

## Common Errors in Scientific Paper Submissions: A Reviewer's Report

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**ABSTRACT** While research paper writing is turning into a prolific enterprise even in our country, there has never been any stock taking on the nature or number of errors committed by prospective authors. This paper uses a retrospective analysis of available reviewer reports to catalogue common errors identified during refereeing of 50 pre-publication manuscripts in the form of original research papers submitted to 7 indexed journals. With the available reviewers' reports, a comprehensive listing of the common errors was carried under each section of a typical research paper. Results indicate 167 types of errors (Mean: 3.34) equaling 1476 number of errors (Mean: 29.5). The greatest types of errors in the reviewed manuscripts were under the section on method (21/167: 12.6 %), followed by those under data analysis (17/167: 10.2%), improper use of grammar-semantics-syntax (15/167: 9.0 %), and so on. Contrast this with most number of errors under data analysis (184/1476: 12.5 %), method (179/1476: 12.1 %), references (156/1476: 10.6 %) and others. In relation to the disciplines reviewed, highest types and number of errors were found in journals of special education, followed by those in speech-hearing and least in journals of psychology. A content wise comprehensive catalogue of common errors is presented with illustrative examples before the implication of these findings and they are discussed in the context and need for carrying out periodic academic authorship training and continuing research education programs for reviewers as well as research writers in the field of humanities-social sciences.

### INTRODUCTION

Researchers work intensely to prepare original research papers to successfully face peer review process and getting them published in standard journals (Babbie 2012). The papers are typically received at the editorial office crafted according to the mandated 'instructions to authors'. After receipt of a contribution, the editor screens the manuscript by suitability, content, rules, journal policy, format and framework (Devers and Frankel 2001). If suitable, the editor moves the paper to the next step of pre-publication peer review (Day and Gastel 2011). The reviewer's job is equally unenviable. Unshaken by any conflict of interests and guided by scientific objectivity, the reviewer is expected to impartially detect shortcomings (if any) in the paper before conveying a decision or offering corrective recommendations thereof (Shatz 2004).

Despite a line of argument demanding its elimination, some journals retain the procedure of single or double blind peer review to reduce or eliminate bias (Berger 2006; Smith 2006). There is no unanimity among reviewers and editors on what constitutes peer-review process. For some,

quality implies originality, design, conclusions, presentation and documentation. For others, it means structural aspects, importance, or interest in the topic of study (Jefferson et al. 2002). At the end of a review, a simple arbitrary prescription on Likert scale maybe provided as 'excellent', 'very good', 'satisfactory', or 'poor'. Unfortunately, many journals have no 'instructions to reviewers' as they prescribe for 'authors' (AMA 2007; Lebrun 2007; Ballenger 2006; Day 2006; Amato 2002; APA 2001).

At some stage, every author is challenged by various observations received from reviewers. The comments or criticisms may be that the submission lacks proper structure or details for readers to understand the presentation. It could be that the given references are not up-to-date, or that there are insufficient details on materials and methods. There may be objections to the research design or statistical applications (Strasak et al. 2007). There might be complaints on poor language quality, erroneous citations (Walter et al. 2003), the tables or figures being far too many or difficult to read (Durbin 2004) or that they have parts that require explanation (Sandman et al. 1985). Clark and Mulligan (2011)

identified 15 common mistakes in clinical research, such as, failure to critically review prior research, not specifying inclusion/exclusion criteria for subject selection, or not giving exact statistical assumptions in the analysis, not determining and reporting the error in measurement, etc. Such findings are supported by others (Lok et al. 2001).

While research writing as part of social-behavioral sciences is a prolific enterprise even in our country as evidenced by the several available texts, bibliographies and compendiums on various subjects (Venkatesan and Vepuri 1994); so far, no stock taking has ever been attempted on the nature or kinds of errors committed by prospective authors seeking to publish their research papers in standard Indian journals. What are the common errors committed by prospective researchers during their technical writing of research papers in the area of social sciences? Are the errors to do more with form, frequency or content of the paper writing? What may be the common grounds on which prepared research manuscripts may face the threat of rejection by peer reviewers? Such research questions need and justify an exploration on the common pitfalls in research writing. The findings may likely alert potential researchers to avoid such mistakes.

Under these circumstances, it was the objective of this paper is to catalogue common errors identified during refereeing of submitted manuscripts on scientific writing for publication in standard journals in the field of humanities-social sciences by the prospective authors.

## MATERIAL AND METHODS

The present paper uses a retrospective analysis of available reviewer reports with the author on scientific research writings sent for publication in standard indexed journals. The au-

thor is on the panel of reviewers for several journals in the field of humanities-social sciences. For over two decades, the accumulated and available copies of reviewer reports with the author gave an occasion and opportunity for drawing the final sample of 50 original research papers covering 7 standard accredited and indexed academic journals, which was subjected to error analysis. Other available review reports on pre-doctoral, doctoral thesis, book reviews and test reviews were excluded from the purview of this paper (Table 1).

An original research paper, as operationally defined, refers to that form of academic communication by writing (usually 10-15 pages) as composed by investigators and containing results of new research or an evaluation of research already conducted by others. The data collection point was the perusal of contents in the already available review reports with the author and which had gone to editors of the respective journals where the manuscripts were submitted for publication. All review reports were considered irrespective of the eventual decision or recommendation in favor of acceptance, modification and/or rejection for publication in the journal. Errors, flaws, pitfalls or slip ups as recognized refers to 'an act or condition of unintentional, ignorant or imprudent deviation from accuracy or agreed specification of requirements of an expected code of behavior' (Corder 1973). The cause of error is recognized as a fault while its consequence is a failure.

