Qualitative Analysis Techniques for the Review of the Literature

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In this article, we provide a framework for analyzing and interpreting sources that inform a literature review or, as it is more aptly called, a research synthesis. Specifically, using Leech and Onwuegbuzie's (2007, 2008) frameworks, we delineate how the following four major source types inform research syntheses: talk, observations, drawings/photographs/videos, and documents. We identify 17 qualitative data analysis techniques that are optimal for analyzing one or more of these source types. Further, we outline the role that the following five qualitative data analysis techniques can play in the research synthesis: constant comparison analysis, domain analysis, taxonomic analysis, componential analysis, and theme analysis. We contend that our framework represents a first step in an attempt to help literature reviewers analyze and interpret literature in an optimally rigorous way. Keywords: Review of the Literature, Research Synthesis, Qualitative Analysis, Constant Comparison Analysis, Domain Analysis, Taxonomic Analysis, Componential Analysis, Theme Analysis

The literature review represents the most important step of the research process in qualitative, quantitative, and mixed research studies (Boote & Beile, 2005; Combs, Bustamante, & Onwuegbuzie, 2010; Onwuegbuzie, Collins, Leech, Dellinger, & Jiao, 2010). As noted by Boote and Beile (2005), "A thorough, sophisticated literature review is the foundation and inspiration for substantial, useful research. The complex nature of education research demands such thorough, sophisticated reviews" (p. 3). Moreover, Onwuegbuzie et al. (2010) identified 23 benefits that can be derived from conducting a quality review of the literature, such as the following: distinguish what has been undertaken and what needs to be undertaken, identify variables that are relevant to the topic, identify relationships between theory/concepts and practice, distinguish exemplary research, avoid unintentional and unnecessary replication, identify the main research methodologies and designs that have been utilized, identify contradictions and inconsistencies, and identify strengths and weaknesses of the various research approaches that have been utilized.

Unfortunately, many research textbooks give the impression that "writing a literature review is no more complicated than writing a high school term paper" (Boote & Beile, 2005, p. 5). According to Fraenkel and Wallen (2006), "A literature review is helpful in two ways. It not only helps researchers glean the ideas of others interested in a particular research question, but it also lets them read about the results of other (similar or related) studies" (p. 67). Fraenkel and Wallen (2006) present the following six "steps involved in a literature search":

1. Define the research problem as precisely as possible.
2. Look at relevant secondary sources.
3. Select and peruse one or two appropriate general reference works.
4. Formulate search terms (key words or phrases) pertinent to the problem or question of interest.
5. Search the general references for relevant primary sources.
6. Obtain and read relevant primary sources, and note and summarize key points in the sources. (p. 68)

Yet, these six steps are misleading because the literature review process represents much more than collecting and summarizing literature. Moreover, the literature review is a complex process that can be defined as "an interpretation of a selection of published and/or unpublished documents available from various sources on a specific topic that optimally involves summarization, analysis, evaluation, and synthesis of the documents" (Onwuegbuzie et al., 2010, p. 173). Machi and McEvoy (2009) provide another appropriately complex definition of a literature review, as follows:

A literature review is a written document that presents a logically argued case founded on a comprehensive understanding of the current state of knowledge about a topic of study. This case establishes a convincing thesis to answer the study's question. (p. 4)

Despite this complexity, most research methodology textbooks only devote at most one chapter to the literature review process (Onwuegbuzie & Leech, 2005). Encouragingly, some authors are beginning to acknowledge the complexity of the literature review process. In an attempt to demystify this process, very recently, these authors have written chapters and books that provide step-by-step guides to conducting literature reviews that begin to capture the critical and interpretive aspects of conducting a comprehensive literature review (Combs et al., 2010; Dellinger & Leech, 2007; Fink, 2009; Garrard, 2009; Hart, 2005; Leech, Dellinger, Brannagan, & Tanaka, 2010; Machi & McEvoy, 2009; Onwuegbuzie et al., 2010; Ridley, 2008). However, although these sources are useful, none of them provide explicit guidance as to how to formally analyze and interpret selected literature—two important components of the literature review process. We believe that this stems from the fact that the literature review process has not been considered as a methodological process in its own right. As such, compared to the number of books on research methodology, qualitative research, statistics, measurement, and the like, as noted by Boote and Beile (2005), there has been "a paucity of research and publications devoted to understanding it [what a literature review is]" (p. 5).

Although the authors of two methodological works in the area of literature reviews (i.e., Combs et al., 2010; Onwuegbuzie et al., 2010) incorporate the analysis and interpretation phases as explicit steps of their literature review process models, they do not provide details about how to undergo these phases. In fact, a recent comprehensive review of the literature revealed no article, chapter, or book in which explicit instructions were provided as how to analyze and to interpret selected literature using existing data analytic techniques. Thus, perhaps, it should not be surprising that a significant proportion of literature reviews in dissertations (Boote & Belie, 2005) and manuscripts submitted to journals for review for publication (Alton-Lee, 1998; Onwuegbuzie & Daniel, 2005) are underdeveloped. For example, Alton-Lee (1998), who examined reviewers' comments for 58 manuscripts submitted to *Teaching and Teacher Education* over a 1-year period (i.e., 142 reviews), reported that the criticisms associated with the literature review of these manuscripts were inadequate literature reviews (50.0%); theoretical flaws (53.4%); parochial focus (39.7%); failure to link findings to the extant literature (34.4%); and failure to contribute to international literature (36.2%). In addition, Onwuegbuzie and Daniel (2005), who examined 52 manuscripts submitted to the journal *Research in the Schools* over a 2-year period, documented that 40% of the submitted manuscripts contained inadequate literature reviews, and that the authors of these manuscripts were more than six times more likely to have their manuscripts rejected for publication than were authors of manuscripts containing adequate literature reviews.

As former editor (*Educational Researcher*), current editor (*Research in the Schools*), guest editors (e.g., *International Journal of Multiple Research Approaches*), and award-winning reviewers for multiple journals, our experience reading hundreds of literature reviews contained in manuscripts submitted to journals over the years has led us to conclude that a major reason for the underdevelopment of literature reviews stems from a lack of formal and systematic analysis of the extant literature. This lack of analysis often results in what Boote and Beile (2005) refer to as literature reviews that represent "mere disjointed summaries of a haphazard collection of literature" (p. 9).

According to Schwandt (2007), "To analyze means to break down a whole into its components or constituent parts. Through assembly of the parts, one comes to understand the integrity of the whole" (p. 6). Qualitative data analysis techniques lend themselves well to analyzing literature because, as noted by Onwuegbuzie et al. (2010), every selected literature—whether representing qualitative, quantitative, or mixed research—contains numerous sources of qualitative data (e.g., literature review of source article, conceptual/theoretical framework, author's interpretations, author's conclusion), thereby justifying within-case qualitative analyses. Further, when two or more sources are compared and contrasted—again, even if representing qualitative, quantitative, or mixed research—then, cross-case qualitative analyses are justified.

