# An Array of Qualitative Data Analysis Tools: A Call for Data Analysis Triangulation

**Nancy L. Leech**
*University of Colorado at Denver and Health Sciences Center*

**Anthony J. Onwuegbuzie**
*Sam Houston State University*

*One of the most important steps in the qualitative research process is analysis of data. The purpose of this article is to provide elements for understanding multiple types of qualitative data analysis techniques available and the importance of utilizing more than one type of analysis, thus utilizing data analysis triangulation, in order to understand phenomenon more fully for school psychology research and beyond. The authors describe seven qualitative analysis tools: methods of constant comparison, keywords-in-context, word count, classical content analysis, domain analysis, taxonomic analysis, and componential analysis. Then, the authors outline when to use each type of analysis. In so doing, the authors use real qualitative data to help distinguish the various types of analyses. Furthermore, flowcharts and tables are provided to help delineate when to choose each type of analysis. Finally, the role of computer-assisted software in the qualitative data-analytic process is discussed. As such, use of the analyses outlined in this article should help to promote rigor in qualitative research.*

In the field of psychology, since the 1960s, qualitative research approaches have been used by researchers to obtain "a more *naturalistic,*

Nancy L. Leech, PhD, is an assistant professor in the Research and Evaluation Program in the Division of Education Psychology at the University of Colorado at Denver and Health Sciences Center. Her area of research is promoting new developments and better understandings in applied qualitative, quantitative, and mixed methodologies. Dr. Leech has received several outstanding paper awards, including the Southwest Educational Research Association (SERA) Outstanding Paper Award in 2003 and 2004 and the Mid-South Educational Research Association (MSERA) Outstanding Paper Award in 2004. In 2004 and 2005, Dr. Leech was awarded the Outstanding Researcher Award from the School of Education and Human Development at the University of Colorado at Denver and Health Sciences Center. She received her PhD from Colorado State University.

*contextual* and *holistic understanding* of human beings in society" (Todd, Nerlich, & McKeown, 2004, p. 4; emphasis in original). These approaches have focused on studying phenomena in their natural settings and striving to make sense of or interpreting phenomena with respect to the meanings people bring to them (Banister, Burman, Parker, Taylor, & Tindal, 1994; Denzin & Lincoln, 2005a). Qualitative research has particular appeal for the field of school psychology. As noted by Nastasi and Schensul (2005), qualitative research techniques are essential for

> documenting the adaptations necessary for application of interventions to real-life contexts and for identifying core intervention components which are related to desired outcomes. Furthermore, qualitative methods can help researchers to describe various manifestations of intended outcomes that may not be reflected in standardized instruments and to identify unintended positive or negative outcomes for the individual and institution/community (p. 187).

Further, qualitative research is extremely useful for obtaining insights into regular or problematic experiences and the meaning attached to these experiences of selected individuals (e.g., biography, auto-biography, case study, oral history, life history, auto-ethnography) and groups (e.g., ethnography, phenomenology, grounded theory, critical theory), which, under certain conditions (e.g., data saturation, theoretical saturation, informational redundancy), can achieve *Verstehen* or understanding (Bogdan & Biklen, 2003; Onwuegbuzie & Leech, 2007a). For example, a case study (i.e., formal study to understand issues intrinsic to the person, group, event, etc.; Stake, 2005) can be used to examine a construct of interest to a school psychologist (e.g., autism, bipolar disorder, depression, bullying) as it manifests itself on a particular individual or group of individuals. An ethnographic study (i.e., "process and product of describing cultural behavior"; Schwandt, 2001, p. 44) can be used to describe and interpret the cultural behaviors, customs, and experiences of children with special needs. A phenomenological inquiry (i.e., study to describe the meaning of the lived experiences for selected individuals; Creswell, 2007) can be utilized to describe the meaning of the lived experiences for victims of bullying.

Anthony Onwuegbuzie is professor in the Department of Educational Leadership and Counseling at Sam Houston State University. He teaches courses in qualitative research, quantitative research, and mixed methods. His research topics primarily involve disadvantaged and under-served populations such as minorities, children living in war zones, students with special needs, and juvenile delinquents. He also writes extensively on methodological topics. In addition to 2 books, he has had published more than 200 articles in refereed journals and book chapters. Also, he has made more than 380 presentations and keynote addresses at regional, national, and international conferences. Presently, he serves as a co-editor of *Research in the Schools* (a nationally/internationally refereed journal) and editor of the *Research News and Comments* section of *Educational Researcher*. He has received numerous outstanding paper awards, including the Literati Club Award for Excellence 2003, an International Award.

Correspondence concerning this article should be addressed to Nancy L. Leech, University of Colorado at Denver, School of Education, Campus Box 106, P.O. Box 173364, Denver, CO 80217. E-mail: nancy.leech@cudenver.edu

Grounded theory research (i.e., study using rigorous set of procedures to produce substantive theory of social phenomena; Glaser & Strauss, 1967) could be employed to generate or expand a theory of hope or another positive psychological construct. Regardless of the research design or method used, qualitative research can inform theory and model development, if it is conducted in a way that leads to insights into particular psychological, social, and/or cultural processes and practices that exist within a specific setting, location, time, context, event, incident, activity, and/or experience (Connolly, 1998; Onwuegbuzie & Leech, 2004).

Quantitative research is most helpful when "answering questions of who, where, how many, how much, and what is the relationship between specific variables" (Adler, 1996, p. 5). However, quantitative research is not apt for answering *why* and *how* questions. In contrast, qualitative research can address such process-oriented questions. Another limitation of quantitative research in general, and intervention research in particular, stems from the "lack of documentation of the challenges encountered in implementing interventions designed to change or reform existing practice" (Nastasi & Schensul, 2005, p. 186). Qualitative research can play an important role here. Also, by its very nature, qualitative research allows school psychologists to focus on cultural and contextual factors that enhance or impede the efficacy and social/ecological validity of interventions or programs (Nastasi & Schensul, 2005).

Despite the logical appeal of using qualitative techniques, in the field of school psychology, the use of qualitative research has been extremely scant. For example, Mihalas, Powell, Onwuegbuzie, Suldo, and Daley (in press), who examined 873 articles published in the four major school psychology journals (i.e., *Journal of School Psychology*, *Psychology in the Schools*, *School Psychology Quarterly*, *School Psychology Review*) from 2001 through 2005, found that only six studies published in the 5-year period (i.e., 1.37% of the total number of empirical articles) represented purely qualitative research. Recently, there has been a special issue published containing qualitative research (i.e., Nastasi & Schensul, 2005). Yet, clearly more qualitative research studies are needed in school psychology research.