The primary data units in this paper are the types (Table 2) and numbers (Table 3) of errors (abbreviated as TE and NE), consolidated by compiling verbatim all the original review reports with their corresponding pre-publication manuscripts as research papers. This was followed by data classification, categorization, and cataloguing via identification and sorting of various

**Table 1: Sample journals included in the study**

<i>S. No.</i>	<i>Title of journal</i>	<i>ISSN number</i>	<i>Periodicity</i>	<i>Area of specialty</i>
1	Indian Journal of Clinical Psychology	0303-2582	Half Yearly	Clinical Psychology
2	Indian Journal of Psychology	0976-4224	Half Yearly	Psychology
3	Psychological Studies	0033-2968	Half Yearly	Psychology
4	Journal of Indian Speech and Hearing Association	0974-2131	Half Yearly	Speech and Hearing
5	Journal of All India Institute of Speech and Hearing	0973-662X	Yearly	Speech and Hearing
6	Journal of Disability Management and Special Education	2229-5143	Half Yearly	Special Education
7	Disability, CBR and Inclusive Development Journal	2211-5242	Half Yearly	Disability Rehabilitation

**Table 2: Illustrative glossary on errors across audited journal submissions**

<i>Serial</i>	<i>Error zone</i>	<i>Nos.</i>	<i>Types of errors</i>
A	<i>Title</i>	1	Acronym used
		2	Too lengthy (more than 15 words)
		3	Inappropriate
		4	Running title NOT given
		5	Absence of scholarliness
		6	Key words NOT given
		7	Repetition of key words as given in title
B	<i>Abstract</i>	1	Incomplete
		2	Beyond the prescribed word limits
		3	NOT written in prescribed format
		4	Use of several abbreviations
		5	Use of references or citations
		6	Improper grammatical forms for expression, tense or voice
		7	Negative findings NOT included
C1	<i>Introduction</i>	8	Use of meaningless expressions
		1	Get excessively into the basics
		2	Too lengthy
		3	Does NOT logically percolate into building research questions, hypothesis, need or rationale for the study
		4	Faulty ordering or sequencing within running text that is misshapen, haphazard or arbitrary
		5	Laundry list of references/citations without carrying out their synthesis or critical evaluation
		6	Citation of references in parenthesis with the name, professional qualifications and initials of authors
		7	Use of the same first sentence under this section as phrased under abstract
		8	Sub-titling this section separately when it was NOT called for
		9	NOT presenting all sides of argument
C2	<i>Review of Literature</i>	10	Presentation of ideas without citation
		1	Fails to examine or critically evaluate literature for similar or prior research
		2	Recent literature NOT cited
		3	Citations NOT related to main theme of current study
		4	States only secondary sources with minimum or absent primary sources
C3	<i>Need, Rationale or Justification</i>	5	Does NOT set the stage for derivation of hypothesis
		1	NOT enunciated or specified for the study
		2	Non-availability of related studies in the country cited as sole criteria for study
C4	<i>Theoretical Framework</i>	3	Research questions NOT raised or specified
		1	NOT identified, matched, sufficiently explained, mentioned or deduced
C5	<i>Statement of Problem</i>	2	Delimitation of the study NOT given
		1	NOT given either in question format or as declarative statement
		2	Rationale and directionality of stated hypothesis NOT mentioned
		3	Apriori statement or description of null-hypothesis under investigation is NOT given
		4	Statistical as well as scientific hypothesis under investigation NOT pre-specified and explicitly mentioned
C6	<i>Aims, Objectives and Outcomes</i>	5	Wherein there is no pre-specified hypothesis, the exploratory character of the study NOT outlined adequately
		1	NOT distinguished or stated adequately
D	<i>Method</i>	1	Inclusion/exclusion criteria NOT enunciated/specified
		2	Time frame or time lines NOT given/mentioned
		3	Research design NOT mentioned

**Table 2: Contd...**

<i>Serial</i>	<i>Error zone</i>	<i>Nos.</i>	<i>Types of errors</i>
		4	Does NOT describe how extraneous variables were controlled
		5	Operational definitions NOT postulated at all
		6	Confusing nominal and conceptual definitions for operational definition
		7	Identification of key variables or defining their relationships NOT undertaken
		8	Nature, type, size of target sample or population NOT identified
		9	Subject recruitment details NOT given
		10	Source of subjects NOT mentioned
		11	Power analysis to determine appropriate size of sample needed for study NOT undertaken
		12	Report on withdrawals from the study NOT given
		13	Report on use of randomization in a controlled trial NOT given
		14	Method of randomization, when carried out, is NOT clearly stated
		15	Rationale for selection of a particular sampling technique NOT given
		16	Showing no statistically significant difference at baseline to conclude equivalence between study groups
		17	Does NOT report initial equality of baseline characteristics and comparability of the study groups
		18	Statistical procedures in place for establishing equality of baseline characteristics NOT given or appropriate
		19	Ethical issues NOT addressed
		20	Inter observer reliability measures where applicable NOT reported
		21	Adequate bias control measures NOT implemented
<i>E1</i>	<i>Procedure</i>	1	Step-by-step description of how data was collected NOT given
		2	Response rates for mail surveys NOT calculated
		3	Procedures used for handling non-respondents or to combat attrition NOT mentioned
		4	Observers, coders, examiners or data collection agents NOT trained or no reports given thereof
<i>E2</i>	<i>Tools</i>	1	Rationale for choice or source of tools NOT given
		2	Their description in terms of structure, content, administration, scoring and interpretation NOT given
		3	Psychometric properties of chosen tools connected references NOT given
		4	Units of measurement and/or data units are NOT stated or clarified
		5	Error components, if any, on the used measurement tools/methods NOT given
		6	NOT adapting the use of foreign tools or antiquated tests on native subjects
		7	Test details NOT given in relation to the purpose for which it is being used
<i>E3</i>	<i>Data Analysis</i>	1	NOT differentiating between 'raw' data and 'converted' data while reporting
		2	NOT examining normality of the derived data
		3	NOT reporting missing data, dropped subjects, and/or carrying out an attrition analysis
		4	NOT conducting intent-to-treat analysis
		5	NOT undertaking or reporting about data cleaning processes and procedures
		6	Statistical test used is NOT compatible with type of data examined
		7	Indiscriminate or wrong use of statistical tests