With this in mind, the purpose of this article is to provide a framework for analyzing and interpreting literature. Specifically, using the frameworks of Leech and Onwuegbuzie (2007, 2008), who outlined multiple ways of analyzing qualitative data, we identify the qualitative data analysis techniques that are optimal for analyzing target literature. We demonstrate how 17 qualitative data analysis techniques can be used to analyze literature. These 17 techniques were selected because either they represent the earliest formalized qualitative data analysis techniques (e.g., method of constant

comparison analysis; Glaser & Strauss, 1967; domain analysis, taxonomic analysis, componential analysis; Spradley, 1979), and/or they are extremely versatile in analyzing various forms of qualitative data (e.g., talk, observations, documents; e.g., qualitative comparative analysis; Ragin, 1987)—thereby facilitating the analyses of various types of data that might inform a literature review. Further, this number of techniques was chosen because they represent all but one of the qualitative analysis techniques identified and described by Leech and Onwuegbuzie (2008). These 17 techniques represent a diverse set of qualitative analysis techniques that offer the reviewer flexibility in analyzing information extracted from a literature review.

We contend that our framework represents a first step in an attempt to help reviewers analyze and interpret literature in an optimally rigorous way. We recognize that "rigorous" is a contested term, especially among qualitative researchers (for an excellent discussion, see, for e.g., Freeman, deMarrais, Preissle, Roulston, & St. Pierre, 2007). So, it is important that we define our position here. When we refer to the literature review as being "rigorous", we mean that it contains the following three attributes: warranted, transparent, and comprehensive. By using the terms *warranted* and *transparent*, we are being consistent with the two tenets for reporting on empirical social science research specified in the seminal document developed by the Task Force on Reporting of Research Methods in American Educational Research Association (AERA) Publications and adopted by the AERA Council in 2006. According to AERA (2006),

> First, reports of empirical research should be *warranted;* that is, adequate evidence should be provided to justify the results and conclusions. Second, reports of empirical research should be *transparent;* that is, reporting should make explicit the logic of inquiry and activities that led from the development of the initial interest, topic, problem, or research question; through the definition, collection, and analysis of data or empirical evidence; to the articulated outcomes of the study. (p. 33)

As noted by the authors of AERA (2006), "Reporting that takes these principles into account permits scholars to understand one another's work, prepares that work for public scrutiny, and enables others to use that work" (p. 33).

By *comprehensive*, we mean that from the literature review, researchers obtain a complete picture of "what has been conducted before, the inferences that have emerged, the inter-relationships of these inferences, the validity of these inferences, the theoretical and practical implications stemming from these inferences, and the important gaps in the literature" (Onwuegbuzie et al., 2010, p. 179), as well as positions them "to select the most appropriate methodologies for their studies by allowing them to identify the strengths and weaknesses of approaches used in previous studies" (p. 179). Consistent with our assertion of the importance of literature reviews being comprehensive, in referring to reporting the extant literature, the authors of AERA (2006) stated that "Reporting needs to provide as comprehensive a picture as possible of what the problem is about and how it has been approached" (p. 34).

Framework for Analyzing and Interpreting Literature

Within-Study Literature Analysis versus Between-Study Literature Analysis

Analysis of literature takes one of two forms: within-study literature analysis or a between-study literature analysis (Onwuegbuzie et al., 2010). Both types of analyses are essential and should be conducted in all literature reviews, except in the very rare occasion when the literature review involves a purposive selection of one work (e.g., single article, or book chapter), such that this work is not compared to any other work.

A within-study literature analysis involves analyzing the contents of a specific work. In its most rigorous and comprehensive form, a within-study literature analysis does not merely involve analyzing the findings of a study or the major premise used in a non-empirical work. Rather, optimally, it involves analyzing every component of the work, including the title, literature review section, conceptual framework/theoretical framework, procedures used, results section, and discussion section.

In contrast, a between-study literature analysis involves comparing and contrasting information from two or more literature sources. Although the most common information to compare is the findings among empirical works, optimally, every component, or at least multiple components, of a work should be compared with every/multiple components from other works.

Interestingly, if each work is viewed as a case, then—borrowing concepts of intrinsic case studies (i.e., studies designed to understand each particular [e.g., illustrative, deviant] case), instrumental case studies (i.e., studies designed to examine a particular case primarily to provide insight into an issue or to redraw a generalization), and multiple case studies (i.e., instrumental studies extended to several cases) from Stake (2005)—a within-study literature analysis can stem either from an *intrinsic literature analysis* or an *instrumental literature analysis*. In other words, a within-study literature analysis is pertinent whether each work is selected by the reviewer because in all its particularity and ordinariness, this work itself is of interest (i.e., intrinsic case study) *or* whether each work is important for synthesizing the existing body of knowledge, which then will be utilized for making inferences about the topic of interest.

Furthermore, it is important to analyze the entire work, including the introduction, literature review, methods, results, and discussion. Indeed, by not analyzing every component of a work, it is unlikely that the reviewer can adequately contextualize the findings reported in the work. Unfortunately, many reviewers merely summarize the work's findings reported in the results section and/or the major interpretation(s) of the author(s) (Boote & Beile, 2005) without placing the findings within the context of the remainder of the work (e.g., conceptual framework, theoretical framework, sample size, sampling scheme, analysis techniques used), thereby potentially distorting any ensuing synthesis of the selected works. Nor do these reviewers evaluate the quality of the work (e.g., adequacy of sample size, quality of data collected, appropriateness of procedures used) and contextualize the findings with respect to these quality criteria (Leech et al., 2010), compelling readers who are not previously familiar with the works presented in the literature review, and do not have the time to read the original works, to place equal weight on the findings stemming from each work. Thus, a within-study literature analysis helps to optimize the quality of the synthesis of selected works.

For example, if a reviewer conducts the most popular form of quantitative research synthesis—namely a meta-analysis, which involves estimating the mean effect size across the population of studies and studying the variability of effect sizes across studies as a function of study design effects (i.e., homogeneity analyses; Glass, 1976)—failure to conduct a within-study analysis could lead to a distorted synthesis of the effect size estimates. Similarly, failure to conduct a within-study analysis would misrepresent a synthesis stemming from a qualitative meta-analysis, more commonly known as a (qualitative) meta-synthesis, which, as defined by Sandelowski and Barroso (2003):

> is a form of systematic review or integration of qualitative research findings in a target domain that are themselves interpretive syntheses of data, including phenomenologies, ethnographies, grounded theories, and other integrated and coherent descriptions or explanations of phenomena, events, or cases. (p. 227)

Conversely, a between-study literature analysis is more likely to stem from a *multiple literature analysis*. In particular, typically, the larger the number of works selected for the literature review, the more a between-study literature analysis is needed to yield an appropriate synthesis. The distinction between these two types of literature analyses is important because certain qualitative analyses lend themselves more to within-study literature analysis than to between-study literature analysis, and vice versa.

A Reframing of the Literature Review Process

In 1665, Henry Oldenburg, Corresponding Secretary of the Royal Society, launched, at his own expense, the first academic journal in the English language, called the *Philosophical Transactions of the Royal Society*—approximately 200 years after print technology had first been introduced by Gutenberg and 30 years after King Charles I officially opened the royal postal service to the public in 1635 (Willinsky, 2005). This journal immediately became an avenue for scientific information. Thus, the review of literature has an official history of nearly 350 years. Despite its long history, the concept of the literature review still remains somewhat underdeveloped. As we stated previously, we believe that this underdevelopment in devising literature review procedures stems from the fact that the literature review process has not been considered as a methodological process in its own right. Rather, at best, for the most part, the review of the literature has been viewed as merely one step in the empirical research process rather than representing a study per se (Onwuegbuzie et al., 2010).

