

# An Author's Guide to Writing Articles and Reviews for *Educational Research Review*

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### **A guide for writing scholarly articles or reviews for the Educational Research Review**

#### **Introduction**

*Educational Research Review* publishes different types of reviews, theoretical articles, research critiques and forum papers. It calls for a systematic meticulous approach of each contribution to foster the growth in the field. A clear and concise way of communication based on a standard and explicit organization of a review founding accessible syntheses of the evidence. This way, well-defined and unbiased strategies ensure any prospective publication meets the standards of good quality contribution to theory, practice or policy in the educational field. In short, Edurevs aspirations. (APA, 2003; Centre for dissemination and reviews, 2006).

This document describes different types of [reviews](#) and [other](#) acceptable contributions. Indispensable [standards](#) and important [guidelines](#), authors should weigh before writing for publication, will be introduced to help one structurize the review in a framework corresponding the purpose of research or type of contribution. This document intents to make prospective authors familiar with Edurev’s basic principles and philosopy regarding possible publications.

#### **Contributable publications**

##### **I. Reviews**

###### **a) Different types**

In general, reviews are divided in three different types or categories, each with own qualities and perspectives on reviewing a topic: a systematic review, a best-evidence synthesis and a narrative review.

#### **Systematic Review**

A systematic review identifies, appraises and synthesizes research evidence from individual studies based on a strict protocol and consequently makes a valuable source of information. This rigour

approach ensures all possible and relevant research bases has been considered and a valid analysis of the original studies has been made, minimizing the risk of bias, providing a transparent study enable for replication (Centre for reviews and disseminations, 2006). The reader itself must be able to draw the same conclusions or exercise judgement concerning individual researchers' flaws (Campbell Collaboration, 2006; Crombie & Davies, 2006). The meticulous care for study inclusion in a balanced impartial way serves as a measure of high quality (Crombie & Davies, 2006). A review should not be exhaustive but more situated, partial and in a desirable perspective. It is gatekeeping, policing and productive rather than merely mirroring (Lather, 1973). Systematic reviews are best suitable for focused topics (Collins & Fauser, 2005). In sum: "a Systematic Review attempts to bring the same level of rigour to reviewing research evidence as should be used in producing that research evidence in the first place." (Crombie & Davies, 2006, p1). [Meta-Analysis](#) can be considered to pool the results of individual studies.

## **Best-Evidence Synthesis**

A Best-Evidence synthesis offers an alternative to both a [meta-analytic](#) and a [narrative](#) review, combining systematic quantitative methods with the attention to individual studies and substantive issues of a narrative point of view and with its focus on the best evidence in a field. It adds rational, systematic methods in study-selection and effectiveness of treatment (by use of effect size). To prevent reviewers' bias, it emphasizes the importance of consistent, well-justified and clearly stated a priori inclusion criteria (also attentive to unpublished studies and those of which effect sizes cannot be calculated) rather than the exhaustive inclusion principles of meta-analysis. The obtained effect sizes and any outcomes of pooling are a point of departure for a critical examination of the literature in contrast to meta-analysis where effect sizes are the result to confirm the conclusion. All the review procedures are described clearly and comprehensive providing the reader enough information about the primary research. Therefore every reader must be able to reach independent conclusions (Slavin, 1986). In other terms: "Far more information is extracted from a large literature by clearly describing the best evidence on a topic than by using limited journal space to describe statistical analyses of the entire methodologically and substantively diverse literature." (Slavin, 1986, p. 7)

## **Narrative Review**

A narrative review summarizes different primary studies from which conclusions may be drawn into a holistic interpretation contributed by the reviewers' own experience, existing theories and models (Campbell Collaboration, 2001; Kirkevold, 1997). Results are of a qualitative rather than a quantitative meaning. One of its strengths is its proposal to comprehend the diversities and pluralities of understanding around scholarly research topics and the opportunity to speak with self-knowledge, reflective practice and acknowledgement of shared educational phenomena (Jones, 2004). Narrative

Reviews are taken best suitable for comprehensive topics (Collins & Fauser, 2005). Different qualitative techniques such as [meta-ethnography](#) and phenomenography (Marton & Booth, 1997) exist to compare different studies and to interpret the results in a value-added content. Narrative Reviews should make the search criteria and the criteria for inclusion explicit. It critically evaluates the specific topic of research.