**Table 2: Contd...**

<i>Serial</i>	<i>Error zone</i>	<i>Nos.</i>	<i>Types of errors</i>
		8	NOT performing statistics on raw data or actual obtained values but on derived values
		9	NOT applying statistical analysis based on the probability distribution of obtained data
		10	Paired t-test used for unequal sample sizes or use of an unpaired t-test for paired data or vice versa
		11	NOT specifying exact statistical assumptions made for the analysis
		12	Making faulty statistical inferences such as, correlations interpreted as causation
		13	Using simple correlation where partial correlation or multiple correlation is needed
		14	Use of multiple statistical tests (e.g., t-tests, ANOVAs) thereby increasing possibility of making a Type 1 errors
		15	Non-use of exact tests or the use of chi-square tests for expected cell counts <5 without a Yates-correction
		16	Failure to anticipate regression towards the mean
		17	Erroneous comparisons made based only on P-values
<i>F</i>	<i>Results</i>	1	NOT providing data that answers the research question
		2	Adding interpretations to the findings
		3	Failure to address the inferential statistics used in the method section
		4	Reporting results selectively
		5	NOT addressing narrative and statistical findings equally
		6	Rendering the results into a menu card list of quantitative findings without any narration
		7	Giving improper statements like 'result are given in table 1 or 2' without supplementing with narration
		8	If narrative given, it makes no sense if read after the tables, charts or graphs are removed.
		9	Giving mean and standard deviation values instead of median, range or inter quartile range for non-normal distributions
		10	Reporting means without accompanying details on N and standard deviations
		11	Conversely, giving means and standard deviations while applying non-parametric tests for data analysis
<i>G</i>	<i>Discussion</i>	1	'Non-significant' misinterpreted as 'no-effect' or 'no-difference'
		2	Presenting/interpreting numerical data with high precision
		3	Overstating the findings
		4	Dividing and interpreting continuous data into ordinal categories without explaining why or how it was done
		5	Drawing conclusions under section on discussion
		6	NOT comparing ones result with current literature on the same topic
		7	NOT invoking the use of conflicting reports and rather reporting only studies favorable to ones findings
		8	Assuming that a correlation between pieces of data is proof for cause-and-effect relationship
<i>H</i>	<i>Conclusions</i>	1	Section missing
		2	Confusing sections between 'results', 'conclusions' and 'implications'
		3	Over-generalizing the results
		4	Does NOT highlight the weaknesses in the study
		5	Faulty use of strong statements of conviction rather than conjecture
<i>I</i>	<i>References</i>	1	Incomplete, faulty or absent references although cited in text or vice versa
		2	Citations NOT drafted according to journal policy or instructions to authors

**Table 2: Contd...**

<i>Serial</i>	<i>Error zone</i>	<i>Nos.</i>	<i>Types of errors</i>
		3	Mention of references which are unpublished, outdated or inaccessible for most readers
		4	Carry first as well as second names of authors
		5	Inconsistent use of and-ampersand
		6	Use of series parenthesis
		7	NOT arranged in alphabetical or chronological order
		8	Spelling errors
		9	Articles from world wide web NOT suffixed with date of retrieval
		10	Missing details like comma, italics, spacing and/or full stops in the references
<i>J</i>	<i>Tables and Graphs</i>	1	Distinction NOT made between tables, graphs, flow diagrams and figures
		2	Tables incomplete, far too many, titled inadequately, or NOT numbered sequentially
		3	Contents or information across tables repeated
		4	Unnecessary elaborations
		5	Missing legends in figures and graphs
		6	Pie charts to show distribution of a continuous variable
<i>K</i>	<i>Abbreviations</i>	1	Use without expansion even at first time appearance
		2	Multiple use of expansion after its first use with acronym
		3	Use in inappropriate places like abstract
		4	Use of abbreviations NOT in the official list
<i>L</i>	<i>Grammar</i>	1	Use of long compound or complex sentences, missing or unsuitable words, wrong grammar, ambiguous statements
		2	Use of wrong plural
		3	Incorrect or mixed use of tense
		4	Use of un-English words
		5	Use of blend words without hyphenation
		6	Unwanted capitalization of words in running sentence
		7	Use of contractions
		8	Inappropriate use of apostrophes
		9	Use of unspecific determinants
		10	Use of an inflated writing style and ornamental trappings of scholarship
		11	Use of strong words in place of mild ones
		12	Use of imprecise terms
		13	Use of vague expressions
		14	Use of personal pronouns to be eliminated
		15	Nominalization
<i>M</i>	<i>Typological</i>	1	Spelling errors
		2	Commonly confused words
		3	Unwanted and irrational use of lower and upper cases in running text
<i>N</i>	<i>Organization</i>	1	Gross sequencing errors
		2	Use of uncalled for long quotations
		3	Unequal or disproportionate bulges between various sections/sub-sections in the article
		4	No numbering given to pages
		5	Chaotic structure in article
		6	Paper length exceeds stipulated word/page limits
		7	Manuscript does NOT follow the journal's 'instructions to authors'
		8	Poor paragraphing
<i>O</i>	<i>Terminology</i>	1	Replacement of standard terms
		2	Use of terms in first person
		3	Arbitrary use of technical terms
<i>P</i>	<i>Plagiarism and Fair Use</i>	1	Self plagiarism
		2	Cut and copy of passages from net
		3	Copyright issues NOT addressed
		4	Source NOT mentioned