Of the relatively few published documents devoted exclusively to literature reviews, only a few provide any formal definition—including Boote and Beile's (2005) seminal article. Of those authors who do provide a formal, explicit definition of what a literature review is, "many present definitions that are overly simplistic or too narrow" (Onwuegbuzie et al., 2010, p. 171). With regard to *sources* that inform the literature review, Garrard (2009)—as do many others—provides a very narrow definition:

> the term *scientific literature* refers to theoretical and research publications in scientific journals, reference books, textbooks, government practice,

policy statements, and other materials about the theory, practice, and results of scientific inquiry. These materials and publications are produced by individuals or groups in universities, foundations, government research laboratories, and other nonprofit or for-profit organizations. [emphasis in original] (p. 4)

In contrast, Onwuegbuzie et al. (2010) provide a broader definition, by stating that the literature could represent any of the following sources: "research articles, opinion articles, essays, article reviews, monographs, dissertations, books, Internet websites, video, interview transcripts, encyclopedias, company reports, trade catalogues, government documents, congressional/parliamentary bills, popular magazines, and advertisements" (p. 173). However, this list of sources is insufficient and potentially misleading because it gives the impression—as do all published documents devoted exclusively to the topic of literature reviews—that literature review sources only stem from materials that already exist either in printed or digital forms. Yet, as surmised by Fink (2009), "A research literature review is a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work *produced by researchers, scholars, and practitioners*" [emphasis added] (p. 3). Thus, if researchers, scholars, and practitioners provide the body of literature that inform literature reviews, why should reviewers be limited to pre-existing print and digital sources? Why can't literature reviews also stem from other sources, such as directly from the researchers, scholars, and practitioners themselves? For example, why can't the literature review be informed via individual interviews or focus group interviews involving these researchers, scholars, and practitioners? Indeed, over the years, several of our student researchers have interviewed individuals who have contributed in some way to the body of work representing their topics of interest. Our student researchers have found, for example, that by interviewing leading researchers and scholars in the field, they gain insights about the topic that they could not have extracted from either the print or digital material. For instance, through interviews—whether conducted synchronously (e.g., face-to-face interviews, telephone interviews, Skype interviews, instant messenger, Second Life) or asynchronously (e.g., email, Facebook, MySpace.com, iTunes, iMovie, Youtube, Bebo, Friendster, Orkut, Flickr, Panoramio)—the interviewees have provided them with information about works/research that they are still writing/conducting or planning to write/conduct. Similarly, why can't literature review information be extracted from videotapes or from observations obtained directly by the reviewers themselves?

Thus, we believe that literature review sources should be expanded beyond pre-existing print and digital information. Leech and Onwuegbuzie (2008) presented a typology for qualitative data analysis wherein qualitative data were conceptualized as representing one of four major sources; namely, talk, observations, drawings/photographs/videos, and documents. We believe that all four source types serve as relevant literature review sources. Expanding the literature review process in this way opens the door for literature reviewers to analyze literature review sources in multiple ways.

It should be noted that although all four source types can and, where available and appropriate, should be used to inform literature reviews, each literature review source

should be evaluated for assessing the trustworthiness, dependability, credibility, legitimation, validity, plausibility, applicability, consistency, neutrality, reliability, objectivity, confirmability, and/or transferability as should any synthesis that emerge from its inclusion. Indeed, such a meta-evaluation should help the reviewer decide on (a) whether or not to include the source, (b) the weight to place on this source, and (c) how much meaning each source provides to the synthesis. Moreover, for all four source types, appropriate practices should be used. For example, when talk is used as a form of data that inform literature reviews, evidence-based interview practices for increasing representation and legitimation should be used such as member checking interviews (Lincoln & Guba, 1985) and debriefing interviews (Onwuegbuzie, Leech, & Collins, 2008).

Rationale for Using Multiple Source Types

Using Leech and Onwuegbuzie's (2007) conceptualization, we contend that there are two major goals for using multiple source types during the literature review process, namely *representation* and *legitimation*. Representation refers to the ability to extract adequate meaning from the information at hand. Using multiple source types allows the reviewer to combine the information from various sources in order to understand better the phenomenon. In other words, using multiple source types allows the reviewer to *get more out of the data*, thereby (potentially) generating more meaning and, in turn, enhancing the quality of syntheses. Indeed, using the seminal framework of Greene, Caracelli, and Graham (1989), there are four major ways in which representation can be enhanced by using multiple source types: between-source triangulation (i.e., seeking convergence and corroboration of information from different source types); between-source complementarity (i.e., seeking elaboration, enhancement, illustration, clarification of the information from one source type with information from another source type); between-source development (i.e., using the data from one source type to help inform data from another source type); and between-source expansion (i.e., seeking to expand the breadth and range of information by using different source types for different pieces of information). Consequently, using multiple source types can help reviewers to address what Marcus and Fischer (1986) refer to as the crisis of representation, namely, the difficulty in adequately describing and capturing social reality.

Legitimation refers to the credibility, trustworthiness, dependability, confirmability, and/or transferability of syntheses made (Denzin & Lincoln, 2005). As surmised by Onwuegbuzie and Leech (2004), lack of legitimation "means that the extent to which the data have been captured has not been adequately assessed, or that any such assessment has not provided support for legitimation" (p. 778). There are two major ways in which legitimation can be enhanced by using multiple source types: between-source triangulation (i.e., assessing level of convergence and corroboration of information extracted from different source types) and between-source initiation (i.e., discovering paradoxes and contradictions that lead to a re-framing of the synthesis). As such, using multiple source types can help reviewers to address what Denzin and Lincoln (2005) refer to as the crisis of legitimation, namely, the difficulty in assessing information.

Figure 1 presents a typology of reasons for using multiple source types. This figure maps the five purposes for using multiple sources that are based on Greene et al.'s

(1989) conceptualization onto the two major goals for using multiple source types. As illustrated by this figure, using multiple source types increases the rigor of literature reviews.