## **b) Different Objectives**

Reviews can be discriminated concerning their objectives.

## **Integrative Research Review**

An Integrative Research Review synthesizes the accumulated state of knowledge on similar or related educational topics, highlighting important issues and trends in that body of scholarship. The reviewer shapes a coherent whole within a comprehensive, systematic structure (comparable with primary research) describing how the particular issue is conceptualized within the literature, how research methods and theories have shaped the outcomes, strengths and weaknesses of the literature. In short, It critically evaluates material that has already been published (Taveggia, 1974; APA, 2003). In an interpretative or evaluative framework accounting for the outcomes, [meta-analysis](#) can be of particular interest. Central to the validity of knowledge is the possibility of scientific inferences (Cooper, 1982).

## **Theoretical Review**

A theoretical review describes in a critical way the evolution of theories and the way they are understood in different contexts. It draws on existing research literature to advance theory in education research (APA, 2003). It primarily explains how a theory shapes research and our understandings since research is carried out in the frame of exploring theories. Founded on the literature new theoretical proposals can be assumed and developed or existing theories can be analyzed, pointing out flaws or demonstrating the superiority of one theory over another. Empirical information is presented only when it affects theoretical issues. The sections of a theoretical review are usually ordered by relationship rather than by chronology (APA, 2003).

## **Methodological Review**

A methodological review describes employed research designs, methods and procedures in educational research. It highlights strengths and weaknesses of methodological tools and explores

how methods constrain or open up opportunities for learning about educational problems. The review focuses on new methodological approaches, modifications of existing methods and discussions of quantitative and data analytic approaches. Empirical data should be used only for an illustration of the approach (APA, 2003). The writing style should be adapted to educational researchers rather than methodologists.

## **Thematic Review**

A thematic review describes particular areas of the literature or particular educational approaches or learning models. The purpose of the outcomes often is to identify weaknesses and to disseminate key steps for an improvement on the particular issue. It provides an in-depth examination of principles and procedures through evaluation of relevant objectives. It focuses a central element which is taken under consideration from different point of views. It can be a comparative study to analyze one specific domain, filled up with gathered experiences from different angles to discover innovative approaches, providing a range of different inputs.

## **State-Of-The-Art Review**

A state-of-the-art review considers mainly the most current research in a given area or concerning a given topic. It often summarizes current and emerging educational trends, research priorities and standardisations in a particular field of interest. The review aims to provide a critical survey of the extensive literature produced in the past decade, a synthesis of current thinking in the field. It may offer new perspectives on an issue or point out an area in need of further research.

## **Historical Review**

A historical review is a survey of the development of a particular field of study. It analyses the literature in an historical context. Explanations for educational phenomena are framed within the historical forces for instance educational policy and societal developments, shaping language and understanding.

## **Comparison of two perspectives review**

A comparison of two perspectives provides a way to understand a given topic based on the literature from two or more disciplines since similar topics may be subject of research in different scientific or scholarly fields.

## **Review complement**

A review complemented by an empirical study is a full review on a subject that is followed by a short empirical study that investigates the outcomes of the review.

## **II. Other possible contributions**

### **Theoretical Contribution**

A theoretical contribution provides a value-added contribution to current thinking which not necessarily means totally new theories. However, modifications or extensions of current theories should alter scholars' extant views in important ways. The degree of a theory's contribution or quality (how different it is from current thinking) is more important than the scope of the contribution or quantity (how much of the field is impacted). It should alter the research practice rather than simply tweak a conceptual model beyond making token statements. It has been built on a well-founded convincing argumentation and is grounded in reasonable, explicit views and empirical research. The subject is of current contemporary interest to educational research (Whetten, 1989).

### **Research Critique**

A research critique goes beyond summarizing original sources faithfully. It provides a critical assessment of the literature based on individual understandings. It reflects implications for the field of education with regard to the selected educational topics. The reading material should first be described correct and fairly. Only after an objective description, critical thinking and judgement are applied to the ideas by means of educational research methodologies and language for critiquing. At the end, grounded alternatives are provided, founded on the given flaws and critiques of the related issue.

### **Forum Paper**

A forum paper is a paper presenting new ideas or a reaction to published materials stimulating debate. It is necessarily well-founded in the literature.