One reason for the historical dearth of qualitative research investigations in school psychology might stem from the practical roadblocks to using qualitative methods.[1] These practical roadblocks include the fact that

---

[1] In addition to practical roadblocks there are historical and epistemological reasons for the lack of qualitative research in the school psychology field. In particular, psychological research has been dominated by (quantitative) experimental psychology, which has its roots in physiology, physics, and biology, and quantitative psychology, arising from the advances in mathematics, statistics, and psychometrics (Todd et al., 2004).

qualitative research requires expertise in designing and implementing quality studies. Another reason for the scant attention paid to qualitative research techniques by school psychology researchers is that the rationale for doing so has not been made sufficiently explicit. In particular, many school psychology researchers might not be aware of (a) the potential richness of qualitative data and (b) the array of tools available for analyzing qualitative data.

## QUALITATIVE DATA

Qualitative data have many positive features. First and foremost, typically, they provide natural occurring information that allows school psychology researchers to increase their understanding of phenomena. Second, qualitative data tend to be collected in close proximity to the specific situation such as via direct observation or interview, with the influence of the local context being taken into account and not being discarded (Miles & Huberman, 1994). Third, qualitative data often contain some inherent "richness and holism, with strong potential for revealing complexity" (Miles & Huberman, 1994, p. 10), which yield thick, rich descriptions that are contextualized (Onwuegbuzie & Leech, 2004). Fourth, qualitative data often are collected over a long period, allowing for longitudinal analyses of historical, institutional, psychological, and social processes (Nastasi & Schensul, 2005). Fifth, as noted earlier, qualitative data, which often center on people's lived experiences, allow school psychology researchers to study phenomena and strive to make sense of, or interpret, them with respect to the meanings people bring to them (Denzin & Lincoln, 2005b). Finally, qualitative data, by stemming from the particular, facilitate school psychology researchers in studying how "cultural meanings might be exchanged and negotiated as a result of intracultural attempts to find solutions to problems" (Chambers, 2000, p. 856).

Furthermore, qualitative data can be used to strengthen quantitative research designs in general and intervention research designs (i.e., experimental, quasi-experimental) in particular. In fact, building on the conceptualizations of Collins, Onwuegbuzie, and Sutton (2006), four rationales prevail for using qualitative data to improve quantitative research designs: participant enrichment, instrument fidelity, treatment integrity, and significance enhancement. Participant enrichment represents the use of qualitative techniques for the rationale of optimizing the sample (e.g., increasing the number of participants) in a quantitative study. For example, school psychology researchers could conduct a qualitative pilot study to determine the best ways to identify participants for their quantitative study by inter-

viewing potential participants—a concept that Collins et al. (2006, p. 77) coined as "prebriefing"—to obtain qualitative information that establishes their suitability and willingness to participate in the quantitative study.

Instrument fidelity denotes steps taken by researchers to maximize the appropriateness and/or utility of the instruments employed in a quantitative investigation. For instance, a school psychology researcher might conduct a pilot qualitative study to assess the appropriateness and/or utility of existing instruments with the objective of making necessary modifications or developing and improving a new instrument. Alternatively, the researcher could assess instrument fidelity on a continual basis and make modifications, where needed, at one or more phases of the quantitative study.

Treatment integrity represents using qualitative techniques to assess the fidelity of interventions, treatments, or programs. In order for an intervention or program to possess integrity, it should be implemented as intended—that is, it should be implemented in a manner that is consistent with the underlying theory and principles guiding the research design and also reflect the contextual processes that affect program delivery (Gresham, MacMillan, Beebe-Frankenberger, & Bocian, 2000; Onwuegbuzie, 2003). Qualitative assessment of treatment integrity could involve the use of techniques such as interviews, focus groups, observations, and documents. As noted by Collins et al., the use of qualitative techniques for assessing treatment integrity would increase insights into treatment integrity and most likely lead to the identification of implementation bias (i.e., the extent to which implementation of intervention deviated from the protocol; Onwuegbuzie, 2003). The more information that is obtained about the intervention at various stages of the investigation, the better position the school psychology researcher will be in to put quantitative findings in their appropriate context.

Significance enhancement involves the use of qualitative techniques in order to maximize researchers' interpretations of quantitative data. A school psychology researcher can use qualitative data to enhance statistical analyses. Moreover, using quantitative and qualitative data analysis techniques side-by-side typically enhances the interpretation of significant findings in research (Collins et al., 2006; Onwuegbuzie & Leech, 2004, 2006).

Thus, in addition to conducting qualitative studies in their own right, qualitative techniques can be used by school psychology researchers to strengthen the design of quantitative studies. The latter application would yield what is commonly called "mixed methods research" (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2003). As noted by Kratochwill and Stoiber (2000), the "interweaving of quantitative and qualitative research methodologies so that the most accurate and authentic picture of

the knowledge bases and skills associated with change processes is available" (p. 600).

## QUALITATIVE DATA ANALYSIS

One of the most important steps in the research process is analysis of data. Research from the quantitative paradigm has multiple types of analyses, commonly known as statistics. Virtually all graduate students in the social and behavioral sciences, including the field of school psychology, are required to take at least one statistics course as a necessary part of their degree programs (Onwuegbuzie & Wilson, 2003) in which they learn both descriptive and inferential statistical techniques. These statistics courses have helped to sensitize students about the importance of the data analysis process in quantitative studies.

In qualitative research, discussion of analysis clearly is not as common as is the case for quantitative research. In fact, many schools of education offer only one qualitative research course (Leech & Goodwin, 2004), and the one course offered commonly does not include much information about data analysis. With such little focus on analysis, we believe many qualitative researchers believe that there is only one way to analyze qualitative data—through the method of constant comparative or constant comparison analysis (Glaser & Strauss, 1967). For example, recently, in an informal poll of school of education faculty at a large university one question was, "how can qualitative data be analyzed?" More than 80% of the participants responded with "constant comparison analysis" (Leech, 2004). We contend that using a one-size-fits-all approach (i.e., constant comparison analysis) to analyzing qualitative data sometimes will lead to interpretations that are not consistent with the underlying data—thereby affecting legitimation via components such as interpretive validity and theoretical validity (Maxwell, 1992, 2005).

