# Identification of Relevant Articles in Meta-Analysis: Practices and Recommendations

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November 12, 2022

Acknowledgment: The author is grateful to Steve Rains and Alan Goodboy for their incisive

comments on an earlier version of this manuscript.

#### Identification of Relevant Articles in Meta-Analysis: Practices and Recommendations

Meta-analysis is a set of research procedures used to analyze study findings across multiple observations of a given variable, relationship or theoretical model of interest. Just is the case in any individual study, meta-analysis assumes the observations are both representative and valid. Where meta-analysis differentiates itself is its use of individual studies as the units of analysis and aims to review *all* relevant studies or units of analysis, if possible. Although it is understood this aim may never be realized, it is imperative any given analysis attempts to locate studies that may not be published in refereed journals and/or indexed in conventionally used databases in university libraries. Some authors refer to these studies that are difficult to find as the grey or fugitive literature (see Rosenthal, 1994; Rothstein & Hopewell, 2009).

A frequently referenced concern in meta-analysis is the file-drawer problem where studies that are not easily identified in typical database searches go unnoticed in a given review (see Rosenthal, 1994). The fugitive papers have been metaphorically filed in a drawer or indexed in less commonly accessed databases. The primary concern is the papers in the grey literature may report either non-significant results or perhaps even results in the opposite direction a theory would predict. As a consequence, the meta-analysis may overestimate the strength of a relationship if these papers are overlooked. Worse yet, a review may be committing a Type I error in reporting support for the alternative hypothesis when in reality the null is supported. Very often the file drawer problem is termed *publication bias* and refers to published research that is systematically unrepresentative of the population of completed studies (Rothstein & Hopewell, 2009). Sun and Pan (2020) argue a thorough and strenuous attempt to locate all studies, unpublished or otherwise, is a primary method to reduce publication bias. The goal of the current study is to foreground the importance of systematically identifying as many valid studies on a topic that is possible. Very often this aspect of metaanalysis is glossed over in workshops or given comparatively little space in textbooks on metaanalysis (see Lipsey & Wilson, 2001, pp. 23-31). Rothstein and Hopewell (2009) also emphasize the importance of the literature search in their book chapter and consider its importance, "underappreciated and underemphasized" (p. 105).

With the advancements in electronic databases and the increase in the number of communication journals indexed in Web of Science, it is easier than it used to be to identify relevant articles. There are also databases exclusively for dissertations, such as ProQuest Dissertations and Theses, and at the same time *Google Scholar* routinely identifies convention papers as citing papers. The goal of the current paper is to review practices in the field of communication in relation to the identification of relevant studies in meta-analysis. My own experience indicates practices can be varied across analyses and it would be worthwhile to see if I am mistaken. Before doing so, I will briefly review what practices are prescribed by scholars on the topic. After reviewing current practices, I will make recommendations for more uniform practices in the identification of relevant articles for the field of communication.

#### **Prescribed Practices in Identification of Articles**

For good reason, the most commonly discussed practice in meta-analysis in relation to identifying articles is reliance on database searches. Nearly all expert accounts recommend searching relevant online databases and registries in a given area of inquiry (e.g., Dickersin, 1994). Reed and Baxter (2009) recommend database searches during the course of a metaanalysis should be done iteratively to ensure they are exhaustive. A second method prescribed by Lipsey and Wilson (2001) is to examine the reference sections of articles already identified as relevant to the relationship of interest. They suggest, "this practice should be used throughout the meta-analysis search...that is, each candidate research report is retrieved and screened" (p. 25).

A third possible method to track down the fugitive literature is to communicate with authors who publish in the area of interest via email or through message boards online. This method may be valuable in pursuit of unpublished papers or conference presentations. A number of additional methods were referenced, including searching relevant journals, convention websites and through advertising (Rosenthal, 1994). While these prescribed methods appear all valuable exercises, it is still unclear how many of these practices are used in communication and if investigators rely on similar methods in their aim of identifying relevant articles for inclusion. The next section attempts to identify recent practices in the field.