**Table 3: Distribution of errors across audited journal article submissions**

S. No.	Error domain	Overall (N: 50)			Field of journal								
		TE (1)	NE (2)	NA (3)	Psychology (N: 25)			Special education (N: 12)			Speech-hearing (N: 13)		
		TE (1)	NE (2)	NA (3)	TE (4)	NE (5)	NA (6)	TE (7)	NE (8)	NA (9)	TE (10)	NE (11)	NA (12)
A	Title	7	42	13	3	11	4	5	18	6	4	13	3
B	Abstract	8	82	16	3	34	5	4	31	6	2	17	5
C	1 Introduction	10	62	14	6	24	3	8	27	7	7	11	4
	2 Review of Literature	5	83	18	4	33	5	5	24	7	5	26	6
	3 Need, Rationale and Justification	3	17	9	3	4	3	3	10	4	2	3	2
	4 Theoretical Conceptual Framework	2	22	15	2	9	4	2	8	8	2	5	3
	5 Statement of Problem	5	48	20	4	17	7	4	19	7	4	12	6
	6 Aims, Objectives and Outcomes	9	12	1	3	3	1	4	5	1	2	4	
D	Method	21	179	27	15	78	12	15	56	9	13	45	6
E	1 Procedure	4	44	18	4	10	4	4	15	7	4	19	7
	2 Tools/Instrumentation	7	66	26	5	16	9	4	19	8	5	31	9
	3 Data Analysis	17	184	34	12	71	15	14	52	9	13	61	10
F	Results	11	144	26	7	64	11	9	43	7	7	37	8
G	Discussion	8	33	12	3	12	5	4	14	5	4	7	2
H	Summary, Conclusions and Implications	5	22	6	2	7	2	3	10	3	3	5	1
I	References	10	156	27	9	78	14	10	48	8	10	30	5
J	Tables and Graphs	6	73	21	4	14	6	6	31	7	5	28	8
K	Abbreviations and Acronyms	28	12	2	9	3	3	10	4	3	9	5	
L	Grammar-Semantics-Syntax	15	124	23	11	45	8	14	47	7	12	32	8
M	Editing, Proof Reading and Typing Errors	3	14	9	1	5	2	2	4	4	2	5	3
N	Organization	8	32	14	4	9	4	7	16	5	5	7	5
O	Terminology	3	6	3	1	2	1	2	2	1	1	2	1
P	Plagiarism and Fair Use	4	6	4	1	1	1	2	2	2	3	3	1
	Total	167	1476	50	107	556	25	131	510	12	117	410	13
	Mean Errors per Article	3.3	29.5		4.3	22.2		10.9	42.5		9.0	31.5	

(TE: Type of Errors; NE: Number of Errors; NA: Number of Articles; Figures in parenthesis indicate column numbers)

errors in the corpus as against the structural components and categories expected or prescribed for typical scientific research submissions (APA 2010; Bem 2004; Branson 2004). The chosen error zones of a typical research paper are: title, abstract, introduction, method, procedure, results, etc. Thus, for example, under 'title', the common types of errors found on mapping were use of acronyms, too lengthy or inappropriate titles, having no provision for running titles, and/or not giving keywords. Similarly, the common errors under other sections were also identified and listed. The errors were eventually subjected to statistical analysis in terms of frequency counts and percentages.

## RESULTS

The consolidated results on type, pattern and frequency of errors seen in the reviewed manuscripts of research papers are presented in three distinct but interconnected headings: (i) Overall Error Patterns; (ii) Error Profiles between Disciplines of Journals; and, (iii) Error Zones within Papers.

### (i) Overall Error Patterns

On the whole, for 50 paper submissions across 7 peer reviewed journals covered, the results indicate 167 types of errors (Mean: 3.34)

equal to 1476 number of errors (Mean: 29.5) per paper covering almost all sections/sub-sections of a research paper. The greatest types of errors were in the sub-section on method (N: 21/167: 12.6 %), followed by those under data analysis (N: 17/167: 10.2%), improper use of grammar-semantics-syntax (N: 15/167: 9.0 %), and so on. Contrast this with most number of errors seen under data analysis (N: 184/1476: 12.5 %), method (N: 179/1476: 12.1 %), references (N: 156/1476: 10.6 %) and others.