### **Standards for prospective publication**

## 0. Introduction

The **quality of research** is a must and should be critically reviewed before committing any review or other contribution for publication. The research should be justifiable for publication, meaning sufficiently important and free from flaws. A contribution reflecting poor methods is undoubtedly unacceptable. Evaluate the research and judge its contribution by completing the given standards meriting possible publications, for instance by defining the significance of the research question; selection of search strategy and study design; inclusion of studies; representativeness of the study population and selection of data synthesis.

Typically, an appropriate **length** of an article for publication in Edurev is 8500 words.

This document provides different criteria or standards prior to consider publication of one's educational endeavour. To avoid stifling creativity, it should be used like a powerful instrument of postulations rather than a rigid tool of compelled rules. Edurev standards are fundamental criteria for the reporting of educational research, based on the *REPOSE guidelines (Guidelines for the Reporting of Primary Empirical Research Studies in Education; Newman & Elbourne, 2004)* of the *Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre)*. Those standards ensure a more 'complete' reporting of important information about the aims, methods, contexts, results and conclusions of (primary empirical) research studies in education (Newman & Elbourne, 2004). The same criteria are used by Edurev's editors and reviewers to evaluate one's contribution.

Different standards are required for different types of publication. Depending on objectives for instance, certain aspects are more focused or demanded and therefore other standards are significant.

## I. Standards for Reviews

### a) Overall Quality & Scientific Originality (including quality of literature used)

Reviews need to take into account the quality of the [literature](#) and its impact on findings. Authors should attempt to review all relevant literature on a topic, including cross-disciplinary work. A consistent description of procedures is required to provide external quality assurance of inclusion and exclusion criteria, keyword mapping (minimizing data entry errors) and data-extraction codes. New and accessible syntheses of evidence or scopes are produced and of valuable contribution to the field.

## **b) Theoretical Framework; Conceptual Rationale; Pragmatic Grounding**

Describe the broad [aims](#) of the study: why is the study done, why at this time, with this sample and in this context, the study's foundation and when it was carried out. Relevant background [literature](#) should be reviewed and synthesized. The study should be linked to theory and/or other empirical studies.

## **c) Clear definition of the research questions/purpose**

The [purpose](#) of any article should be to connect the particular problem to a larger context of education. Such purpose should be clearly explained and [research questions](#) should be listed briefly and clearly. Describe the study research question, hypothesis and/or possible predictions with a preferred accuracy since it directs the used research design. When relevant, describe the topic focus of the study and curriculum area as well.

## **d) Research design, data sources, sampling and procedure**

Describe and justify the used [data-collection](#) method, the selection of a [study design](#), allocation conditions, investigated concepts and variables, e.g. questionnaire survey, ethnography, quasi-experiment like the investigated concepts or variables, the sampling strategy (population, sample selection and planned sample size), subject recruiting, the way of consent, etc.

## **e) Research Method & Instruments**

Describe and justify the used [methods](#) to process and analyze the data. Depending on the type of research, quantitative versus qualitative, different measurement [instruments](#) must be taken under consideration e.g. data handling or statistical tests.

## **f) Quality & Appropriateness of the Analysis**

A review should go beyond a description to include analysis and critiques of theories, methods and conclusions represented in the [literature](#). This [analysis](#) should also examine which perspectives are included or excluded in a body of work and should be reflective in nature. Discuss and substantiate the rigour, trustworthiness, reliability and validity of the analysis.

## **g) Clarity of the results and appropriateness of the interpretations**

Study results will vary according to the selected [study type](#). Nevertheless, some general aspects are of particular relevance for secondary [data analysis](#). Clear and detailed information with regard to the [context](#) of the study and the [subjects](#) e.g.: age, sex, SES, country, culture. Reported [results](#) should be consistent with the methods used. For quantitative research every significant value of all variables should be mentioned and explained, for qualitative research a clear picture must explain how the results (e.g. themes) are derived from the data collected.

#### **h) Organization, Structure and brevity**

The study needs to be reported according to the [APA standards](#) for publication. In practice, deviation from the rigorous prescriptions can be allowed for different reasons e.g. the complexity or diversity of the study or the artificial distinction between different topics like [results](#) and [discussion](#). The report has to be founded on a systematic ground, shaped in different common divisions: [introduction](#), [methods](#), [results](#), [conclusion](#), coloured by the aspects of the study. In short: a clear comprehensive organization with brevity kept in mind, containing all the important aspects of the study since secondary research, individual interpretation or replication can be made.