Figure 1. Typology of Reasons for Using Multiple Source Types
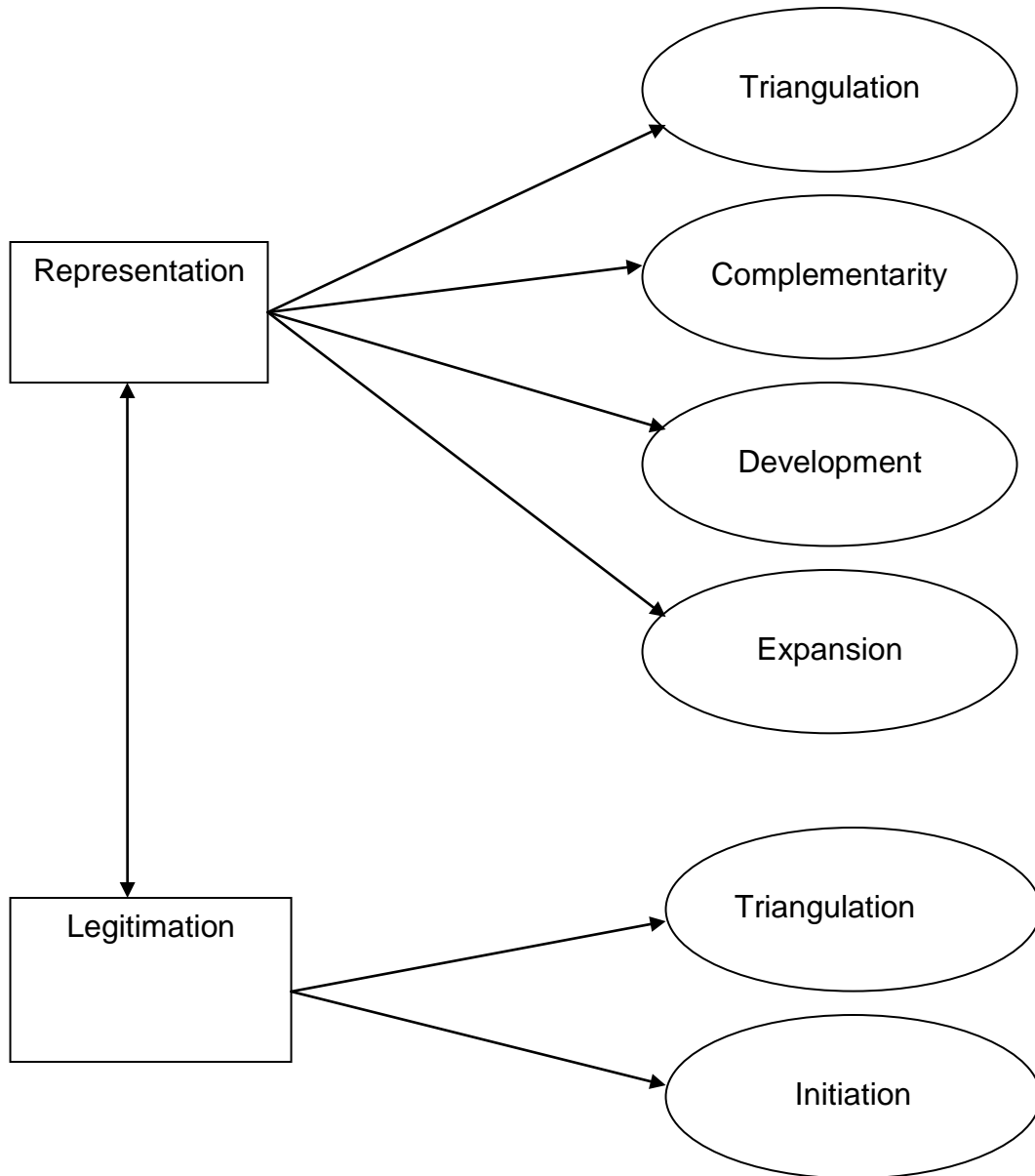
Note: Adapted from "An array of qualitative analysis tools: A call for data analysis triangulation," by N. L. Leech and A. J. Onwuegbuzie, 2007, *School Psychology Quarterly*, *22*, p. 580. Copyright 2007 by the American Psychological Association.

A Reframing of the Literature Review Analysis Process

Using the framework of Leech and Onwuegbuzie (2008) (see also Leech & Onwuegbuzie, 2007), we conceptualized that the following 17 qualitative data analysis techniques can be used to analyze literature: constant comparison analysis, keywords-in-context, word count, classical content analysis, domain analysis, taxonomic analysis, componential analysis, theme analysis, discourse analysis, secondary data analysis, membership categorization analysis, narrative analysis, qualitative comparative analysis, semiotics, manifest content analysis, text mining, and micro-interlocuter analysis. Table 1 presents the 17 qualitative data analysis techniques categorized by the four source types (i.e., talk, observations, drawings/photographs/videos, and documents). The definitions in existing publications devoted exclusively to the literature review process focus only on documents (i.e., print and digital) as sources for literature reviews. Yet, as we argued earlier, the categories of talk, observations, and drawings/photographs/videos also are relevant for conducting research syntheses. From Table 1, it can be seen that some techniques (e.g., constant comparative analysis, qualitative comparative analysis) can be utilized with multiple source types of information. Table 2 presents a list of the 17 qualitative data analysis techniques that can be used to facilitate analysis of information in literature reviews along with short descriptions.

In the following sections, we will show how these specific qualitative data analysis techniques (constant comparison analysis, and the four analyses comprising ethnographic analysis: domain analysis, taxonomic analysis, componential analysis, and theme analysis) can be used to analyze literature in a structured, systematic, and rigorous manner. These analytical techniques were selected because they represent the earliest formalized qualitative data analysis techniques, being conceptualized either in the 1960s (e.g., constant comparison analysis; Glaser & Strauss, 1967) or 1970s (i.e., domain analysis, taxonomic analysis, componential analysis, theme analysis; Spradley, 1979), and they represent the most commonly used analysis techniques (Leech & Onwuegbuzie, 2007). In addition, all of these analyses are explained in a step-by-step manner manually and via computer-assisted qualitative data analysis software (CAQDAS; i.e., NVivo, version 8.0; QSR International Pty Ltd., 2008 by Leech & Onwuegbuzie, 2007, and Leech & Onwuegbuzie, 2011), respectively.

Table 1. Relationship between Type of Qualitative Data Analysis Technique and Source of Information for Research Syntheses

Source of Information	Type of Qualitative Technique
Talk	Discourse Analysis
	Narrative Analysis
	Semiotics
	Qualitative Comparative Analysis
	Constant Comparison Analysis
	Keywords-in-Context
	Word Count
	Membership Categorization Analysis
	Domain Analysis
	Taxonomic Analysis
	Componential Analysis
	Theme Analysis
	Classical Content Analysis
Observations	Qualitative Comparative Analysis
	Constant Comparison Analysis
	Keywords-in-Context
	Word Count
	Domain Analysis
	Taxonomic Analysis
	Componential Analysis
	Theme Analysis
	Manifest Content Analysis
Drawings/Photographs/ Video	Qualitative Comparative Analysis
	Constant Comparison Analysis
	Word Count
	Manifest Content Analysis
	Secondary Data Analysis
Documents	Semiotics
	Qualitative Comparative Analysis
	Constant Comparison Analysis
	Keywords-in-Context
	Word Count
	Secondary Data Analysis
	Domain Analysis
	Taxonomic Analysis
	Componential Analysis
	Theme Analysis
	Classical Content Analysis
	Text Mining

Adapted from "Qualitative data analysis: A compendium of techniques for school psychology research and beyond," by N. L. Leech and A. J. Onwuegbuzie, 2008, *School Psychology Quarterly*, *23*, p. 590. Copyright 2008 by the American Psychological Association.