### (ii) Error Profiles between Disciplines of Journals

In relation to the discipline of manuscripts surveyed, the highest variety and content of errors were found in journals of special education (N: 12; TE: 131; Mean: 131/12: 10.9; NE: 510; Mean: 510/12: 42.5), followed by errors in journals of speech-hearing (N: 13; TE: 117; Mean: 117/13: 9.0; NE: 410; Mean: 410/13: 31.5) and least in journals of psychology (N: 25; TE: 107; Mean: 107/25: 4.3; NE: 556; 556/25: 22.2). Irrespective of the discipline to which surveyed manuscripts were reviewed, most errors are related to sections on data analysis, method, references, results and grammar-syntax-semantics, in the same order. A content wise comprehensive catalogue of common error in manuscripts (Table 3) reveals segment wise shortcomings in the reviewed manuscripts.

### (iii) Error Zones within Papers

Based on the typical anatomy of a journal paper, 16 major zones (including 6 sub-sections for introduction and another 3 sub sections under procedure) were mapped for in depth analysis to list various types and examples of errors in the reviewed manuscripts. They are:

#### A. Title

The title of a paper is expected to adequately describe the main theme and content of the paper in fewest possible words, in accurate, unambiguous, specific, and complete terms. Many submitted papers had to be suggested to shorten title length within recommended words limit, eliminate redundancy by cutting down extra words like 'a study of ...', 'an analysis of ...', or 'an investigation of ...'. A few had to be cau-

tioned against use of acronyms in titles. Many submissions were without running titles and key words, or if present, they carried the same words under both. Some titles attempted to be dramatic, funny, educational or metaphorical, such as, 'A wish and a prayer ...', 'An arrow in the dark ...', or 'An end of the tunnel..'. However, such titles could not be allowed at the expense of their not being scholarly.

#### B. Abstract

All journals insist on abstract with words limit to reflect accurately and concisely the contents of a research paper. The abstract may be structured or unstructured. It forms a synopsis of the paper to convey its most important objectives, methods, data and conclusions. There are prescribed dos and don'ts on or against use of acronyms and citations in an abstract. The tense, voice, language, semantics and use of certain grammatical forms or phrases in abstract is well regulated (Swales and Feak 2009; Alexandrov and Hennerici 2007; Cummings et al. 2004). Common errors elicited in this section were abstracts being lengthy, inaccurate, not being written in prescribed format, giving references, using abbreviations or adjectives, superlatives and personal pronouns. Some used meaningless expressions like 'results are provided' or 'discussion follows'. A few made no mention of negative findings.

#### C. Introduction and Review of Literature

This 'background' section is the foundation for any research paper. Although some authors prefer a long 'introduction', the ideal prescription is to confine this section to 2-3 paragraphs. It is not necessary to highlight every paper on the topic in the introduction. Mention of important work is sufficient before percolating to the problem and listing unresolved issues. The final paragraph describes the need or rationale for the present paper before mentioning key research questions and/or hypothesis. An introduction can be elaborate if the reader needs to be educated on the chosen topic. However, the minimum scholarship expected of the typical reader of a professional journal in any specialty must be recognized and respected before elaborating on basics in the chosen topic (Galvan 2009).



Some common faults elicited were the tendency to get excessively into basics, thereby enlarging this section with repetitions beyond a third of the total length of the research paper. The contents of this section must elaborate and logically percolate into building the research questions, hypothesis, need or rationale for the paper. This was not found in many of the reviewed manuscripts. Non availability of related studies in the country was cited as sole justification for the paper. Further, as required, many manuscripts made no reference or mention of the theoretical/conceptual underpinnings even wherein non-exploratory or confirmatory type of research was undertaken. Even if mentioned, they were mismatched or they were not sufficiently explained or deduced.

The *statement of problem* is a significant component at the end of introduction in any research paper. It outlines the scope of the paper or delineates its delimitation either as declarative statements or in question format. This is done by identifying key variables, indicating their relationships in terms of target populations and setting the stage for derivation of hypothesis. Many of the reviewed manuscripts reflected shortcomings on all these aspects. Wherein occasionally a hypothesis was stated between variables, their rationale, direction, clear apriori statement or description of null hypothesis was not mentioned. A distinction between statistical and scientific hypothesis under investigation remained without pre-specification or explicit mention. Wherein there was no pre-specified hypothesis, the exploratory character of the paper was not outlined adequately.

A culmination of the section on 'introduction' is *statement of aims, objectives and outcomes* expected of the paper. Aims are generic statements written in broad terms of what or how the researcher sets out to achieve in the chosen area of research. Objectives are more specific statements of the research aims expressed as observable and measurable outcomes within an achievable or realistic time frame. It is not uncommon to have more than one objective to satisfy a research aim. Of course, both the aims can also be inter-related. Outcomes are statements of what one might in principle assess. The reviewed papers made no distinction between aims, objectives and outcomes or did not state them adequately. Where objectives need to be stated using strong verbs, such as, 'to collect,

construct, classify, develop, devise, measure, produce, revise, select, or synthesize', some papers used weak verbs like 'to appreciate, consider, enquire, learn, know, understand, be aware of, appreciate, listen or perceive'. Sometimes, they were also stated in tautological, vague or un-testable manner.