#### **i) Significance for Theory, Practice and Policy; Relevance to the field of education**

The article should seek to inform and/or illuminate questions important to the field of education. Such questions may be broadly based but they should have implications for educational problems. The publication should be seen like an important contribution to science and a relevant source of information to different educators dealing with educational problems. Good quality research about the effects of educational interventions can help practice and policy-makers to make decisions. Also theory is a necessity to ground possible useful interventions or educational problem-solving issues.

#### **j) Style and language**

The article must be well written and conform to the style of the *Publication Manual of the American Psychological Association* ([APA](#)). Authors should avoid the use of unexplained jargon and should write in respectable and correct Oxford English. Referees are not expected to correct or copyedit one's contribution. Language correction is not part of the peer review process. Keep in mind that the research publications are mainly written for people in educational research, practice or policy. Explain, therefore, the phenomena or results in understandable terms.

## **II. Standards for Theoretical Contributions, Research Critiques and Forum Papers**

- a) [Overall Quality & Scientific Originality \(including quality of literature used\)](#)
- b) [Theoretical Framework; Conceptual Rationale; Pragmatic Grounding](#)

- c) [Clear definition of the research questions/purpose](#)
- d) [Organization, Structure and brevity](#)
- e) [Significance for Theory, Practice and Policy; Relevance to the field of education](#)
- f) [Style and language](#)

In addition to the standards above, a research critique in contrast with other contributions should explicit ground alternatives for the stated problem as well.

### **Guidelines for prospective publication**

A systematic approach is essential to make sure the findings of a study can be of significant scientific contribution. It meets the requirements of taking some constructional rules into account and although variation is possible depending on the type of contribution, there are basic conditions which has to be fulfilled before a contribution or a review can be considered for publication. The stages a high-appraised article, mainly considered to be a review, should roughly contain are briefly discussed and based on the *Manual of the Psychological Association* ([APA](#)).

#### **I. Abstract**

An abstract is a brief, comprehensive summary of the contents of an article allowing readers to survey contents quickly. It enables abstracting and information services to index and retrieve articles. It is often a first contact with the publication, a basis to appraise the effort of further exploration. Consequently, it is vital to well organize the abstract. It should be dense yet readable, brief and self-contained. Embedding keywords will enhance the user's ability to find it.

An abstract needs to reflect the purpose and content correctly with its focus on the most important concepts, findings or implications. It should define abbreviations, unique terms, names and/or publication dates of tests and authors. Each sentence must be maximally informative, especially the lead. For instance, do not waste space by repeating the title. In short, write a clear and vigorous report rather than evaluation, omitting personal comments on aspects of the contribution.

An abstract can be descriptive, demonstrating an article's organization as well as informative, summarizing facts and detailed information. However, it should not exceed a limit of approximately 150 words.

*Specific detailed abstract information concerning types of publication can be found in the Manual of the American Psychological Association ([APA](#)).*

## **II. Introduction**

An introduction starts with the very first paragraph of a manuscript and does not need to be labelled. It presents the specific research problem and strategy and summarizes the significance of the study, theoretical implications and connections with previous studies in the area.

Discuss rather than exhaust the (relevant primary research) literature concerning the research topics. It establishes a pertinent frame and connects different findings from different related studies. The literature section summarizes the knowledge of a theme like it was before reviewing the content. However, assume that one is not reading your manuscript to explore a complete digest. Instead, focus on the primary research journals and cite articles reporting specific results relevant to the study. Essential to be a significant cumulative scientific contribution are citations and references to relevant earlier work emphasizing pertinent methods, findings and conclusions and consequently recognize the priority of the work of others as well. Justify and explicitly write down used databases, indexes and search terms. The literature should provide a clear understanding of the logical continuity between previous and present work. Controversial studies, when relevant, should be treated fairly since conflicting conclusions are creating a stronger statement in contrast to one extensive inconclusive discussion.

The closing paragraph of an introduction explains the selected approach to solve the relevant problem with a justification through scientific merits and advantages of a particular approach in answering particular questions. Unless a novel technique or methodology has been used, do not discuss techniques or protocols.

### **a) A thorough literature**

A substantive, thorough, sophisticated literature is a necessity. Both aspects are fulfilled: generativity and cumulativeness: building on prior scholarship and research regarding a topic. It is even more important in educational research where problems, audience and methods are complex and not sharply defined and at consequence, shared knowledge is more difficult to assume (Boote & Beile, 2005).