One way this incorrect assumption that constant comparative analysis is the only available qualitative data analysis tool is promoted is through textbooks. There are many texts available to understand the discipline of qualitative research (e.g., Eisner, 1998; Glesne & Peshkin, 1992) and how to write qualitative research reports (e.g., Emerson, Fretz, & Shaw, 1995; Richardson & St. Pierre, 2005; Wolcott, 2001). Yet, the majority of available texts for qualitative research include at most only one chapter, if any, on data analysis (e.g., Berg, 2004; Bogdan & Biklen, 2003; Creswell, 2007; Schram, 2003; Shank, 2002).

In particular, in the latest edition of the *Handbook of Qualitative Research* (Denzin & Lincoln, 2005a), one of the leading textbooks used in

qualitative research courses in the United States, of the 44 chapters contained, only two chapters deal explicitly with qualitative data analysis techniques (i.e., Chapter 32 and 34). Moreover, although well written, these chapters are very conceptual in nature; thus, the authors do not show readers how to conduct the analyses that they discuss. This lack of presentation of applied qualitative data analysis strategies in such a high-profile publication prevails despite the fact that the editors of the book declare the following:

> Qualitative researchers must remain faithful to this indigenous organization and deploy analytic strategies that are fitted to it. We need *rigorous* work that pays systematic attention to the systematic relations among the interaction order, orders of talk, representational orders, and the organized properties of material culture. . ..We need more principled and disciplined ways of accounting for the world and its organization. (pp. 646–647 [emphasis added])

Many other leading qualitative research textbooks (e.g., Lincoln & Guba, 1985) also do not provide explicit details as to how to analyze qualitative data.

One text, Miles and Huberman (1994), does focus on qualitative data analyses. Since then, several more textbooks dealing with qualitative data analyses have been published (Coffey & Atkinson, 1996; Dey, 1993; Phillips & Jorgensen, 2002; Silverman, 2001). However, many of these textbooks focus on one data analysis technique (e.g., discourse analysis; Phillips & Jorgensen, 2002). Thus, these books do not provide a comprehensive treatment of qualitative data analysis techniques; therefore, several textbooks or supplemental information in lectures have to be included by qualitative research instructors in order for their students to be exposed to a repertoire of analytical tools.

As such, we believe many researchers from the field of school psychology and elsewhere do not realize that there are many tools available for analyzing qualitative data. Indeed, Leech and Onwuegbuzie (2005) identified 21 qualitative data analysis techniques. The purpose of this article is to present seven different data analyses techniques, illustrate the use of each technique with the same data set, and demonstrate how utilizing more than one type of analysis can increase understanding of the data. More specifically, we describe the following seven qualitative analysis tools: method of constant comparison, keywords-in-context, word count, classical content analysis, domain analysis, taxonomic analysis, and componential analysis. These techniques were selected because they represent the earliest formalized qualitative data analysis techniques, being conceptualized either in the 1960s (e.g., method of constant comparison; Glaser & Strauss, 1967) or 1970s (e.g., domain analysis, taxonomic analysis, componential analysis; Spradley, 1979), and they represent the most commonly used analysis techniques. We outline when to use each type of analysis. In so doing, we use real qualitative data to help distinguish the various types of analyses. Finally, we discuss the role of computer-assisted software in

the qualitative data-analytic process. Thus, our outline of qualitative data analysis techniques should help to promote rigor in qualitative research.

## DESCRIPTIONS AND EXAMPLES OF A VARIETY OF THE AVAILABLE ANALYSIS TOOLS

As eloquently stated by Hatch (2002):

> Data analysis is a systematic search for meaning. It is a way to process qualitative data so that what has been learned can be communicated to others. Analysis means organizing and interrogating data in ways that allow researchers to see patterns, identify themes, discover relationships, develop explanations, make interpretations, mount critiques, or generate theories. It often involves synthesis, evaluation, interpretation, categorization, hypothesizing, comparison, and pattern finding. It always involves what Wolcott calls "mindwork". . .Researchers always engage their own intellectual capacities to make sense of qualitative data. (pp. 148)

A crucial phrase in the above quotation is "data analysis is a systematic search for meaning." Such a phrase might give school psychology researchers with little or no experience with qualitative data analysis the impression that analyzing qualitative data represents a daunting task. However, there are multiple qualitative data analysis tools available for school psychology researchers that facilitate a systematic search for meaning. In fact, there are many more than could be included in this article. To assist in understanding each type of analysis presented (i.e., method of constant comparison, keywords-in-context, word count, classical content analysis, domain analysis, taxonomic analysis, componential analysis), a brief excerpt of data will be analyzed using each tool. It is important to note that there are many types of data available for qualitative researchers, including interview data, survey data, observational data, personal journals, diaries, permanent records, transcription of meetings, and photographs. This list is only a beginning. All of the types of analyses discussed in this article can be utilized with these types of data. Also, depending on the research question, all of these analyses can be utilized with an array of qualitative research designs, including the following: ethnography, ethnomethodology, case study, participant observation, field research or field study, naturalistic study, phenomenological study, ecological descriptive study, descriptive study, symbolic interactionist study, microethnography, interpretive research, action research, historiography, literary criticism, and grounded theory.

In the following sections, each method is described and an example of its use with real data is presented. The data were collected in a study by Hess, Kozleski, and Molina (2006). The purpose of the study was to investigate parents' perceptions of special education programs in order

to develop a better understanding of inclusion. The data presented were collected through a focus group with parents of children with disabilities.

## Constant Comparison Analysis

Constant comparison analysis likely is the most commonly used type of analysis for qualitative data. Some authors use the term "coding" when referring to this type of analysis (Miles & Huberman, 1994; Ryan & Bernard, 2000). Glaser and Strauss (1967), the fathers of grounded theory, created the method of constant comparison analysis.

When a researcher is interested in utilizing an entire dataset to identify underlying themes presented through the data, a constant comparison analysis can be helpful. Constant comparison can be undertaken deductively (e.g., codes are identified prior to analysis and then looked for in the data), inductively (e.g., codes emerge from the data), or abductively (i.e., codes emerge iteratively).