## **Practices of Identifying Studies in Communication Research**

#### **Process of Selecting Authors**

In an effort to gain perspectives from authors in the field who have conducted metaanalyses, a sample of journals was selected from 2012 through 2022 as publication years. The journals considered central to the field included *Journal of Communication, Human Communication Research, Communication Monographs, Communication Research, Communication Theory, Journal of Applied Communication Research,* and *Communication Education.* Two criteria were used to determine central journals: the journals are sponsored by International Communication Association or National Communication Association and publish quantitative research. A second method to determine journal centrality relied on an earlier article by Feeley (2008) that used bibliometrics to identify core journals and as a result one additional journal, *Communication Research,* was included in this analysis. After this process, the recent citing data from 2020 from *Journal Citation Reports* were used and *Health Communication* was added as it is the most commonly cited journal by one or more of the seven journals. In total, eight journals were reviewed and the number of meta-analyses identified by each journal for the 10-year period are listed in Table 1.

# **Content Analysis**

To identify articles, each journal's website was searched for years 2012-2022 with search term, "meta-analysis" in either title or abstract of the paper. This process resulted in identifying 39 published meta-analyses with some first authors appearing more than once. Among the thirty-nine articles identified, four were recently indexed online, however the full papers and were not available for downloading. Thus, the current review included thirty-six meta-analyses from thirty-five papers with year of publication spread evenly – for example, five meta-analyses were published in five different publishing years among the sample (the papers identified are referenced in the supplemental section).

After articles were identified and downloaded, the relevant section of the meta-analysis (usually labeled "Identification of Articles") was content analyzed. This process occurred in three phases. The first phase took place in April of 2022 and catalogued the various methods used by authors to identify articles. Phase two sought to code each meta-analysis by indicating the presence or absence for each specific method. Phase two took place in late April of 2022. Phase three sought to replicate the coding that took place in phase two with the goal of creating a reliable set of codes the relative frequency of their use through replication. The replication of the coding in phase three took place in June of 2022. The third phase proved useful as two omissions were revealed during the initial article coding during phase two.

There were five methods primarily reported among studies in communication. The three methods described earlier – *database searching, cited references, communication with authors* –

were regularly reported. Two other methods used on occasion were *citing references* and *repeating the database search*. The citing reference search is the process of identifying articles that *cite* either a seminal article or a previous review on the topic of investigation. This method was also labeled the *ancestry search* (Wright et al., 2017) or the *search article method* (Carpenter, 2014). One example was an analysis by Yang et al. (2014) who studied the risk information and seeking process (RISP) model and searched papers that cited the original Griffin et al. (1999) paper and also tested the RISP model.

The repeating the database search is the process of searching databases for additional papers when some time has passed after the initial search. Very often meta-analyses can take months or even years to complete and add the variable length of the review process at a given journal. For example, an initial search might take place in June of 2020 and one might replicate the search in 2022 and filter articles that were published in 2020 or after. Consider an example by Pearce and Field (2016) in their meta-analysis on scary television effects in children. They conducted their first database search in January of 2012 and replicated the search in February of 2013 and identified four additional papers for inclusion. If any additional methods beyond these five were used they were also recorded.

Overall, fourteen (39%) authors used two methods while another eleven papers (31%) used three methods. Only two papers used four methods, zero papers used all five methods and nine papers used only one method (database search). Of note, four additional methods were used to identify papers: (1) listserv request, (2) reviewing websites of relevant authors, (3) searching convention programs, and (4) reviewing previous meta-analyses.

With all thirty-six analyses using a database search and four other methods, there are sixteen potential methods combinations that are mathematically possible among papers. The

seven combinations of practices identified in this sample of journals is listed by frequency in Table 2. All analyses used a database search, five studies used citing reference, and one study used an iterative search method. The following section discusses these results before making recommendations for more uniform practices in the field.

## **Recommended Practices for Identification of Relevant Articles**

The current paper sought to review a sample of meta-analyses that were recently published in central journals in the field of communication. While thirty-six meta-analyses does not represent a comprehensive sample, it provides a valid snapshot of the practices of scholars in relation to how they identify articles for quantitative review. The findings indicate practices are not uniform beyond the method of searching online databases for articles.

