewers. 600+ submissions each year (including resubmissions) require that we solicit up to 1800 reviews annually. Add to that the reviews solicited by the other journals publishing in overlapping and related areas, and the reviewing hours each year across the field as a whole reach staggering proportions. It goes without saying that Cognition could not continue as it is without the generosity of its reviewers; if anyone is to be held responsible for the very high quality of the papers published in the journal, it is the reviewers, not the editors. But reviewers (and editors) are only human, and delays incurred during the review process, although regrettable, are rarely due to a breakdown in the review process, but are more likely due to the other commitments of the reviewers from whom the journal solicits its reviews. Very rarely, even the editors take a break; a distributed editorial system – distributed amongst a set of editors sharing a common vision for the journal – softens the impact of the need, occasionally, to fulfill our other obligations.

In the following section, we turn to one final issue; the journal’s policy on the reporting of statistical analyses.

On the appropriate analyses of data

A number of journals that carry articles in the cognitive sciences have specified details of the inferential and descriptive statistics that should accompany empirical data. But different methods yield different response
measures, and in respect of how to report and analyze those measures there is no one size that fits all. This said, most of the parametric statistical techniques used these days are based on the Generalized Linear Model (GLM), of which ANOVA, t-tests, linear and logistic regression, chi-square, and hierarchical loglinear models are examples (with likelihood based inference lying at the heart of all of these). It is not the intention of Cognition to be prescriptive (but see below in respect of the reporting of size of effect and goodness of fit). Nonetheless, there are some broad principles that authors should consider when reporting their statistical analyses. Perhaps the two most important are that different types of response measure generally require different statistical techniques (e.g. different instantiations of the GLM), and that how these measures are reported should reflect the hypotheses that the study intends to test.

With regard to the appropriateness of the techniques, most textbooks provide clear guidelines on which tests are appropriate for the different kinds of response measure (the outcome, or the ‘dependent’ measure) and for the different kinds and numbers of explanatory measures (the predictors, experimental conditions, or ‘independent’ measures). Cognition will require that the appropriate techniques are applied (and that any assumptions underlying these techniques have been satisfied), taking into account the need to establish generalizability across participants and, where appropriate, items. Contrary to many examples in the psychological literature, percentage or frequency data should not be analysed without transformation using ANOVA or related techniques unless it can be shown that the assumptions underlying their use (normality and homogeneity of variance) are satisfied: Logistic regression or related techniques (e.g. chi-square or hierarchical loglinear models) are better suited to data reflecting categorical or contingent outcomes. Importantly, what determines the appropriateness of the analysis is not just the nature of the dependent or the independent measures but also the nature of the hypothesis to be tested.

Some (but generally few) studies are interested in establishing estimates of the mean outcome in one condition or another, and in such cases it is appropriate to report the 95% confidence limits for those estimates. Most studies, however, are concerned with estimates of the difference between means or some other measure of comparison between the conditions; they are concerned with establishing an effect. Graphical depictions of the individual condition means are useful insofar as they enable a quick visual estimate of the magnitude of the effect, but given the emphasis in these studies on comparisons amongst the conditions, it is more appropriate to report the 95% confidence limits for the relevant comparison measures (for example, the difference between the means) rather than to report them for the individual condition means. For complex designs such as those amenable to multi-way ANOVA, confidence intervals can be informative, but again, much depends on the hypotheses being tested.

Many studies are not particularly concerned with the magnitude of an effect, being more concerned instead with merely establishing the effect in the first place. In the case of the multi-way ANOVA, one may care less about the absolute differences across combinations of conditions and more about the fact that differences exist at all; for data amenable to linear regression, one may not care particularly about how steep the slope is, only that there is a slope. And for categorical data, one may care less about the actual odds ratio for one outcome or another across the experimental conditions, and more about whether that odds ratio is different from 1. Notwithstanding this frequent emphasis on effects irrespective of their size, it is desirable to report analyses which describe the size of the effect. However, it is also desirable to report analyses which establish the proportion of variance (or some equivalent) in the outcome measure that is due to the experimental manipulation – the ‘goodness of fit’ of the statistical model. Unless there are reasons why both cannot be reported, Cognition will ask its authors to report both size of effect and goodness of fit measures. Thus, whereas the difference between two means, for example, may be statistically significant, the magnitude of that difference (the size of the effect) does not directly reflect the variance ‘explained’ in the outcome measure (the goodness of fit). Similarly, the slope of a simple regression line indicates the size of the effect, but does not indicate how close each data point is to that line (the standardized slope does, however). Examples of size of effect measures include differences between means, regression slopes, or odds ratios for categorical outcomes. Examples of
measures indicating goodness of fit of the statistical model, and able to reflect proportion of variance explained, include the t-statistic, Pearson’s r, Cohen’s d, and eta squared ($\eta^2$) and its variants (but note that the t-statistic is not as transparent a measure of the goodness of fit as, for example, Pearson’s r, which is why Pearson’s r can be usefully reported in addition to the t-statistic). This is not an exhaustive list, but is indicative of the kinds of analyses that authors should consider if their data permit them. Most statistical packages are able to output both size of effect and goodness of fit measures (although their calculation is not complex).

Finally, the arbitrariness of the .05 alpha level gives the author some flexibility in interpreting a p-value as indicating evidence against the null hypothesis. However, unless converging evidence is presented, effects that only approach this level (e.g. at p<.06 or even p<.1) should be interpreted with considerable caution. Cognition will require its authors to adhere to the convention that an effect described as ‘statistically significant’ must have a p-value below .05 (for better or for worse, this is the current convention). When analysing data across participants and items, authors should consider the implications of finding a statistically significant effect in one analysis, but not in the other – there is no a priori reason why both should be significant, but seeing as most theories published in Cognition pertain to psychological process, it is perhaps more important that the data generalize across participants than across items. However, finding that an effect fails to reach statistical significance across items may reflect a lack of careful control in the items, and this may reflect negatively on the degree of experimental rigor. Thus, we view by-item analyses as being an important method for determining the extent to which the researcher has understood, and where appropriate controlled, the properties of the stimuli that are responsible for the observed effects.

The policies outlined here are necessarily fluid, and subject to constant review. Authors and reviewers are invited to send any comments or suggestions they may have to the Editor-in-Chief.

Gerry T.M. Altmann, Editor-in-Chief, Cognition. February 2007