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## The manuscript assessment

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**R**eviewers are the heart of the peer review system, and no editor can get along without them (1). Reviewers are recruited among the most prominent scientists in the field, but they can be quite inexperienced in reviewing for the scientific journal. Therefore, an important role of editors is to teach the reviewers the communication skills: punctuality, sincerity, professionalism, responsibility, honesty, politeness, use of arguments in disputes, and concentration on detail and clarity (2). In this way, the editors will enable the reviewers to evaluate manuscripts critically but constructively, to prepare detailed comments about the research and the manuscript - all in order to help authors improve their work. Thus, a well-educated reviewer himself becomes an outstanding educator (3).

Very little is known about cognitive aspect of reviewing, and the way this process is performed (3). When reviewing a manuscript submitted for publication, reviewers use different techniques. Most reviewers read and reread the manuscript repeatedly and use the plan as follows (4,5):

The first reading is fast; it serves merely to gain the familiarity with the manuscript, and also to make sure that reviewer is competent for the field the manuscript belongs to. During the first reading the reviewer also gets insight into general idea about the originality of the work, e.g., whether or not the work adds to the knowledge already available, or is it a mere duplicate of an earlier publication. The second reading is also reasonably fast, but more careful than initial reading; it serves to answer the following questions:

- \* Is the research clearly justified?
- \* Is it made credible with appropriate allusions to both scientific principles and the literature?
- \* Is it original?

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If the answers to these questions are positive, the reviewer further assesses the manuscript by the third reading. This time, the reviewer goes to smaller details. His careful analysis of each chapter of the manuscript will help answering the following questions:

- \* Are the hypothesis and objectives clear?
- \* Is the statistical analysis appropriate?
- \* Are the methods presented in full details, so that an interested reader can repeat the experimentation?
- \* Are the results clearly stated and presented in text, tables and figures?
- \* Are the results interpreted accurately?
- \* Is discussion appropriate, not speculative?
- \* Is the cited literature relevant, selective and new?

Therefore, by this reading the reviewer answers the questions the editor poses in the questionnaire to the referee. He always keeps his own paper handy, in order not only to answer by "yes" or "no" these questions, but to give his own comments and suggestions. The reviewer usually faces five types of problems: too much information, too little information, inaccurate information, misplaced information, and structural problems (6). Careful analysis and detailed suggestions on how to solve these problems help both the author and editor to make use of the review and to change the manuscript accordingly.

By the fourth reading, the reviewer considers the organization within paragraphs, the effectiveness of the sentence construction, the format of the text, figures and tables. Is the literature cited properly? It is interesting how many mistakes the authors make when citing the references, although it is usually the easiest chapter to write (7). Annotations should be given according to the page and paragraph. Both the strengths and weaknesses of each chapter should be pointed out.

The fifth reading is used for careful consideration of the readability and style of writing. It is pity that very few reviewers pay attention to this important aspect of the scientific writing; an investigation showed that the review process improves very little the read-

ability of papers (8). It should be remembered that the scientific communication, by definition, is transmission of a clear signal to a recipient, and therefore should be as clear and simple as possible (9). The reviewer is in the position to help authors to improve their professional communication skills even in this regard.

Although it is not the reviewer's role to act as a technical editor, nevertheless he may mark misspellings and correct the grammar. However, he keeps in mind that the reviewer neither rewrites the manuscript for the author nor edits for the editor (4).

Finally, the reviewer analyses his own criticism. He asks himself how helpful, or perhaps prejudiced, he has been, and whether he can support his criticism. After that, he answers the questions in the referee's form (some journals ask their reviewers to use a grading scale for answering the question "To which extent does the article meet this criterion?" the total score is helpful for defining the publishing priority). The reviewer signs his appraisal addressed to the editor; this is a confidential document. He does not sign the report addressed to the author, if the journal is adhered to "blind" review. Finally, he gives his recommendation about acceptance, revision (major or minor), or rejection of the submitted manuscript. This part is also confidential.

Clearly, the assessment of a manuscript is not only a delicate process, but also a time-consuming one. In regard to what makes a good review, it is found that the longer time spent on the task, the better is the review (10). However, no relationship between other characteristics of reviewers and the quality of reviews could be found (11). It seems that there are as many types of good reviewers as there are good reviews. Identifying such persons and educating them to do the job on professional and ethical manner is important duty of editors of the scientific journals.

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