A literature review should set the broad context of the study. It should clearly demarcate what is and what is not within the scope of the investigation and justify those decisions. It situates an existing literature in a broader scholarly and historical context and should critically examine the research methods used in existing literature. It goes beyond summarizing to a synthesis and a new perspective (Boote & Beile, 2005).

Founded on Hart's criteria (1999) a study of Boote & Beile (2005) grouped crucial aspects into five categories:

- 1. Coverage** refers to the author's justification of inclusion and exclusion criteria regarding the selection of literature for the review. Different methods and analytic processes exist to search literature and to make decisions about suitability and quality of materials (Cooper, 1985). To convince the reader of a thoroughly mined and purposefully decided literature selection, be explicit about the used search strategies, criteria, databases and indexes. Coverage means more than merely an exhaustive collection of everything previously written on a topic. It contends for topicality, comprehensiveness, breadth, exclusion, relevance, currency, availability and authority. For instance, suppose very little has been written about a certain topic, the author may need to broaden the search to examine analogous research in other fields or topic. On the other hand, when a great deal has been written about the topic, it may be interesting to focus on the best available evidence or on a smaller number of key conceptual pieces. Irrespective of strategy, an audience needs to be convinced about a thorough and purposeful inclusion (Bruce, 2001a).
- 2. Synthesis** refers to the quality of a summary, analysis and synthesis of the selected literature. Different aspects need to be considered: Distinguish what has been done in the field from what needs to be done; Place the topic or problem in the broader scholarly literature; Place the research in the historical context of the field; Acquire and enhance the subject vocabulary; Articulate important variables and phenomena relevant to the topic; Synthesize and gain a new perspective on the literature. It enables the author to clarify and resolve inconsistencies and tensions in the literature and thereby make a genuine contribution to the state of knowledge in the field by developing theories with more explanatory and predictive power, clarifying the scope and limitations of ideas, posing fruitful empirical investigations and/or identifying and pursuing unresolved problems.
- 3. Methodology** refers to the authors' identification of main methodologies and research techniques used in the field and the analysis of advantages and disadvantages. Moreover, the author should be well informed with related ideas and theories in the field to research methodologies or at least should be possible to recognize how previous researchers' methodological choices affect the research findings. The author should justify own methodological choices and perhaps even suggest and justify new research methods.
- 4. Significance** refers to the rationalization of the practical and scholarly significance of the research problem. If possible, discuss both implications of the existing research on the topic and preferably note any ambiguities or shortcomings in the literature.

5. **Rhetoric** refers to a coherent clear structure that supports the review. It contributes to clear and logical formed claims that follow out of the literature based on its analysis and synthesis through purposeful organization and cogent writing. Structure and organisation are key determinants in influence and persuasivity for a review to the readers.

All together, high standards on these criteria indicate a thorough, sophisticated understanding of a field of study. It provides a way to shift the problem to find perspectives that are progressively more explanatory and insightful. It reflects a researchers' profound understanding in prior research which makes a method of data collection or data analysis a convincing process to the reader.

#### *Precaution to pitfalls*

According to Boote & Beile (2004) focusing mainly on methodological issues could result in a research community addressing the symptom rather than the cause. They believe a researcher must understand prior research in their field, its strengths and weaknesses, before he or she can be expected to choose appropriate methods of data collection and data analysis. Several significant aspects to be attentive to, concerning the literature of the study, are suggested.

1. Preliminary to the literature review, an authors' relationship with the literature should be one of **reporting**, instead of searching or learning. When an author beliefs it to be a duty, it will work as a restrain to haphazardly cataloguing prior findings and drive him to a critically analysis and synthesis of the field (Bruce, 1994).
2. Review journals increasingly expect authors to be explicit on the identification of included research, in general, the criteria for inclusion and exclusion. Unfortunately, many authors use haphazard ways to approach searching for literature. One of the most contentious and potential criterion to improve the quality of literature reviews, should at least be supported by a more **methodical approach**. The impact of such a crucial factor to improvement may not be underestimated (Boote & Beile, 1004).
3. A literature review is without a doubt a **first important stone** to a strong methodological fit, original and substantial research. The review needs to gatekeep, police and lead to new productive work rather then merely mirroring the field. (Mullins & Kiley, 2002; Lather, 1973; Hart, 1999).
4. According to Hart (1999) the quality of the **bibliographies** is often inferior and many authors lack the library skills to construct an appropriate bibliography (Zaporozhetz, 1987). A study of Boote & Beile (2004) found that students who cited better sources in their dissertations tended to be better able to analyze and synthesize literature in their field.