To perform a constant comparison analysis, the researcher first reads through the entire set of data (this also could be a subset of the data). After doing so, the researcher chunks the data into smaller meaningful parts. Then, the researcher labels each chunk with a descriptive title or a "code." The researcher takes pains to compare each new chunk of data with previous codes, so similar chunks will be labeled with the same code. After all the data have been coded, the codes are grouped by similarity, and a theme is identified and documented based on each grouping.

Constant comparative analysis can be used throughout a research study. One way of using the codes is to go back out into the field and undertake member checking (Merriam, 1998) with the participants by asking if the themes, arguments, or assertions developed from the codes are accurately describing their statements (Janesick, 2000; Merriam, 1998), leading to descriptive validity (Maxwell, 1992, 1995). Also, it is helpful for participants to read the definition and explanation of the themes generated from the data in order to assess the accuracy.

Constant comparison analysis originally was developed to analyze data that were collected over a series of rounds. In particular, these rounds of data analyses led to theoretical sampling, which involves the sampling of additional people, groups, events, incidents, activities, documents, and the like, in order to develop emergent themes, to assess the adequacy, relevance, and meaningfulness of themes, to refine ideas, and to identify conceptual boundaries (Charmaz, 2000). However, constant comparison analysis since has been modified to be used to analyze data collected in one round (e.g., single round of interviews).

*An Example of a Constant Comparison Analysis*

Below is a brief excerpt of data and how one researcher analyzed it using constant comparison analysis. The research question was, "What is the parent's perception of the IEP meeting?"

In order to perform the constant comparison analysis, first, the researcher reads through the data. Next, the researcher underlines chunks, or phrases of the data (we have underlined the chunks in this excerpt). In Table 1, each chunk is assigned a code. Before a code is applied, the earlier codes are checked to see if there is an existing similar code (this is the comparison part of the analysis).

> It was really difficult for me to sit through IEP meetings and different people would start talking speech jibberish, different people would say things, and I would sit there and I would really try to focus on what's going on. But I would take that paper home, and I'd look at it and I'd be thinking, what in the world just happened? It took me pretty, several years, before I realized, I am his advocate. I have to speak up and say, okay, wait a minute, slow down, what does that mean, what did you say?

Next, the codes are combined and themes developed. For these data, the themes might be "Complicated IEP Papers" and "Child Advocate."

**Table 1.** Emergent Codes From Constant Comparison Analysis

| Chunks | Code for each chunk |
| --- | --- |
| Really difficult for me to sit through IEP meetings | Difficult to sit |
| Different people | Different people |
| Start talking speech jibberish | Talk jibberish |
| Different people would say things | Different people |
| I would sit there | Difficult to sit |
| I would really try to focus on what's going on | Try to focus |
| I would take that paper home | Paper |
| I'd look at it and I'd be thinking | Paper |
| What in the world just happened | What happened? |
| Took me pretty, several years | Took years |
| I am his advocate | Advocate |
| I have to speak up | Advocate |
| Say, okay, wait a minute, slow down, what does that mean, what did you say | Advocate |

## Keywords-in-Context

Keywords-in-context (KWIC; Fielding & Lee, 1998) is a data analysis method that reveals how respondents use words in context by comparing words that appear before and after "key words." This type of analysis identifies how one uses the word(s) in context, which some qualitative researchers refer to as an analysis of the culture of the use of the word (Fielding & Lee). KWIC is a helpful analysis to utilize when there are

specific words that are of interest to the researcher or when the data appear to be less rich in information. Many times, with data that seem uninteresting, KWIC can help identify underlying connections that the participant was implying through her/his speech. A weakness of KWIC is losing sight of the context of the words. If the words collected around the keyword are insufficient, the phrase can lose its meaning.

To perform a keywords-in-context analysis, the researcher reads through the data and identifies keywords, namely, words that are used either frequently or in an unusual manner. Then, the researcher lists the words that come before and after the keyword. At times, there can be difficulty in deciding what keyword to use in a KWIC analysis. Keywords should be chosen through previous research or theory (i.e., a priori), or through frequency of use throughout a data set (i.e., a posteriori). Like constant comparative analysis, keywords-in-context can be used throughout a research study.

### *An Example of a Keywords-in-Context Analysis*

Utilizing the same data as above, a keywords-in-context analysis is presented below. The research question was, "What stands out for the parent in IEP meetings?"

> It was really difficult for me to sit through IEP meetings and <u>different</u> people would start talking speech jibberish, <u>different</u> people would say things, and I would sit there and I would really try to focus on what's going on. But I would take that paper home, and I'd look at it and I'd be thinking, what in the world just happened? It took me pretty, several years, before I realized, I am his advocate. I have to speak up and say, okay, wait a minute, slow down, what does that mean, what did you say?

From this small amount of data, the researcher found "different" to be a keyword. The researcher read through the data, underlined the word "different" and then transferred this information to Table 2. This table includes the actual keyword, its context, and its interpretations. The overall description from this might be "In IEP meetings, different people talk, making understanding difficult."

**Table 2.** Analysis With Keywords-in-Context

| Keyword-in-context | Interpretation |
| --- | --- |
| IEP meetings and different people would start talking speech jibberish | Different people talking jibberish |
| Different people would say things | Different people talking |

## Word Count

Word counts are based on the belief that all people have distinctive vocabulary and word usage patterns. These patterns become what are often called "linguistic fingerprints" (Pennebaker, Mehl, & Niederhoffer, 2003, p. 568). One way to understand the perspective of the person is to count the words used. The underlying assumption with word counts is that more important and significant words for the person will be used more often (Carley, 1993). Thus, one method of using this form of analysis is to count the number of times a specific word is used. Usually, word counts are used when the entire data set has been collected, but it can also be used throughout the research process.

According to Sechrest and Sidani (1995, p. 79), "qualitative researchers regularly use terms such as 'many,' 'most,' 'frequently,' 'several,' 'never,' and so on. These terms are fundamentally quantitative." Thus, qualitative researchers can obtain more meaning by obtaining counts of words in addition to their narrative descriptions (Sandelowski, 2001). As noted by Miles and Huberman (1994), there are at least three reasons for counting themes: (a) to identify patterns more easily, (b) to verify a hypothesis, and (c) to maintain analytic integrity. Further, by counting words, school psychology researchers are able to leave an audit trail, which are recommended by many qualitative researchers as a method of evaluating legitimation or increasing legitimation, or both (Halpern, 1983; Lincoln & Guba, 1985; Onwuegbuzie & Leech, 2007b). As such, counting can help to improve the rigor of an analysis. Counting words also can enhance *verhesten* by preventing the researcher from overweighting or underweighting the emergent themes (Sandelowski, 2001).