It is recommended the following five practices be adopted for future meta-analyses going forward. That practices in identification of articles is not standardized is likely due to the relatively little emphasis put on this aspect of meta-analysis in workshops and texts on the topic. It is agreed among scholars that the search for relevant articles is a critical aspect on the entire study. Without a thorough and systematic data collection process, the study is potentially introducing bias from the onset. The following section expands the discussion on each of the five recommended practices.

### **Search of Relevant Databases**

The most important practice is a thorough search of relevant electronic databases. To best capture all relevant studies, the search must be expertly undertaken with careful consideration given to the use of appropriate search terms and their possible combinations (see Reed & Baxter, 2009). Consider a hypothetical example in communication scholarship. If one was to meta-analyze the literature for studies that compare instructor *nonverbal immediacy* with students'

rating of instructor quality there would likely be many studies in the *Communication and Mass Media Complete* database (e.g., McCroskey et al., 1995). However, the field of educational psychology has a nearly identical construct called *enthusiasm*. Enthusiasm and nonverbal immediacy have great overlap in the items used to indicate each construct. Two articles indicate the overlap – Bettencourt et al. (1983) reported eight indicators of enthusiasm that include eyes, gestures, movement and facial expression, all used as indicators in measuring nonverbal immediacy (Smythe & Hess, 2005). If the research team was unaware of this, the review would potentially miss a critical group of studies that are comparable to the studies on nonverbal immediacy.

In addition to careful consideration to search terms, several databases and relevant registries should be consulted. It is likely the case one has to undergo trial and error to locate the best search term combination as well for each respective database. For example, some databases include theses/dissertations (e.g., ProQuest) while others index convention papers or convention proceedings (e.g., All Academic, ACM). The articles reviewed herein indicated the lion's share of relevant articles were identified through the database search process. It is also recommended scholars consult with a reference librarian at their respective college or university.

#### **Cited Reference Search**

The cited reference search uses one or more included articles to identify if these articles, in turn, cited papers that have not yet been identified for inclusion. This practice was reported by approximately 60% of the papers reviewed. The cited reference search benefits the analysis by observing papers authors have identified in earlier scholarship on the topic. After all, the authors before your own study underwent their own search for articles.

There appears to be two practices used when conducting the cited reference search. One practice is to search the reference list of every included study to date to find articles not yet identified in the database search (see Walter & Murphy, 2018). The second and more commonly used practice in relation to using a cited reference search is to search the reference sections of previous reviews on the relationship of interest for relevant papers (see Feeley et al., 2012; Titsworth et al., 2015, Meta 1). Some meta-analyses build upon earlier meta-analyses and inherit the papers included in previous reviews.

#### **Citing Reference Search**

A valuable and seldom used practice in meta-analysis to identify relevant papers is the citing reference search. Several databases allow this search and google scholar is the most accessible and comprehensive method to conduct this search. Citing reference searches seek to identify articles by reviewing what papers cited a given study, review or author(s).

When doing a citing search using a seminal article or a topic, the task can be daunting, as many original works are highly cited. For example, Carpenter (2014) searched for articles citing the original Petty and Cacioppo (1986) and/or information processing model by Chaiken (1980). These two papers have been cited 13,956 and 7,310 times respectively, as of August 9<sup>th</sup> of 2022. Scholars may consider using filters (e.g., year of study) to limit their results. Alternatively, Rains (2013), in his review of psychological reactance in persuasion, reported using a citing search to identify articles that cited the original Dillard & Shen (2005) study and identified 400 citations between 2005 and 2012.