5. Authors should be aware that **different sources** have different qualities and the literature review should explicitly differentiate low from high quality sources. Principally rely on peer-reviewed, scholarly resources and when others sources are used (like journals, books and websites) it should be kept in mind one needs to be judicious in use of such sources. It can not be left unsaid that in some fields there is a paucity of scholarly articles and some points are better supported by non-scholarly sources or useful material may emerge in non-scholarly venues. "However, the purpose of the peer review process at major journals and academic presses is to improve our ability to trust **claims** that are made. Whenever we support a claim using citations that have not been vetted by our peers, we must explain to our readers why the citation warrants the claim. Indeed, even when we cite work from well-respected publications we must still critically examine both whether the claim is itself warranted and acknowledge the potential for the fallibility of that claim." (Boote & Beile, 2004, p 20-21) The literature review therefore should be held to consistent criteria or standards which prevent literature reviews being merely disjointed summaries of prior research and broad surveys of a haphazard collection of literature (Zapozhertz, 1987).

Without any doubt this discussion yields full justice to the importance of a thorough, critical examination of the state of the field. It is the foundation of a strong, significant research that uphold synthesizing literature, gaining new perspectives, discussing and critiquing the methodologies and explaining the scholarly significance of the research (Boote & Beile, 2004). It is a gatekeeper to convince readers about the authors' understanding of its field, a prerequisite for sophisticated, progressive research (Hart, 1999).

The purpose of the discussed aspects is to make the author aware of some cruciality in its work and to emphasize the critical aspects of a strong and founded study. Its stiffness, however, may not be curbing the authors' originality and creativity.

#### **b) Well formulated question**

A systematic review contains a targeted research question relevant to practitioners. The more specific the question the more specific the research can be performed. Consequently more relevant and useful information can be filtered from irrelevant information or garbage. The question needs to be well-formulated containing a description of the target group, the intervention researched, possible comparisons with other interventions and the outcome in need of evaluation. Based on the descriptions of used data, results and conclusions should be reproducible by any reader of the review.

### **c) Well defined search strategy**

All possible sources should be considered and all used sources should be mentioned to make results reproducible. Important factors to be considered are for instance timetables of data, journals data and search terms. In short, a very profound search strategy of published as well as unpublished data is essential, describing in detail its methods to make data reproducible and controllable.

It is important to analyse a search-question in different search-terms and come up with synonymous, translations, related, broaden and narrow terms. Use those terms in an information source or combine the different terms in interesting search-questions to prevent junk. To specify one's question, Booleans or truncations can be of any interest. Start with, but not exclusively screen, the most credible research journals and put great emphasize on a blind review system.

### **III. Method**

This section contains a detailed description of the study's conduction. The provided information should enable the reader to evaluate one's methods and results or even make it possible to replicate the research. When the method already has been published in detail elsewhere, a reference to the previous source and a brief synopsis of the method are sufficient.

The section contains a balanced portion of information: only but no less then the essential to comprehend and replicate the study. Redundant or insufficient information should be avoided.

#### **a) Objective selection process of studies**

Use objective inclusion- and exclusion criteria, referring to the selection of studies implemented in the research process. A selection procedure contains criteria to abstract relevant studies such as type of study, study population, intervention and outcome. The selection process based on explicit criteria should be performed by two independent reviewers blind for both journal and author.

#### **b) Critical appraisal of methodological quality (methodological appraisal)**

Validated checklists are important instruments for the screening process based on different criteria's (possible linked to the publisher organization). Methodological appraisal depends on the type of research design and should be done by two independent reviewers to test for reproducibility. The process is blind for both journal and author to prevent bias.

### c) Objective data-extraction

The extraction form should be designed before the study is done to prevent data-dredging. It should be performed by two independent reviewers which mean two reviewers will undertake data abstraction independently using a tailored data collection list (in annex). Disagreements can be resolved by discussion or when necessary an arbitrator. In case of missing data, the author of the particular article needs to be located to retrieve all data needed to include the study in de meta-analysis. When missing data cannot be obtained, the study should be excluded from the research.