There are weaknesses to word count. One drawback is that word count can decontextualize the word to a point where it is not understandable. For example, the word "I" does not increase the researcher's understanding of IEP meetings without the context around the word. Another weakness is that word count can be misleading: participants do not need to use a word frequently to portray important concepts.

Word count is especially useful with focus groups; it can help identify participants who spoke the most and who spoke the least. If a researcher counts the use of all the words and finds the most frequently used words, these words can be helpful in understanding what is important to the participant. Furthermore, these words can be utilized in KWIC analysis.

## *An Example of Word Count*

The above data excerpt used to illustrate KWIC was typed into Microsoft Word, and the word count command was utilized to find that there are 96 words. Utilizing word count to understand the importance of a single word, the researcher could count the number of times the word "difficult" is used. The researcher utilized the research question, "How frequently does the parent use the word 'difficult' in a given passage?" and "Are there other frequently used words that would help in understanding the parent's perceptions?" In this example, the word "difficult" is used on two occasions, which represents a usage rate of approximately 2%. The word "I" was used on five occasions, representing 5% usage rate, and the word "say" was used on two occasions, representing a 2% usage rate. However, it could be argued that of these three words (i.e., "difficult," "I," "say"), only the word "difficult" adds significant meaning.

## Classical Content Analysis

Classical content analysis is similar to constant comparison analysis and also is used frequently in qualitative research; the main difference is that instead of creating themes, the researcher counts the number of times each code is utilized.[2] This type of analysis is helpful to use when there are many codes; it can identify which codes are used most and which might be the most important concepts for the interviewee. Typically, the codes are produced deductively and then can be either included as descriptive information about the data, can be analyzed using quantitative procedures (Kelle, 1996), or both (Onwuegbuzie & Teddlie, 2003). Classical content analysis can be used throughout the research process.

## *An Example of Classical Content Analysis*

The data excerpt used for the previous analyses was analyzed using classical content analysis. The codes created from constant comparison analysis were utilized (cf. Table 1). The researcher wanted to answer the research question, "What concepts (represented through codes) are discussed most?" As can be seen from Table 3, it is seen that "advocate" was

---

[2] Classical content analysis is not the only type of content analysis. Other types of content analyses include latent content analysis and manifest content analysis. For a discussion of these forms of content analyses, see Leech and Onwuegbuzie (2005).

**Table 3.** Results From a Classical Content Analysis

| Code | Number of times used |
| --- | --- |
| Difficult to sit | 2 |
| Different people | 2 |
| Talk jibberish | 1 |
| Try to focus | 1 |
| Paper | 2 |
| What happened? | 1 |
| Took years | 1 |
| Advocate | 3 |

used most (3 times), then followed by "difficult to sit," "different people," and "paper" (each code used 2 times), and all the other codes were used only once.

## Domain Analysis

Domain analysis represents a search for the larger units of cultural knowledge, which Spradley (1979) called domains. This method of analysis stems from the belief that symbols are an important way of communicating cultural meaning. The definition of a symbol is "an act, sound, or object having cultural significance and the capacity to excite or objectify a response" (Merriam Webster, 2005, ¶ 1). According to Spradley (1979), all symbols have three elements: (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).

Domain analysis utilizes semantic relationships to help uncover domains. 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). Casagrande and Hale (1967) identified 13 types of semantic relationships. Building on Casagrande and Hale's (1967) conceptualization, Spradley (1979) proposed nine semantic relationships as being the most useful for conducting an analysis of semantic domains. Casagrande and Hale's (1967) and Spradley's (1979) types and the relationships of X and Y are listed in Table 4 and Table 5, respectively. These relationships are the foundation of domain analysis.

As with constant comparison analysis wherein the researcher is labeling chunks of data with codes, in domain analysis the researcher is labeling the domains. As conceptualized by Spradley (1979), domain analysis involves a six-step process: (1) select a single semantic relationship (repeated), (2) prepare a domain analysis worksheet (repeated), (3) select a

**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 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 |

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); and (6) make a list of all hypothesized domains. Because the result of domain analysis is to create further structural questions for the participant, this tool for analysis is best used during the data gathering phase.

Some researchers believe that domain analysis should be reserved for pure ethnographic studies, as was suggested by the founder of domain analysis (Spradley, 1979). However, we believe the beneficial aspect of domain analysis is that it gives an alternative lens with which to understand data, and it helps in creating future questions for participants. Domain analysis should be used when researchers are interested in understanding relationships among concepts.

**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 result/cause of Y |
| Location for action | X is a place for doing Y |
| Function | X is a place for doing 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 |

Note. From the Ethnographic Interview 1st edition by Spradley (1979). Reprinted with permission of Wadsworth, a division of Thomas Learning: www.thomsonrights.ccm. Fax: 800–730–2215.

*An Example of Domain Analysis*

Below is the data excerpt analyzed with domain analysis. The research question was "What characteristics of IEP meetings are presented?"

> It was really difficult for me to sit through IEP meetings and different people would start talking speech jibberish, different people would say things, and I would sit there and I would really try to focus on what's going on. But I would take that paper home, and I'd look at it and I'd be thinking, what in the world just happened? It took me pretty, several years, before I realized, I am his advocate. I have to speak up and say, okay, wait a minute, slow down, what does that mean, what did you say?

Using domain analysis the following terms and relationship were identified:

(a) Possible cover term—IEP meeting

(b) Possible included terms— difficult, different people, speech jibberish

(c) Possible semantic relationships—X is an attribute (characteristic) of Y

For the semantic relationship above, "X" is the included term (e.g., difficult) and "Y" is the cover term of an IEP meeting. From these terms and relationships, the researcher can construct questions—for example, "How are IEP meetings difficult?" or "What would make the speech jibberish more understandable?"