Table 2. Possible Qualitative Analyses for Research Syntheses[1]

Type of Analysis	Short Description of Analysis
Constant comparison analysis	Systematically reducing source(s) to codes inductively, then developing themes from the codes. These themes may become headings and subheadings in the literature review section.
Classical content analysis	Systematically reducing source(s) to codes deductively or inductively, then counting the number of codes.
Word count	Counting the total number of (key)words used or the number of times a particular word is used either during a within-study or between-study literature analysis.
Keywords-in-context	Identifying keywords and utilizing the surrounding words to understand the underlying meaning of the keyword in a source or across sources.
Domain analysis	Utilizing the relationships between symbols and referents to identify domains in a source(s).
Taxonomic analysis	Creating a classification system that categorizes the domains in a pictorial representation (e.g., flowchart) to help the literature reviewer understand the relationships among the domains.
Componential analysis	Using matrices and/or tables to discover the differences among the subcomponents of domains.
Theme analysis	Involves a search for relationships among domains, as well as a search for how these relationships are linked to the overall cultural context.
Discourse analysis	Selecting representative or unique segments of language use, such as several lines of an interview transcript involving a researcher, and then examining the selected lines in detail for rhetorical organization, variability, accountability, and positioning. This analysis is particularly useful when reviewing literature review sections of empirical articles, literature review articles, theoretical/conceptual articles, and methodological articles.
Secondary data analysis	Analyzing pre-existing sources or artifacts.
Membership categorization analysis	Examining how authors/researchers communicate research terms, concepts, findings, and categories in their works.
Semiotics	Using talk and text as systems of signs under the assumption that no meaning can be attached to a single term. This form of analysis shows how signs are interrelated for the purpose of creating and excluding specific meanings.
Manifest content analysis	Describing observed (i.e., manifest) aspects of communication via objective, systematic, and empirical means.
Qualitative comparative analysis	Systematically analyzing similarities and differences across sources, typically being used as a theory-building approach, allowing the reviewer to make connections among previously built categories, as well as to test and to develop the categories further. This analysis is particularly useful for assessing causality in findings across sources.
Narrative analysis	Considering the potential of stories to give meaning to research findings, and treating data as stories, enabling reviewers to reduce data to a summary.
Text mining	Analyzing naturally occurring text within multiple sources in order to discover and capture semantic information.
Micro-interlocutor analysis	Analyzing information stemming from one or more focus groups of researchers, scholars, or practitioners about which participant(s) responds to each question, the order that each participant responds, the characteristics of the response, the nonverbal communication used, and the like.

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[1] Adapted from "Qualitative data analysis: A compendium of techniques for school psychology research and beyond," by N. L. Leech and A. J. Onwuegbuzie, 2008, *School Psychology Quarterly*, *23*, p. 601. Copyright 2008 by the American Psychological Association.

Qualitative Analysis Techniques for Analyzing Literature

Constant comparison analysis. Glaser and Strauss (Glaser, 1978, 1992; Glaser & Strauss, 1967; Strauss, 1987), the developers of grounded theory (Glaser & Strauss, 1967), are credited with creating constant comparison analysis. According to Strauss and Corbin (1998), constant comparison analysis has five major characteristics: (a) to build theory—as opposed to testing it; (b) to provide researchers with analytic tools for analyzing data; (c) to assist researchers in understanding multiple meanings from data; (d) to provide researchers with a systematic and creative process for analyzing data; and (e) to assist researchers in identifying, creating, and seeing the relationships among components of the data when constructing a theme.

Constant comparison analysis originally was developed for grounded theory research to analyze data that were collected over a series of stages, specifically an *open coding* stage (wherein data are chunked into smaller segments that are all given a descriptor, or code), an *axial coding* stage (wherein codes are grouped into similar categories), and a *selective coding* stage (wherein the theory is integrated and refined), respectively, in order to "create theory out of data" (Strauss & Corbin, 1998, p. 56). However, as noted by Leech and Onwuegbuzie (2007), "constant comparison analysis since has been modified to be used to analyze data collected in one round (e.g., single round of interviews)" (p. 565), and even can be used to analyze a single document from a single case (i.e., within-case analysis). Moreover, constant comparison analysis "can be utilized with talk, observations, drawings/photographs/video, and documents" (Leech & Onwuegbuzie, 2008, p. 594)—making it an extremely versatile analytical technique.

Documents. To perform a constant comparison analysis of text in printed (e.g., set of printed articles on a topic that was identified from standard bibliographic databases) or digital form (e.g., set of electronic articles), the literature reviewer first reads through the entire set of information (whole works: preferred strategy) or subset of the information (e.g., results section of works: non-optimal strategy) one unit (e.g., work; section of work) at a time. Next, the reviewer chunks the information into smaller, meaningful parts. Then, the reviewer labels each chunk with a descriptive label or a *code*. The reviewer then systematically compares each new chunk of data (e.g., work; section of work) with previous codes, such that similar chunks are labeled with the same code. After all the information has been coded, the codes are clustered by similarity, and a theme is identified and described based on each cluster. In writing the literature review section, the reviewer might use each theme to inform a paragraph or even a (whole) section, with each theme label (or its variant) providing the name of the section or sub-section. As is the case for grounded theory, data saturation, informational redundancy, and/or theoretical saturation is reached when no new or relevant information seems to emerge pertaining to a category, and the category development is well established and validated (Flick, 1998; Lincoln & Guba, 1985; Morse, 1995; Strauss & Corbin, 1990). For example, when examining the reference list of each work (printed or digital), saturation might be reached when each subsequent reference list reveals no new significant reference on the topic. In the context of the Results section, saturation might be reached when no new findings emerge in subsequent results sections. In the context of the Method section, saturation might be reached when no new instruments or procedures

emerge in subsequent Method sections. Finally, in the context of the Introduction section, saturation might be reached when no new conceptual frameworks or theoretical frameworks emerge in subsequent Introduction sections.

For instance, Frels (2010) used constant comparison analysis to analyze the selected literature on school-based mentoring (a formal mentoring relationship wherein adult mentors are matched with students [mentees] with the goal of facilitating academic performance and improving students' overall attitudes toward school; Herrera, Grossman, Kauh, Feldman, & McMaken, 2007; Karcher & Herrera, 2008), whereby she coded particular themes regarding school-based mentoring relationships, support for mentors, and contributions to the field of mentoring. As an example of her use of constant comparison analysis, Frels coded incidences of direct support for both the mentor and the dyadic relationship. This analysis revealed that the majority of school-based mentoring programs that she deemed to represent activity-based models of mentoring included elements of *direct support* for dyadic mentoring relationships. According to Frels, characteristics of direct support represent *inputs*, which are mentoring program components that emphasize elements such as specific training or activities in mentoring or targeted particular outcomes for the mentee. Table 3 illustrates themes of direct support in mentoring programs. Frels concluded "that the majority of directive (tangible) program inputs appear to be focused on supporting mentors, who might, in turn, be encouraged to undertake more effective mentoring" (p. 82).

Photographs/Video. To perform a constant comparison analysis of drawing/photographs/videos, each image or frame is examined and coded, codes are chunked, chunks clustered, and chunks labeled as themes until data saturation, informational redundancy, and/or theoretical saturation is reached. Conveniently, some CAQDAS (e.g., QDA Miner 4.0) facilitate the coding of drawing, photographs, paintings, and other types of visual documents. Other programs (e.g., Transana, Atlas.ti) facilitate the coding of audio and video data.