The sequencing of this section was found to be arbitrary in some papers. There were uneven bulges at the beginning, middle or end of this section. A few papers presented the review of literature like a sequential or chronologically arranged laundry list of references on the chosen topic without carrying out their synthesis or critical evaluation. Other shortcomings included citation of references in parenthesis with name, academic qualifications as well as initials of authors in running text, using the same first sentence under this section as phrased under abstract, sub-titling this section (such as, 'introduction', 'review of literature' or 'statement of problem') when not called for or not presenting all sides of the argument. Sometimes, ideas were presented or statements enunciated without appropriate citations, write-ups relied only on secondary rather than primary sources or there was complete absence of recent research citations.

#### **D. Method**

This section describes how the study was conducted or how it seeks to answer research questions, refute or support the stated hypothesis. Some journals permit structured methods section with sub-headings, such as, research design, operational definitions, sample, participants, tools, procedure and statistical techniques. Each section best describes that aspect of the study being reported. In addition, the subsection on subjects include details on nature (normal volunteers, patients or animals), procedures of subject recruitment, inclusion/exclusion criteria, demographic characteristics (age, gender, education, diagnosis or socio-economic status), experimental-control groups (if any), and a clear statement on adherence to ethical guidelines (Venkatesan 2009).

An error analysis of this section showed glaring omissions in enunciating inclusion/exclusion criteria, research design, time frame or timelines of the study. Some studies did not explain how extraneous variables were controlled or why

a particular research design was chosen. A few studies made indiscriminate, arbitrary or no use of technical procedures like 'control group', 'randomization' or 'double blind' without exactly reporting, for example, who or what was blinded (parents, data assessor, patients or statisticians!). Some were without details on the nature, type or size of sampling, rationale for selection of a particular sampling technique, source or manner of subject recruitment, procedures used for randomization in controlled trials and/or sample withdrawals if any. Dillman (2000) calls attention to four possible sources of error in sample survey research, all of which constitute a threat to external validity: sampling error, coverage error, measurement error and non-response error. A major flaw observed across submissions was failure to consider a-priori effect and make sample size estimation/analysis before start up of the investigation to determine or make sure that the study is provided with sufficient statistical power to detect treatment effects under observation and to avoid possible type II errors. In other words, no a priori sample size calculation/effect-size estimation (power calculation) was carried out to determine the appropriate size of sample or number of subjects needed for the study. Many studies informed that there are no statistically significant differences between study group samples at baseline and concluding that the groups are equivalent even when sample size was small and lacking in statistical power. Some did not attempt to report initial equality of baseline characteristics and comparability of experimental-control group or used inappropriate or no statistical procedures for establishing their equality in terms of baseline characteristics.

### ***E. Procedure***

A diagrammatic flow of procedures and protocols used in the study with a timeline can be instructive for prospective researchers who wish to replicate the study. Among the flaws detected in the reviewed manuscripts, ethical issues were not addressed, inter-observer reliability measures where applicable was not reported, adequate bias control measures were not implemented, step-by-step description of how data was collected was not enunciated, procedures used for handling non-respondents or to combat attrition was not mentioned, response rates

for mail surveys were not calculated, observers or data collection agents were not trained or no reports were given for surveys and observation studies.

Wherein *tools or tests* are used, it is imperative to name the instrument and cite its source, explain the rationale for its selection, delineate its structure or procedure of administration, scoring, interpretation and psychometric properties. However, most of these requirements were violated. Additionally, many studies made indiscriminate use of foreign tools or antiquated tests on Indian subjects in native language without revalidating, readapting or attempting reverse translation. Wherein, occasionally, reliability, validity, sensitivity, cultural/ecological adaptation and norms of the tools (if any) were reported, they were not stated in relation to the purpose for which they were used or were unaccompanied by related references. Statements on units of measurement and/or data units of the research study were not mentioned.

The sub-section on *data analysis*, a challenge to authors, describes 'how data was handled, what statistical tests were done, and what p value was deemed to indicate statistically significant difference' (Branson 2004). The need, justification and appropriateness in the use of specific statistical tests for data analysis may be given. For this sub section, many reviewed papers made no distinction between 'raw' data and 'converted' data while reporting. Data cleaning as a necessary process to ensure that all data taken into the study are eventually reduced to a correct form by detecting and fixing errors in database without any missing information, double entries, duplicate or inconsistent data was seldom addressed. No attempt was made to analyze or report missing data, dropped subjects, and/or carry out attrition analysis. The usual on-protocol or per-protocol analysis must replace with what is called as 'intent-to-treat analysis' wherein drop out cases can be as much important or meaningful for final analysis as those who get included in the study. The exact assumptions made for statistical analysis remained unspecified often leading to incompatibility between the statistical test used and data examined. For example, paired t-test was used for unequal sample sizes and unpaired t-test for paired data. Other noticeable statistical errors were use of wrong statistical tests or simple correlation techniques in place of partial or multiple

correlations to get a clear picture on the way variables operated. Some papers made no use of exact tests or they used chi-square tests for cell counts less than 5 or for small samples without Yates-correction, applied chi-square on percentages, converted or derived data rather than upon raw data or used non-parametric tests indiscriminately like Mann-Whitney U test (to be used for 2-group case) or Kruskal-Wallis test (to be used when 3 or more groups are compared). Many studies failed to examine the normality of derived data in spite of which strong parametric statistical tests or even multivariate analytical procedures were used. Such attempts with practices like not applying statistical analysis based on probability distribution of obtained data as in the case of using multiple tests (for example, t-tests, ANOVA) increased the possibility of type I errors (that is, rejecting null hypothesis when it is true). Further, there were instances of faulty statistical inferences, such as, correlations interpreted as causation, claiming statistically significance for weak correlations or making erroneous comparisons based only on P-values or failure to anticipate regression towards mean. Sometimes, data analysis got into fallacies like dividing continuous data into ordinal categories without explaining why or how it was done. For example, continuous data, such as, height measured in centimeters was erroneously separated into two or more ordinal categories like short, normal and tall. Many of these shortcomings in application of statistical techniques have been lamented even in medical journals (Lang 2004; Altman 1998; White 1979; Gore et al. 1976; Schor and Karten 1966).