## Taxonomic Analysis

Taxonomic analysis is the second step after domain analysis. Domain analysis can be undertaken alone, or it can be utilized further with taxonomic analysis. Taxonomic analysis helps the researcher to understand how participants are using specific words. School psychology researchers should not assume that words participants use have the same meaning and implications. Once the domains have been identified, in taxonomic analysis, one domain is chosen and is placed into a taxonomy. A taxonomy is defined by Spradley (1979) as a "classification system" that inventories the domains into a flowchart or diagram to help the researcher understand the relationships among the domains. Similar to a domain analysis, a taxonomic analysis is a set of categories organized on the basis of a single semantic relationship. However, a taxonomic analysis differs from a domain analysis inasmuch as a taxonomy shows the relationships among all the terms in a domain. More specifically, a taxonomic analysis reveals subsets of terms and the way these subsets are related to the domain as a whole (Spradley). According to Spradley, a taxonomic analysis involves the fol-
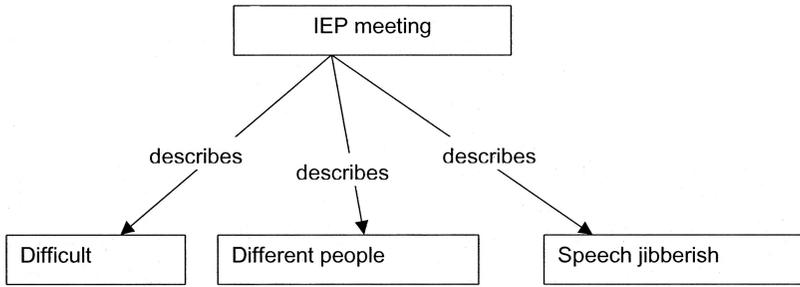
**Figure 1.** A taxonomic representation of the data.

lowing eight steps: (1) select a domain for taxonomic analysis; (2) identify the appropriate substitution frame for analysis (a substitution frame [e.g., "is a kind 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 you are analyzing; (5) construct a tentative taxonomy; (6) formulate structural questions to verify taxonomic relationships; (7) conduct additional structural interviews; and (8) construct a completed taxonomy.

### An Example of Taxonomic Analysis

Using the domain analysis results from above, the following taxonomic analysis was completed. The research question was "How are IEP meetings described?" Thus, the substitution frame identified by the researcher is presented in Figure 1 and was "describes."

Figure 1 shows the following substitutions:

Difficult describes IEP meetings

Different people describes IEP meetings

Speech jibberish describes IEP meetings

From these substitutions, the researcher can create structural questions to ask the participants, "What are other ways of describing an IEP meeting?" and "How many different people are involved?" After these questions are answered, the researcher can refine the taxonomy and use it in the write up to help the reader understand the data.

**Table 6.** Componential Analysis Table

| | Dimensions of contrast | | |
| --- | --- | --- | --- |
| Contrast set | Does it help the parent feel the needs of the child will be met? | Does it help the parent understand the process? | Does it help the parent participate in the meeting? |
| Difficult | No | No | No |
| Different people | Maybe | Maybe | No |
| Speech jibberish | Maybe | No | No |

## Componential Analysis

Componential analysis is another step that can be undertaken after domains are created. Componential analysis is a "systematic search for attributes (components of meaning) associated with cultural symbols" (Spradley, 1979, p. 174). Componential analysis is used when a researcher is trying to uncover relationships between words. This analysis is used to discover the differences between the subcomponents of domains, with the goal being to "map as accurately as possible the psychological reality of our informant's cultural knowledge" (p. 176), or in other words, to find and present the differences. Matrices and/or tables (cf. Table 6) are useful in performing a componential analysis. Usually these have at least two dimensions (a) "the contrast set" and (b) "dimensions of contrast." The dimensions of contrast are questions formulated by the researcher to help differentiate the contrast set. Each question needs to be answered either "yes" or "no." According to Spradley , 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, and (8) prepare a completed paradigm.

### An Example of Componential Analysis

As shown in Table 6, the included terms identified through domain analysis were utilized as the contrast set. The dimensions of contrast were formulated through information gathered from the participant and reflection of the researcher. The research question was "How are IEP meetings helpful for parents?"

As shown in Table 6 the aspect "different people" is unlike the other aspects in that it might help the parent understand the process more and

feel more involved. The term "difficult" did not fit with any of the dimensions of contrasts, which indicates that the researcher should consider other dimensions. From this analysis, the researcher would create structural questions to fill in gaps in understanding the contrast set. One question might be "How can IEP meetings be more helpful?"

## CHOOSING AMONG THE SEVEN QUALITATIVE DATA ANALYSIS TOOLS

The previous sections have outlined seven powerful procedures for analyzing qualitative data. In order to help school psychology researchers to select the most appropriate procedures, we will compare and contrast each of these techniques. Increasing rigor and trustworthiness of the findings from qualitative data is accomplished through three different procedures: (a) using more than one type of analysis, (b) assessing interrater reliability, and (c) member checking. As we have stated, using more than one type of analysis can strengthen the rigor and trustworthiness of the findings via methodological triangulation (i.e., consistency among qualitative analytic procedures; Denzin, 1978). Furthermore, having multiple researchers code the data and then assessing interrater reliability can strengthen the trustworthiness of the findings via investigator triangulation (i.e., consistency among researchers; Denzin, 1978).[3] To evaluate interrater reliability, the researcher can begin by rating how close the themes are between two raters. For example, the following scale can be used: 0 (*no agreement*), 1 (*a little agreement*), 2 (*much agreement*), 3 (*total agreement*). Then, the researcher would compute Kappa (Cohen, 1960) or another appropriate statistic to calculate the overall agreement between the two raters for all of the themes. For three or more raters, the multirater Kappa measure can be used (Siegel & Castellan, 1988). Some qualitative software will allow the computation of interrater reliability—for example N6 (QSR International Pty Ltd, 2006). Finally, member checking, which involves the researcher showing the findings and/or interpretations to the participants for assessment of accuracy, can increase the rigor and trustworthiness of the findings via what we term as descriptive triangulation (i.e., consistency between researcher and participant[s]). Member checking can be under-

---

[3] It should be noted that some qualitative researchers strongly disagree on philosophical grounds with the practice of using a statistics to assess interrater reliability. Rather, they believe that discussion among analysts represents the best method to determine agreement. These researchers argue that having the perspectives of multiple analysts does not necessarily increase the accuracy of interpretation. Further, they contend that an analyst with a different perspective may have the greatest insightful of all.

taken with all of seven analyses and should be used to enhance descriptive validity, interpretive validity, and/or theoretical validity (Maxwell, 1992, 2005).