Observations. As part of the research synthesis, a reviewer might collect relevant observational data. For example, in conducting a research synthesis on school violence in general and its long-term effects in particular, in order to observe some context first-hand, a reviewer might travel to Columbine High School, in Littleton, Colorado, where 12 students and a teacher were killed and 23 were wounded during an assault with guns and explosive devices by two of its students before they took their own lives on April 20, 1999. Constant comparative analysis then could be used to analyze such observational data. Once the observations have been documented in some manner, the information then could be coded and chunked, and then the chunked codes could be organized into themes that could be used to generate new theory or, more typically, to support or refute initial codes that have been extracted from other sources (e.g., extant print or digital literature)—as part of the selective coding research synthesis stage. It might be argued that there is some overlap between the data sources labeled as observations and photographs/videos—for example, photographs and/or videos might be used as a process of collecting observations, analyzing often can lend itself to different qualitative analyses than do photographs/videos in much the same way that some CAQDAS software programs are more appropriate for helping to facilitate the analysis of photographs/videos

(e.g., Transana), whereas other CAQDAS software programs are more appropriate for helping to facilitate the analysis of other sources of data such as text (e.g. NVivo, QDA Miner).

Talk. As noted earlier, an extremely effective but underutilized research synthesis strategy is to interview key researchers, scholars, and/or practitioners. For instance, returning to the example of a research synthesis on school violence, the reviewer could interview one or more leading researchers/scholars on school violence and/or a leading administrator of a violence prevention program. These interviewees would serve as key informants. In particular, interviewing leading researchers/scholars could lead to a form of member checking, wherein the reviewer asks the key informants to assess whether the themes, arguments, or assertions developed from the codes are describing accurately their statements (Lincoln & Guba, 1985), thereby increasing the descriptive validity of the research synthesis (Maxwell, 1992, 1996, 2005). These member checking interviews also could provide an additional way to assess saturation. From these interviews, vital new information might emerge that would inform the research synthesis. For example, a researcher might reveal new completed manuscripts that she/he has not yet had published (and thus cannot be extracted from any bibliographic database) or unpublished manuscripts that are still being written. In any case, after the talk has been transcribed, the words can be coded and chunked, and then the chunked codes could be organized into themes.

Frels' (2010) dissertation provides a powerful example of the benefit of the reviewer not relying only on the extant print and digital literature but supplementing information from this traditional source by collecting information from *talk*. Specifically, Frels (2010) conducted a qualitative investigation wherein her threefold purposes were (a) to explore selected mentors' perceptions of experiences of the dyadic mentoring relationship in school-based mentors; (b) to examine the perceptions of selected school-based mentors regarding roles, expectations, purposes, and approaches of mentoring; and (c) to investigate the actual experiences of selected school-based mentors with the dyadic relationship. As an important part of her literature review, she contacted via email correspondence three prolific authors/researchers who were experts in the area of mentoring. Each of these authors/researchers kindly agreed to be interviewed and provided valuable information related to her research topic of school-based mentoring. In addition, Frels (2010) used Skype to interview a prolific author/researcher/methodologist for insights with respect to evaluating the literature that she had selected. She transcribed each of the interviews and analyzed each set of interview data using constant comparison analysis. As such, she was able to integrate each interviewee's expertise with information with the extant print and digital literature. Across this set of four interviewees, Frels obtained information that, compared to the extant print and digital literature, represented all five purposes for using multiple sources that are based on Greene et al.'s (1989) conceptualization, namely: triangulation, complementarity, development, expansion, and initiation. More importantly, Frels (2010) was able to use the talk data to enhance both representation and legitimation.

Table 3. *Themes of Direct Support for Mentoring Programs from Models*

Program Input	Type of Support
Fewer obstacles for mentoring time	Mentor support
Structuring activities	Mentor support
Administration/program contact	Mentor support
Keeping program small and manageable	Mentor support
Training that is understood and used by mentor	Mentor support
On-going training	Mentor support
Supervision	Mentor support
Lessons in career/social skills	Mentor support
Focus on goal-setting	Mentor support Dyadic relationship support
Emphasis on Best Practices	Mentor support Dyadic relationship support
Promoting positive development	Dyadic relationship support
Development of identity	Dyadic relationship support
Use of developmentally appropriate activities	Dyadic relationship support
Structuring meeting times that are convenient in the school day	Dyadic relationship support

Ethnographic analysis. Ethnographic analysis, which was created by Spradley (1979), comprises four components: (a) domain analysis; (b) taxonomic analysis; (c) componential analysis; and (d) theme analysis. Spradley developed these four components to "have a single purpose: to uncover the system of cultural meanings that people use" (p. 94). Indeed, ethnographic analyses stem from the assumption that informants have cultural knowledge, and by examining systematically an informant's words (i.e., folk terms) and context, one can see the relationships among the parts. It is by examining these parts that the researcher understands the overall culture of the informant.

Because the field of research is a culture that contains many subcultures (e.g., quantitative research culture, qualitative research culture, mixed research culture, teacher efficacy culture), we believe that the research synthesis process aptly lends itself to ethnographic analysis. According to Spradley (1979), the most important aspect of this process is the focus on going back to the informants to ask questions. In the context of the research synthesis, the informants are the researchers, scholars, and practitioners who have contributed most to the knowledge base. The questions posed to these key informants are used to facilitate the syntheses.

Ethnographic analyses, in its fullest form, contain the following four qualitative data analysis techniques that are best conducted in the following order: domain analysis, taxonomic analysis, componential analysis, and theme analysis. As outlined by Spradley (1979), each subsequent analysis is informed by the preceding analyses. Each of these analyses is described below with an outline of how it can be used to enhance research syntheses.

Domain analysis. Domain analysis is the first type of analysis to be undertaken in the ethnographic analysis sequence. This form of ethnographic analysis involves a search for the larger units of cultural knowledge, which Spradley (1979) called domains. Thus, the goal of a domain analysis is to understand better the domain. Specifically, domain analysis starts with examining symbols because of the belief that symbols are an essential way of communicating cultural meaning. Every culture—including the research culture and numerous research subcultures—has symbols or elements that represent other items. Symbols have three components: (a) the symbol itself (i.e., cover term); (b) one or more referents (i.e., to what the symbol refers; included term); and (c) a relationship between the symbol and the referent (i.e., semantic relationship). In other words, domains are created from (a) cover terms (concepts; Y); (b) included terms (referents; X); and (c) a semantic relationship between the cover term (Y) and the included terms (X). To understand the symbol, it is necessary for the researcher to analyze the relationship of the symbol to the referents. This is undertaken by examining semantics. Spradley (1979) conceptualized that domain analysis involves a six-step process:

1. Select a single semantic relationship (repeated).
2. Prepare a domain analysis worksheet (repeated).
3. Select a sample of informant statements (repeated).
4. Search for possible cover terms and included terms that fit the semantic relationship (repeated).
5. Formulate structural questions for each domain (repeated).
6. Make a list of all hypothesized domains.