### d) Synthesis of data

Data synthesis in a review aims at collating and summarizing the results of included primary studies. Non-quantitative synthesis ([meta-ethnography](#)) describes data characteristics and results objective and meaningful by tabulation. It is an essential part to understand the data, plan the quantitative synthesis and prevent interpretation flaws. The process should be explicit and rigorous. The supplement of a quantitative synthesis or a statistical procedure ([meta-analysis](#)) is based on the preceding extracted data presented by the qualitative synthesis (Deeks et. Al, 2004).

|                  | <b>Meta-Analysis</b> | <b>Meta-Ethnography</b> |
|------------------|----------------------|-------------------------|
| <i>Nature</i>    | Quantitative         | Qualitative             |
| <i>Aim</i>       | Accumulating         | Make sense              |
| <i>Studies</i>   | Strictly comparable  | Basic comparability     |
| <i>Result</i>    | More power           | Add value in content    |
| <i>Synthesis</i> | Through data         | Through interpretation  |

## Meta-Analysis

“A Meta-analysis is the analysis of analyses.” (Glass, 1976, p3) The statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating findings (Glass, 1976). Meta-Analysis is a statistical technique offering a possibility to classify and measure the conditions and results of studies on a more precise and rigour way compared with verbal descriptions of research. Results of empirical studies are subject to random fluctuations explained by outcomes based on samples rather than an entire population and/or the heterogeneity in study characteristics (Glass, 1977; Ijzendoorn, 1998; Van de Noortgate & Onghena, 2005). It is an alternative for the obsolete statistically significant-non-significant dichotomy (vote-counting method), only informational in a simple two-factor model, which fails to answer more complex questions like the effect size or effectiveness of treatment (Glass, 1976). Although meta-analysis can be a component of a Systematic Review, it is

differing in its need for careful consideration since its fruitful- or favourableness depends on the research question. After formulating a hypothetical question, study selection and relevant data-extraction, the study results needs to be converted from the different used studies to a comparable measure, for instance Pearson's correlation coefficient. Different models and techniques exist to combine and/or compare the results and possibly look for moderator variables: the essence of meta-analysis. A common measure of treatment effectiveness is the effect size defined as the standard mean difference between two groups, often the experimental and the control group. (Van de Noortgate & Onghena, 2005).

## **Meta-ethnography**

Meta-ethnography is a method used to synthesize qualitative research findings, corresponding the qualitative data analyses of the included studies. It generates an interpretative synthesis, rather than an aggregative, wholly quantitative, summary of the findings and is uniquely well-suited to summarising diverse literatures since it allows integration of the findings of multiple sources. It involves induction and interpretation and follows a similar approach to the methods of first order analysis (qualitative data analysis used in the studies being synthesised). Concepts of different studies are extracted, generating a second order concept through meta-ethnography. It is an interpretative methodology and consequently not limited to synthesizing strictly comparable studies. It may be used to synthesize information from a variety of sources including quantitative studies, qualitative studies, grey literature, and professional expertise. In other words, meta-ethnography generalizes ethnographic or in general qualitative studies. Based on explicit criteria different qualitative research projects are compared. Founded on these findings, different ways are aggregated to create more cogent syntheses or research. Meta-Ethnography offers useful procedural advice from both comparative and cumulative analyses of qualitative data.

## **IV. Results or Outcomes**

Summarize the collected data and used (statistical or data analytic) procedures. The reported data should be detailed to the extent that conclusions can be logical derived and justified. All relevant results should be mentioned even those conflicting with the [research question](#). Individual scores or raw data should be avoided unless they represent a single-case design or illustrative sample. This section contains pure descriptive facts rather than implications.

### *Tables and figures*

The selection of a medium to report one's data should be well-considered with its focus on the aspect of being clearly and economically. Where tables provide exact values with a possibility to present

complex data and analyses in a familiar format, figures provide a quick visual impression, useful to illustrate complex relationships and general comparisons but with less precision. In view of reproduction costs, reserve graphics for the most important data and situations. Tables or figures should only be used when contributing to the readability or communication.

Do not use a table or figure as an isolated aspect but always refer to them in the text with a clear explanation to enhance reader's intelligibility. All tables are referred to as *tables*, all graphs, pictures or drawings as *figures* and all are provided with a logic unique number in its type.