#### **F. Results**

Ideally, this section simply states findings without bias or interpretation. Timeline of the study, tables and graphs get into this section. This section is to be written in past tense. Major faux pas in this section included, not providing data that answers the research question, adding interpretations to findings, failure to address inferential statistics used in method section, reporting results selectively (such as, percentages without frequencies or p-values without measures to that effect), not addressing narrative and statistical findings equally, rendering results into a menu card list of quantitative findings without any narration, giving improper state-

ments like 'result are given in table one or two' without supplementing with narration. If a narrative is indeed given in this section, it must make sense to a reader even if it is read after the tables, charts or graphs have been removed. Other common errors while reporting statistical results in this section were giving mean and standard deviation values instead of median, range or inter quartile range as required for non-normal distributions, reporting means without accompanying details on N and standard deviations especially when parametric tests were used for data analysis, or conversely, giving means and standard deviations while applying non-parametric tests for data analysis.

#### **G. Discussion**

The *discussion* is the place where results are interpreted (Docherty and Smith 1999) before making conclusions in next section. All interpretations need to be carried out cautiously and correctly. The most common mistakes seen were drawing 'conclusions' in this sub-section, overstating findings, misinterpreting 'non-significant' as 'no-effect' or 'no difference', seeking to present numerical data with high precision (such as, multi digit decimals of 2.2356 instead of rounding it to two decimal places or 25.3567 as 25.3), dividing and interpreting continuous data into ordinal categories without explaining why or how it was done (as in continuous data of height measured in centimeters is erroneously separated into two or more ordinal categories like short, normal and tall), not comparing ones result with current literature on the same topic, not invoking use of conflicting reports and reporting only studies favorable to ones findings, assuming that correlation between pieces of data as proof for cause-effect relationship, etc.

#### **H. Conclusion**

This section is not expected to reiterate what is already said under results or discussion. All statements under this section should be in the tone of a conjecture rather than conviction. For example, it would be apt to state '...though the differences between the treatment groups was statistically significant, there are grounds to suspect that the difference will not ...' Rather than concluding that the hypothesis is true or that it has been proved or disproved, it would

be better to say that the evidence supports the hypothesis or is consistent (or inconsistent) with the hypothesis. This section also indicates what research questions need to be raised or answered next. Many reviewed manuscripts did not have a section on 'conclusion' at all. Where present, a few papers confused between 'results', 'conclusions' and 'implications', over-generalized the results, or did not use the opportunity to highlight the weaknesses in the study.

### ***I. References***

This was one of most frequently flawed portions of the reviewed manuscripts. The recurrent mistakes in this section were incomplete, faulty or absent referencing although cited in text or vice versa. Citations were not drafted according to journal policy. The given references were outdated or inaccessible. Some references carried first and second names of authors, used and-ampersand inconsistently, cited unpublished works or used series parenthesis '(Davies1999) (Table 2)'. A few manuscripts did not arrange references in alphabetical or chronological order, had spelling errors (Jersey as Jersea), mentioned retrieved papers from world wide web but not suffixed with date of retrieval, had missing details like comma, italics, spacing and/or full stops in the references, etc. Lukic et al. (2004) assessed three anatomy journals to discover similar citation errors in 27% (54/199 papers) of the references and 38% of them were notified as 'major' errors, which called for serious editorial action.

### ***J. Tables, Graphs, Flow Diagrams and Figures***

Many reviewers insist on a clear distinction between tables, graphs, flow diagrams and figures (Durbin 2004). This difference blurred in some reviewed manuscripts. Sometimes, tables were incomplete, far too many, titled inadequately, or NOT numbered sequentially. The contents in the table were repetitive of the information already given in graphs or text. Some gave unnecessary elaborations (such as, 'see figure one' instead of simply 'figure one), figures or graphs had missing legends, or made use of pie charts to show distribution of a continuous variable.

### ***K. Abbreviations-Acronyms***

The use of acronyms without their expansion for its first appearance, their multiple uses with repeated expansion, their use at inappropriate places like abstract, or the use of abbreviations not given in official lists were some common errors culled from the reviewed manuscripts.