At the conclusion of this process, the researcher labels each domain. Casagrande and Hale (1967) identified 13 types of semantic relationships. These semantic relationships are presented in Table 4. Building on Casagrande and Hale's (1967) work, Spradley (1979) posited that nine types of semantic relationships are particularly useful for analyzing semantic domains, which are displayed in Table 5. Casagrande and Hale's (1967) and Spradley's (1979) relationships serve as the core of domain analysis.

We believe that Casagrande and Hale's (1967) and Spradley's (1979) types of relationships are extremely useful for research syntheses, and particularly useful for analyzing empirical research findings. For example, the types of relationships summarized in Table 5 can be used to distinguish causal relationships (i.e., "X is a result/cause of Y") from other types of relationships or patterns. As per Step 5 of the domain analysis process, domain analysis leads to further structural questions (e.g., "How is X a cause of Y?"; "How is X an attribute of Y?"), which might be addressed by revisiting old sources or consulting new sources. Or, consistent with our calls for expanding the source types of information that inform research syntheses, the reviewer could interview key informants (researchers, scholars, and practitioners) to obtain their responses to the structural questions. As such, domain analysis provides an alternative lens with which to analyze various source types in a research synthesis. Indeed, as can be seen from Table 1, domain analysis can be used for three of the four source types that inform research syntheses.

Taxonomic analysis. Although domain analysis can be conducted by itself, it can be combined with taxonomic analysis, which is the second step in the ethnographic analysis process. Once research synthesis domains have been identified, taxonomic analysis can be employed by selecting one domain and placing it into a taxonomy. Spradley (1979, 1997) defines a taxonomy as a *classification system* that inventories the domains into a flowchart or other pictorial representation to help the researcher understand the relationships among the domains. Thus, as is the case for domain analysis, a taxonomic analysis is characterized as a set of categories that are organized on the basis of a single semantic relationship. However, unlike a domain analysis, a taxonomic analysis, via a taxonomy, exhibits the relationships among all the terms in a domain. Moreover, a taxonomic analysis depicts the hierarchical structure of the terms representing a domain, by indicating the subsets of terms and the relationship of these subsets to the domain as a whole (Spradley, 1979). According to Spradley, a taxonomic analysis involves the following eight steps:

Table 4. Casagrande and Hale's (1967) Types of Relationships for Domain Analysis

Type	Relationship of X and Y
Attributive	X defined with respect to one or more attributes of Y
Contingency	X is defined as with relation to an antecedent or concomitant of Y
Function	X is defined as the means of effecting Y
Spatial	X is oriented spatially with respect to Y
Operational	X is defined with respect to an action of Y of which it is a goal or recipient
Comparison	X is defined in terms of its similarity or contrast with Y
Exemplification	X is defined by citing an appropriate co-occurrent Y
Class inclusion	X is defined with respect to its membership in a hierarchical class Y
Synonymy	X is defined as an equivalent to Y
Antonymy	X is defined as the negation of Y
Provenience	X is defined with respect to its source Y
Grading	X is defined with respect to its placement in a series or spectrum that also includes Y
Circularity	X is defined as X

Adapted from Casagrande and Hales (1967).

Table 5. Spradley's (1979) Types of Relationships for Domain Analysis

Type	Relationship of X and Y
Strict inclusion	X is a kind of Y
Spatial	X is a place in Y, X is a part of Y
Cause-effect	X is a result/cause of Y
Rationale	X is a reason for doing Y
Location for action	X is a place for doing Y
Function	X is used for Y
Means-end	X is a way to do Y
Sequence	X is a step (stage) in Y
Attribution	X is an attribute of Y

1. Select a domain for the taxonomic analysis.
2. Identify the appropriate substitution frame for analysis (a substitution frame [e.g., is an attribute of] is similar to a semantic relationship, although it differs in   that it helps to differentiate the included terms into subgroups).
3. Search for possible subsets among the included terms.
4. Search for larger, more inclusive domains that might include as a subset the one being analyzed.
5. Construct a tentative taxonomy.
6. Formulate structural questions to verify taxonomic relationships.
7. Conduct additional structural interviews.
8. Construct a completed taxonomy.

As can be seen, as is the case for domain analysis, taxonomic analysis leads to further structural questions. After these questions are answered, the reviewer can refine the taxonomy and use it in the report (i.e., literature review section) to help the reader understand the phenomenon of interest.

Leech and Onwuegbuzie (2010) provide an example of a taxonomy that arose from a taxonomic analysis. These authors conducted an extensive research synthesis, which included interviewing several of the leading scholars from the mixed research field, in order to identify the best practices for conducting and writing mixed research at

every step of the mixed research process. These authors could have written the synthesis (i.e., literature review) using prose, which is the traditional way. However, a taxonomy was created because the domains (i.e., steps of the mixed research process) pertaining to the best practices for conducting and writing mixed research could be arranged into a *classification system* that inventories the domains into a diagram to help readers understand the relationships among them (Spradley, 1979, 1997). Table 6 presents a portion of the published table. This table is divided into supertype-subtype relationships, which also are known as generalization-specialization or parent-child relationships. Here the three supertypes are represented by the three stages of the mixed research process, namely the research formulation stage, the research planning stage, and the implementation stage. In contrast, the subtypes are represented by the 13 steps of the mixed research process. These are:

(1) determining the mixed goal of the study;
(2) formulating the mixed research objective(s);
(3) determining the rationale of the study and the rationale(s) for mixing quantitative and qualitative approaches;
(4) determining the purpose of the study and the purpose(s) for mixing quantitative and qualitative approaches;
(5) determining the mixed research question(s);
(6) selecting the mixed sampling design;
(7) selecting the mixed research design;
(8) collecting quantitative and/or qualitative data;
(9) analyzing the quantitative and/or qualitative data using quantitative and/or qualitative analysis techniques;
(10) validating/legitimating the mixed research findings;
(11) interpreting the mixed research findings;
(12) writing the mixed research report; and
(13) reformulating the mixed research question(s).

There are also sub-subtypes, which are the specific guidelines for conducting/writing a mixed research manuscript. Thus, for example, the taxonomic category of 2.2.1 is *Outline the mixed research design*. Here, the 2.2.1 represents the second stage of the mixed research process (i.e., research planning), the second of two steps within the research planning stage, and the first guideline of the research design step of the research planning phase. This taxonomy is a clear and efficient way to synthesize the literature on best practices for conducting and writing mixed research. Indeed, using prose to synthesize these best practices would have taken up much more space in the article and, more importantly, might have overwhelmed readers. As such, taxonomies represent cognitive load-reducing methods for synthesizing knowledge. It can be seen from Table 1 that taxonomic analysis can be used for three of the four source types that inform research syntheses.