### *Statistical presentation*

Different approaches exist to conduct and report inferential statistics drawn from findings concerning the tested hypothesis. At all times a selection of techniques should be justifiable in the scope of an accurate and responsible reporting of results. Important information should be included even if no significant effect is being reported. That way, possible conclusions can be fully understood by the reader and the study can be considered for meta-analysis. 'Important information' contains for instance the obtained value of the test statistic, the degrees of freedom, the probability of obtaining a value as extreme as or more extreme than the one obtained, and the direction of the effect.

Descriptive statistics such as per-cell sample size, means, correlation, and standard deviation are an absolute must for possible passing on a line of reasoning to a reader. An extremely effective way to report results is confidence intervals. Therefore its use is strongly recommended; moreover, a single confidence interval size throughout the course of the paper is most effective. Assume a statistical professional knowledge by the reader but justify particular tests or approaches.

The statistical power of the tests should be seriously considered since it is related to the likelihood of correctly rejecting the hypothesis given a particular alpha level, effect size and sample size.

Therefore, provide substantial evidence of the effective power of the study and be aware of the crucial importance of sample size in various assumptions. Two types of probabilities are generally associated with reporting significant levels in inferential statistics. One is called the 'alpha level' and refers to an a priori selected probability of an acceptable level of falsely rejecting the null-hypothesis. Another kind is called the *p* value (or significance probability) and refers to a posterior likelihood of obtaining a result that is as extreme as or more extreme than the observed value, assuming the null-hypothesis is true. A subset of values, reaching prespecified levels of statistical significance can be indicated with asterisks but at all times particularly state the alpha level used to conduct the tests.

Those two types of probability however do not reflect the magnitude of an effect or the strength of a relationship. A reason to include an index for both, estimated with a number of common effect size estimations. A general rule regarding a multiple degree-of-freedom effect indicators appears to be a decomposition into meaningful one degree-of-freedom effects as it tends to be more useful. However, enough information should be added so a reader can assess the observed effect or relationship.

*More detailed information about what information is especially adequate in different statistics can be read in the Manual of the American Psychological Association ([APA](#)).*

## **V. Conclusion and Discussion**

At this point, a hypothesis has been examined, data collected and analysed and results summarized. In this section, implications of those results are evaluated and interpreted, with respect to the original [research question](#). Meaning, purpose and (practical) relevance of the findings are disclosed to the reader, attempting to convince the reader of the study's merit (Hess, 2004). Theoretical consequences and the validity of conclusions are emphasized.

It is important to make a clear statement of support or non-support concerning the research question and to state the major findings of the study. The results should be written in a direct, declarative and succinct proclamation. Nevertheless, it is more than simply reformulating and repeating previous points. Data or referees to the study design should be excluded. Every statement must be a contribution to the presented position and enhance a readers understanding of the importance of a study and its findings. However, interpretation should not go beyond what is supported by the data. There is little room for speculation where the focus should remain on the research question and results. Therefore, avoid tangential issues (Hess, 2004).

Relate the study with other studies and explain the relationship. Similarities and differences between the results of the current study and other (former) studies can clarify and confirm conclusions. When others support the findings, for instance, it may strengthen the importance of the study results. Differences in the research design compared with previous research may explain conflicting results. At any time, contrasting own findings with other publications should be done in a professional and responsible way. Criticizing or attacking other studies and investigators in this section is inadmissible (Hess, 2004). Remain objective and address possible alternative explanations of results, not only those that fit the bias.

All studies have limitations, even the best. Identify and acknowledge one's own limitations, point to possible flaws of the study and make suggestions for further research. It often appears that certain questions related to the subject of the study remain unanswered or even become more focused because of the study. In this case, for instance, suggesting further studies can be of great interest. Do not inflate unwarranted importance of the study results nor underestimate its contribution (Hess, 2004).

At the end, a tightly reasoned and self-contained commentary on the importance of the findings may close the discussion. Possible discussed issues are the problem choice, the level of analysis, the application and synthesis. It contains the core of the contribution couch in unambiguous answers related to readers' questions.

*Examples concerning those questions can be found in the Manual of American Psychological Association ([APA](#)).*

In short, this section contains Implications for practice like important results and strength of evidence and Implications for further research like unanswerable and possible new research questions.

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