Constant comparison analysis is a method of choice when the researcher wants to answer general, or overarching, questions of the data. For example, if a researcher wants to understand a school psychologist's perceptions of work, using constant comparison analysis would be appropriate. Word count is particularly useful if the researcher can assume that frequency of words, categories, or themes provides a good indication of meaningfulness. If this assumption cannot be made, then the school psychology researcher should consider using one of the other data analysis tools. KWIC is an appropriate tool to use when the researcher is interested in capturing the actual words used by the participant (i.e., in vivo codes). This is particularly useful when analyzing short responses to unstructured or structured questions. However, this analysis still can be utilized to analyze large unstructured text. Similarly, classical content analysis is useful when codes have been generated and a sense of how often each code has been used would be helpful. Generally, this is most useful when the researcher is interested in the frequency of the themes.

Domain analysis is helpful to use when the researcher has the option of interviewing the same participant again. With domain analysis, structural questions are generated that can help identify what aspects of the participant's story the researcher needs further information. Taxonomic analysis, like domain analysis, is helpful to increase understanding of participants' speech or language. It is best used after domain analysis has been completed, and further analysis would assist the researcher in organizing the included terms used by the participant(s). Finally, componential analysis is commonly used after domain and taxonomic analysis. This analysis is useful for seeing comparisons in the data and identifying places where the researcher needs further clarification from the participant(s).

All seven data analysis tools are similar in that they involve the three concurrent flows of activity: data reduction, data display, and conclusion drawing verification (Miles & Huberman, 1994). However, some of these techniques (e.g., domain analysis) also can lead to data expansion by leading to additional questions being posed and addressed. Table 7 links general research question formats with suggested analyses. It should be noted that any type of analysis can be undertaken, regardless of the research questions; thus, these are only suggestions.

**Table 7.** Types of Research Questions (Adapted From Miles and Huberman, 1994)

| | Dimensions of contrast | | | | | | |
| | Data analysis techniques | | | | | | |
| General research question format | CCA | WC | KWIC | CC | DA | TA | CA |
|---|---|---|---|---|---|---|---|
| Does X cause Y? | | | | | X | X | |
| Does X cause more of Y than Z causes of Y? | X | | | X | | | X |
| What is X? | X | X | X | X | X | X | X |
| Is X located where Y is lowest? | | | X | | X | X | X |
| What does "Y" mean? | | | X | X | X | X | |
| Why does S support X? | | X | X | X | X | X | X |
| What makes W good? | X | | X | X | X | X | X |
| Does T value X? | X | | | X | X | X | X |
| Is X more cost-effective than Z? | X | X | X | | | | X |
| How are U maximized and V minimized simultaneously? | | | | X | | | X |

*Note.* CCA = Classical Content Analysis; WC = Word Count; KWIC = Keywords in Context; CC = Constant Comparison; DA = Domain Analysis; TA = Taxonomic Analysis; CA = Componential Analysis.

## USING COMPUTER-ASSISTED QUALITATIVE DATA ANALYSIS SOFTWARE

Computer-assisted data qualitative data analysis software (CAQDAS) programs (e.g., NVIVO, version 7.0; QSR International Pty Ltd., 2006) are available that can be used to undertake each of the qualitative data analyses outlined above. Unfortunately, it is beyond of the present article to provide specifics as to how computer qualitative data analysis software can be utilized. We recommend that, when possible, school psychology researchers take workshops that provide training in using computer qualitative data analysis software.[4]

For more than a decade, computer software for qualitative data has increased in availability and in complexity (Ulin, Robinson, & Tolley, 2005). Unfortunately, as noted by Bourdon (2002, ¶ 1), "their use is still relatively limited compared with their full potential. The proportion of research projects relying on them appears to be steadily increasing but very few researchers are known to fully exploit their capabilities." Yet, using computer-assisted data qualitative data analysis software (CAQDAS) al-

---

[4] The University of Surrey's CAQDAS Networking Project maintains a website with links to many software developers and workshops at http://www.soc.surrey.ac.uk/caqdas/. This organization has no commercial links to any software developer or supplier. For information about the full range of qualitative software available, and the tools that different software packages provide, we advise you to go directly to the software developers' Web sites. Also, for an excellent comparison of the leading qualitative software (i.e., ATLAS.ti V5, HyperRESEARCH V.2.06, MAXqda V2, N6, NVivo 2, QDAMiner, Qualrus, Transana), see Lewins and Silver (2005).

lows the researcher to take analysis of qualitative data significantly further than is possible undertaking this analysis by hand (Bazeley 2006, Fielding & Lee, 1998; Kelle, 1996; Tesch, 1990; Weitzman & Miles, 1995). In particular, CAQDAS programs provide an excellent tool for recording, storing, indexing, and sorting the voluminous data that are the hallmark of many qualitative research studies (Morse & Richards, 2002). CAQDAS programs are extremely useful for allowing the researcher to code data—which involves disaggregating data by breaking data down into manageable components and identifying or naming these segments (i.e., assigning it to a category). The text material also can be coded easily into new emergent concepts, categories, or themes. Further, text stored in these new coding categories can be compared (i.e., cross-referenced) as a function of individual- or group-based demographic information (i.e., attributes) or with respect to responses to other coded questions (Bazeley, 2006).

Many CAQDAS programs (e.g., NVIVO) can find individual words and search patterns of words, coding, or attributes. These search results then can be saved, allowing the researcher to build more questions on them (Morse & Richards, 2002), as is often undertaken in domain analysis, taxonomic analysis, and componential analysis. All CAQDAS programs allow the conduct of word count and KWIC by providing various types of counts such as the number of cases with a particular coding, the number of text segments coded at a specific category, and the total number and/or proportion of characters or words coded, while retaining the text underlying the numeric information in order to provide situated meaning (Bazeley, 2006). Another advantage of CAQDAS programs is that because they (can) record all the major analytic decisions made by the researcher, an audit trail can be left. As noted by Dey (1993), "the ability to interrogate data and revise conceptualizations through searching and retrieving categorized data promises to introduce a new flexibility and rigour into qualitative analysis" (p. 59).

At this point, a caution is needed about using software: CAQDAS programs can help researchers to analyze their data, but they cannot analyze the data for researchers. Further, in using CAQDAS programs, flexibility, creativity, insight, and intuition should never be replaced by a systematic and mechanical analysis of qualitative data (Dey, 1993). The researcher is the main tool for analysis, regardless of whether a computer program is used to assist in the analysis (Denzin & Lincoln, 2005b). For large data sets, there is no comparison available for computer programs when it comes to data management.