Componential analysis. Although componential analysis can be conducted by itself, it can be combined with domain analysis and taxonomic analysis, which, as noted previously, are the first and second steps of the ethnographic analysis process. According

to Spradley (1979), componential analysis is a "systematic search for attributes (components of meaning) associated with cultural symbols" (Spradley, 1979, p. 174). Here, matrices and/or tables are used to determine the differences among the subcomponents of domains in order to "map as accurately as possible the psychological reality of our informant's cultural knowledge" (Spradley, 1979, p. 176). Typically, tables have at least two dimensions: (a) *the contrast set*; and (b) *dimensions of contrast*. The contrast set is a set of attributes or components of meaning for any term, whereas the dimensions of contrast are questions formulated by the researcher to help differentiate the contrast set. Each question needs to be constructed in such a way that the possible responses are either *yes* or *no*. As conceptualized by Spradley (1979), a componential analysis involves the following eight steps:

1. Select a contrast set for analysis.
2. Inventory all contrasts previously discovered.
3. Prepare a paradigm worksheet.
4. Identify dimensions of contrast which have binary values.
5. Combine closely related dimensions of contrast into ones that have multiple values.
6. Prepare contrast questions to elicit missing attributes and new dimensions of contrast.
7. Conduct an interview to elicit needed data.
8. Prepare a completed paradigm.

Componential analysis lends itself to the research synthesis process. Indeed, this analysis would lead the reviewer to create structural questions to fill in gaps in understanding the contrast set. As such, reviewers can collect interview, observational, or visual data to address these structural questions. It can be seen from Table 1 that componential analysis can be used for three of the four source types that inform research syntheses.

Theme analysis. The final analysis in the ethnographic process is theme analysis. This analysis is conducted by developing themes that "go beyond such an inventory [of domains] to discover the conceptual themes that members of a society use to connect these domains" (Spradley, 1979, p. 185). More specifically, a theme analysis involves a search for relationships among domains, as well as a search for how these relationships are linked to the overall cultural context. Like a constant comparison analysis, the reviewer might use each theme that is extracted from a theme analysis to inform a paragraph or even a (whole) section, with each theme label (or its variant) providing the name of the section or sub-section. It can be seen from Table 1 that theme analysis can be used for three of the four source types that inform research syntheses.

Table 6. Example of a Taxonomy: Guidelines for Reporting on Writing a Mixed
Research Manuscript for Counselor Researchers

1. Research Formulation	
1.1.1.	Treat each relevant article as data that generate both *qualitative* (e.g., qualitative findings, literature review of source article, source article author's conclusion) and *quantitative* (e.g., *p*-values, effect sizes, sample size score reliability, quantitative results) information that yields a mixed research synthesis.
1.1.2.	Subject each document selected as part of the literature review to summarization, analysis, evaluation, and synthesis.
1.1.3.	Provide literature reviews that are comprehensive, current, and rigorous; that have been compared and contrasted adequately; and that contain primary sources that are relevant to the research problem under investigation, with clear connections being made between the sources presented and the present study.
1.1.4.	Present clearly the theoretical/conceptual framework.
1.1.5.	Assess the findings stemming from each individual study and the emergent synthesis for trustworthiness, credibility, dependability, legitimation, validity, plausibility, applicability, consistency, neutrality, reliability, objectivity, confirmability, and/or transferability.
1.1.6.	Present the goal of the study (i.e., predict; add to the knowledge base; have a personal, social, institutional, and/or organizational impact; measure change; understand complex phenomena; test new ideas; generate new ideas; inform constituencies; and examine the past).
1.2.1.	Specify the objective(s) of the study (i.e., exploration, description, explanation, prediction, and influence).
1.3.1.	Specify the rationale of the study.
1.3.2.	Specify the rationale for combining qualitative and quantitative approaches (i.e., participant enrichment, instrument fidelity, treatment integrity, and significance enhancement).
1.4.1.	Specify the purpose of the study.
1.4.2.	Specify the purpose for combining qualitative and quantitative approaches (e.g., identify representative sample members, conduct member check, validate individual scores on outcome measures, develop items for an instrument, identify barriers and/or facilitators within intervention condition, evaluate the fidelity of implementing the intervention and how it worked, enhance findings that are not significant, compare results from the quantitative data with the qualitative findings).
1.5.1.	Avoid asking research questions that lend themselves to "yes/no" responses.
1.5.2.	Present mixed research questions (i.e., questions that embed both a quantitative research question and a qualitative research question within the same question), when possible.
2. Research Planning	
2.1.1.	Specify the initial and final sample sizes for all quantitative and qualitative phases of the study.
2.1.2.	Present all sample size considerations made for the quantitative phase(s) (i.e., a priori power analysis) and qualitative phases (e.g., information-rich cases).
2.1.3.	Present the sampling scheme for both the quantitative and qualitative phases of the study.
2.1.4.	Describe the mixed sampling scheme (i.e., concurrent-identical, concurrent-parallel, concurrent-nested, concurrent-multilevel, sequential-identical, sequential-parallel, sequential-nested, and sequential-multilevel).
2.1.5.	Clarify the type of generalization to be made (i.e., statistical generalization, analytic generalization, and case-to-case transfer) and link it to the selected sampling design, sampling scheme, and sample size(s).
2.2.1.	Outline the mixed research design.
2.2.2.	Specify the quantitative research design (i.e., historical, descriptive, correlational, causal-comparative/quasi-experimental, and experimental).
2.2.3.	Specify the qualitative research design (e.g., biography, ethnographic, auto-ethnography, oral history, phenomenological, case study, grounded theory).

Conclusion

In this article, we contended that existing definitions of literature reviews are inadequate and potentially misleading because these definitions convey the impression that literature review sources only stem from materials that already exist either in printed or digital forms. Therefore, we have provided a framework for analyzing and interpreting sources that inform a literature synthesis comprising the following four major source types to inform research syntheses: talk, observations, drawings/photographs/videos, and documents, and we have identified 17 qualitative data analysis techniques that are optimal for analyzing one or more of these source types. Further, we outlined the role that the following five qualitative data analysis techniques can play in the research synthesis: constant comparison analysis, domain analysis, taxonomic analysis, componential analysis, and theme analysis.

Because constant comparison analysis is used frequently to analyze various types of qualitative data (Leech, 2004), we illustrated how this data analysis technique can be used to analyze various types of information extracted by a literature reviewer. Similarly, we illustrated how all four types of ethnographic analyses can individually or as a whole play a vital role in the research synthesis process. As noted by Leech and Onwuegbuzie (2008),

> domain analysis, taxonomic analysis, componential analysis, and theme analysis can be used in combination as a form of data analysis triangulation. That is, the findings stemming from two or more of these analysis stages can be compared to ascertain the extent to which findings from one analysis stage confirms those arising from another stage. (p. 596)

Like Leech and Onwuegbuzie (2008), we encourage literature reviewers to consider using multiple qualitative data analysis techniques so that they can get more out of their research syntheses.

We contend that our framework represents a first small step in an attempt to help student researchers and more experienced researchers to analyze and to interpret literature in an optimally rigorous way. Indeed, our conceptualization goes far beyond the current operationalization of literature reviews that prevails in sources detailing the literature review process, such as articles and books. As such, we conclude this article by proposing a final recommendation that the terms *literature review* and *review of the literature* be replaced with the term *research synthesis*. This recommendation stems from the fact that the first two terms connote that only literature is examined, thereby promoting a parochial view of the literature review process. We have presented a framework that expands this narrow interpretation, thereby providing support for utilizing the term *research synthesis*.

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