### **Contacting Authors**

Approximately one-third of the meta-analyses reviewed for this paper reported attempts to communicate with authors/experts of relevant works. There are at least two reasons to reach

out to authors when attempting to identify relevant articles. First, many published reports fail to report the necessary or sufficient statistical information needed to extract an effect size (see Van Stee et al., 2022 for recent discussion). Second, authors in the field may have authored papers on a topic that are unpublished or still in the review process. Pearce and Field (2016) emailed 60 experts to inquire if they had additional papers to recommend on their study of scary movies on children's emotions (and supplied experts their reference list). This process led to five additional studies that were included in the final analyses.

#### **Iterative Database Search**

It is recommended future quantitative reviews conduct two or more database searches throughout the lifespan of the project. This practice is especially recommended if authors sense there is good reason to do so. For example, there may be a meta-analysis where the topic of interest has drawn recent attention in the literature, such as work on the study of risk or information seeking related to COVID (e.g., Zhou & Roberto, 2022). A recent meta-analysis (Authors, 2022) included 50 relevant comparisons and 32 of the comparisons were studies published in 2019 or later. So clearly there can be topics that draw recent attention and require multiple searches in the aim of including recently completed work. A second reason to conduct iterative searches is there may a critical duration of time that has passed between the initial database search and the submission or revision date.

The current paper reviewed the practices of recent authors of meta-analyses in central communication journals. This review represents a glimpse of the practices in the field and sampling articles from the more prestigious journals likely provides an indication of best practices in the field. Some observations from this project are worth sharing.

The first observation from this analysis is the level of variation in the practices among scholars in identifying relevant papers for study inclusion. The modal number of methods was two with authors typically combining a database search with either a cited reference search or contacting authors. Only two papers used four methods in an effort to minimize publication bias and nine papers (25%) used only a database search. More uniformity in methods is recommended in meta-analyses going forward. A second observation is there appears to be inconsistency in the number of databases searched with some papers using one or two databases and other using six or more databases to identify relevant papers. It is also unclear which databases were more or less fruitful than others in locating papers, understanding there is likely much redundancy in the search process. Scholars would benefit from use of PRISMA or other strategies to illustrate the article identification process and which methods produced which articles.

An aim of meta-analysis is to reduce the threat of systematic error that may occur if investigators fail to identify a representation of studies in a given area of investigation. Given this aim, careful attention should be paid to locating relevant studies. It could be argued this initial step of meta-analysis is the most important step in the process. Certainly, it is important to include only relevant papers to avoid unfair comparisons (i.e., comparing apples versus oranges; see Carpenter, 2020). Extracting accurate effect sizes is an important third step and this step can be challenging with the prevalence of insufficient statistical reporting practices (see Van Stee et al., 2022). However, the steps of study inclusion and data extraction rely on a sample that is unbiased.

It is the recommendation of this review that authors rely on (at least) the five methods discussed in the earlier section in the pursuit of providing a complete picture of the body of

research in an area. In addition, there may be additional methods, some referenced herein, authors may use to track down the grey literature. Of course, what additional methods might be fruitful relies on the expertise of the author(s) and their experience in the area of study. For example, some areas have articles authored by independent research teams who area scattered across different fields where other areas may feature papers from two or three laboratories. It is the goal of this paper that future investigations be vigilant in the methods used to identify relevant studies.

Disclosure Statement: The author reports there are no competing interests to declare

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#### **Supplemental Material: Papers Content Reviewed for Retrieval Methods**

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# Table 1

# Meta-Analyses Included for Analysis by Journal (2012-2022)

Journal	Ν	
Communication Research	11	
Journal of Communication	6	
Human Communication Research	6	
Communication Monographs	6	
Health Communication	5	
Communication Education	2	
Communication Theory	0	
J. Applied Communication Research	0	

# Table 2

# Combinations of Practices in Identification of Articles

Practice(s) Reported	Number (%)	
Database Search (DS) + Cited Reference	10 (28)	
Database Search	9 (25)	
Database Search + Cited Reference + Contact Authors	8 (22)	
Database Search + Citing Reference	3 (8)	
Database Search + Cited Reference + Citing Reference	2 (6)	
Database Search + Contacting Authors	2 (6)	
DS + Cited Reference + Contacting Authors + Iterative Search	1 (3)	

*Note.* N = 36