### ***L. Grammar-Semantics-/Syntax***

Science research writing is a challenge for most non-native speakers of English (Glasman-Deal 2010). The linguistic errors seen in the reviewed manuscripts were use of long compound or complex sentences and phrases, missing or use of unsuitable words, wrong grammar or plurals (such as, 'abuses' for 'abuse'), ambiguous statements, vague expressions (such as, 'it has long been known that ..'), incorrect or mixed use of tense (such as, 'several interviews were conducted to substantiate the hypothesis ..' instead of 'we carried out several interviews ...'), un-English words (such as, 'worthwhileness', 'attentional processes' or 'parental interviews'), blend words without hyphenation (such as, 'presymbolic' 'decentered', 'sensorimotor', 'nonliteral'), unwanted capitalization of words in running sentence, the use of contractions (such as, can't, don't, won't, isn't, wasn't), inappropriate use of apostrophes, use of strong words in place of mild ones (such as, 'possess' for 'have', 'sufficient' for 'enough', 'utilize' for 'use', 'demonstrate' for 'show', 'assistance' for 'help', 'terminate' for 'end'), imprecise terms (such as, 'prior to' for 'before', 'due to the fact that' for 'because', 'the vast majority of', for 'most', 'during the time that' for 'when', 'in close proximity to' for 'near'), unspecific determinants like 'very', 'super', or inflated writing style and ornamental trappings of scholarship. A few papers used personal pronouns, modal verbs (such as, 'should', 'must') and nominalizations (such as, 'to work' instead of 'to do some work' or 'to investigate' instead of 'to make an investigation'). The use of apt terms gathers greater significance in research paper submissions especially in fields of clinical psychology, special education or speech and hearing. Evidently, the trend is moving towards discarding stigmatizing terms like imbeciles, delinquents, mental retardates, schizophrenics, deaf, blind or dyslexics in professional writing. It has gone even fur-

ther from using terms that refer to these persons in first person, such as, 'children with hearing impairment' is preferred to 'hearing impaired children'. Despite these sensitive issues related to choice or semantics of words, many of the reviewed manuscripts were found to loosely use words or even interchange standard nomenclature as in an instance 'disability free life expectancy' got written as 'handicap free life expectancy' with obviously different connotations.

### ***M. Editing-Proof Reading-Typological Errors***

Although unintended, most reviewed manuscripts had several spelling errors ('investigating' as 'investing', 'misinformation' as 'miss information', 'cope up' for 'cope with', 'native participants' as 'naïve participants'), confused similar words ('affect-effect', 'its-it's', 'choose-chose', 'advise-advice', 'accept-expect', 'proceed-precede', 'between-among', 'less-fewer', 'since-while', 'that-which', 'compared with-compared to') or had unwanted irrational use of lower and upper cases in running text.

### ***N. Organization***

Sequencing, serial arrangement, structuring and organization of sections or sub-sections albeit within the prescribed page length or word limits and without misshapen bulges across the research paper is a major craft and challenge for research writers. Many submissions in this review were found to transgress these expectations on several counts thereby leading to their disqualification. A few papers transgressed borders of fair use either in the form of copyright and sources not being mentioned or acknowledged, indulging in self-plagiarism, cut-and-copy excerpts from world wide web, etc. It is vital for all prospective contributors to be wary of the consequences for indulging in fabrication, falsification, duplication, ghost authorship, gift authorship, lack of ethical approval or clearance, non-disclosure, 'salami' publications, not mentioning conflicts of interests, indulging in auto citation, duplicate submission, etc

## **DISCUSSION**

Quite unlike the focus of the present study on pre-publication manuscripts, related studies have addressed on the problems and practices

in published academic writing (Jalongo 1985; Boice and Johnson 1984; Boice and Jones 1984; Hartley and Knapper 1984; Henson 1984; Lumsden 1984). Others have periodically piled tips and guidelines on effective academic research writing for interested authors (Machi and McEvoy 2009; Browner 1999; Wilkinson 1991; Huth 1990; Mair 1983). While these endeavors may be appreciated as post hoc analysis of the quality in research papers, much is desired to be done at the stage of prepublication for the benefit of prospective and budding researchers. Such research, particularly, is relevant to contemporary time's publications.

Many of the errors identified and listed in this paper do not seem to be unavoidable. The availability of a readymade inventory or checklist along the lines but tailored to the requirements of every journal and posted along with the standard 'instructions to authors' may minimize possible errors by contributors as well as the job of the reviewers. It could also pave way for speedy reviews and enhance the quality of research publications.

Ideally, academic authorship is not to be construed as an all-or-none phenomenon. There can be no such thing as error-free manuscript or comment-free review report. Rather, reviewing as well as improving quality in research writing go hand-in-hand as a relatively dynamic continuing educational activity to be crafted, cultivated and cultured on a continual basis in the incessant pursuit of an ever elusive optimum perfection and excellence in science which can be never attained-akin to the proverbial dog chasing the rabbit in the woods. The dog will never catch up with the rabbit's speed nor will the rabbit cease running at the sight of the dog! Equally important is the long pending challenging issue for editors of academic journals to come up with a ready-reckon and advisor on guidelines for benefit of ongoing and prospective reviewers to improve their objectivity and reliability during the review process (Meriwether 2001; Strayhorn et al. 1993; Copa 1978).

## **CONCLUSION**

In conclusion, the present paper has attempted to catalogue common errors, flaws and pitfalls frequently observed in pre-publication research papers submitted for scholarly peer reviews. During this process, a host of slip-ups

have been listed across various sections of a typical research paper received for review, which should serve as eye-opener to prospective authors seeking to improve quality of their research output in social science journals.

### RECOMMENDATIONS

As the issues and illustrations raised in this paper are generic in nature but nevertheless are significant, they can be easily handled by research writers and even novice authors by developing guidelines and a checklist of several dos and don'ts derived from this paper. For the editors, these findings can help formulating a journal policy, develop procedures and practices for error auditing in research papers, or facilitate formulation of authorship education and continuing research training programs.

### LIMITATIONS

The sample size included in this investigation is admittedly preliminary and limited. The evaluation of the research papers are evidently based on the observations and experiences of a single reviewer which would carry greater value and would require corroboration by multiple reviewers across many more journals related to the area of social sciences.

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