## WHERE TO GO FROM HERE

As noted by Miles and Huberman (1994), "The strengths of qualitative data rest on the competence with which their analysis is carried out" (p. 10). We believe that an important step for school psychology researchers to be competent analysts of qualitative data is awareness of multiple ways of analyzing qualitative data. Thus, the purpose of this article was to provide elements to increase understanding of the multiple types of analyses available for school psychology researchers. Most researchers use one type of analysis and hope the results are trustworthy. The data analysis of the example data analyzed throughout this paper exemplifies the need for researchers to use more than one data analysis method. For example, if the researcher had utilized word count alone, and focused on "different," the issue of advocating would not have emerged. Likewise, if the researcher stops with only one domain, as shown in the text, the concept of taking years to understand would not emerge.

Thus, we contend that researchers need to utilize at least two, if not more, types of data analysis tools in order to triangulate results. Lincoln and Guba (1985) discuss the importance of triangulation, which is a means of improving the rigor of the analysis by assessing the integrity of the inferences that one draws from more than one vantage point. Typically, triangulation involves the use of multiple data sources, multiple researchers, multiple theoretical perspectives, and/or multiple methods (Denzin, 1989; Schwandt, 2001). In particular, triangulation is viewed as involving the use of multiple data collection tools (Denzin, 1989; Oliver-Hoyo & Allen, 2006; Tuckett, 2005). However, we believe that the concept of triangulation also should be extended to data analysis tools. In fact, building on the conceptualizations of Onwuegbuzie and Teddlie (2003) and Greene, Caracelli, and Graham (1989), we contend that there are two major rationales for using multiple data analyses tools in qualitative research, namely: representation and legitimation. These two rationales and their components are represented in Figure 2.

Representation refers to the ability to extract adequate meaning from the underlying data. Using multiple qualitative data analyses allows the researcher to utilize the strengths of each qualitative data analysis tool involved in order to understand better the phenomenon. The ability to "get more out of the data" by using multiple analytical tools provides the school psychology researcher the opportunity to generate more meaning, thereby enhancing the quality of inferences. As can be seen from Figure 2, there are four major ways in which representation can be enhanced by using multiple qualitative data analysis techniques: within-method complementary (i.e., seeking elaboration, enhancement, illustration, clarification of the results

from one analytical tool with results from another tool); within-method triangulation (i.e., seeking convergence and corroboration of results from different analytical methods used on the same data); within-method expansion (i.e., seeking to expand the breadth and range of inferences by using different analytical tools for different data components); and within-method development (i.e., using the results from one analytical approach to help inform results from another analytical approach). As such, using multiple qualitative data analysis tools can help researchers to address what Denzin and Lincoln (2005b) refer to as the crisis of representation, namely, the difficulty in capturing lived experiences via text.

Legitimation refers to the trustworthiness, credibility, dependability, confirmability, and/or transferability of the inferences made (Guba, 1981; Onwuegbuzie & Leech, 2007b). As noted 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). As can be seen
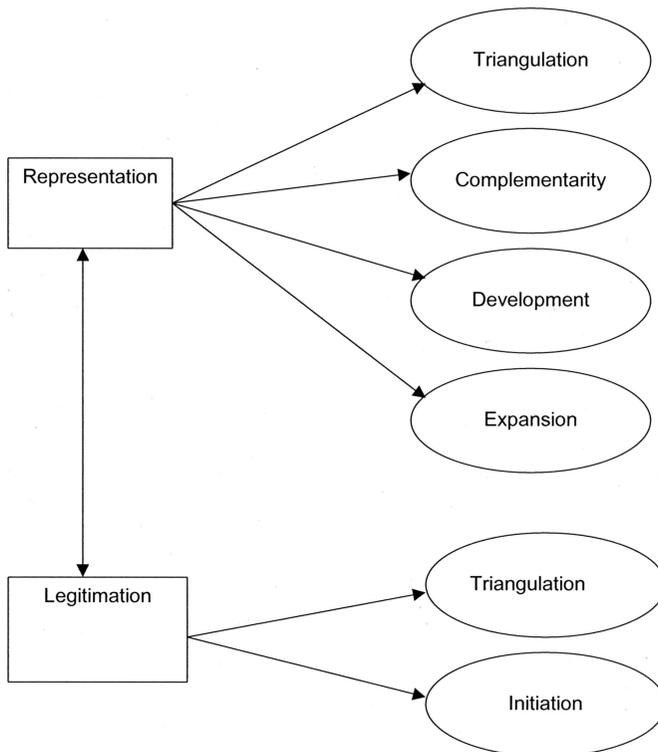
Figure 2. Typology of reasons for using multiple qualitative data analysis tools.

from Figure 1, there are two major ways in which legitimation can be enhanced by using multiple qualitative data analysis techniques: within-method initiation (i.e., discovering paradoxes and contradictions that lead to a reframing of the research question) and within-method triangulation. As such, using multiple qualitative data analysis tools can help researchers to address what Denzin and Lincoln (2005b) refer to as the crisis of legitimation, namely, the difficulty in assessing qualitative findings.

As has been illustrated in this article, by using multiple types of analyses, the qualitative data analysis process will become more rigorous. Thus, researchers need to pay attention to the array of available qualitative analyses tools, learn about the tools, and use them diligently. By doing so, qualitative research will become appealing to researchers from the field of school psychology and beyond.

## REFERENCES

Adler, L. (1996). Qualitative research of legal issues. In D. Schimmel (Ed.), *Research that makes a difference: Complementary methods for examining legal issues in education,* NOLPE Monograph Series (No. 56, pp. 3–31). Topeka, KS: NOLPE.

Banister, P. Burman, E. Parker, I., Taylor, M., & Tindal, C. (1994). *Qualitative methods in psychology: A research guide.* Buckingham: Open University Press.

Bazeley, P. (2006). The contribution of computer software to integrating qualitative and quantitative data and analyses. *Research in the Schools, 13*(1), 64–74.

Berg, B. L. (2004). *Qualitative research methods for the social sciences* (5th ed.). Boston: Pearson.

Bogdan, R. C., & Biklen, S. K. (2003). *Qualitative research for education: An introduction to theories and methods* (4th ed.). Boston: Pearson.

Bourdon, S. (2002, May). The integration of qualitative data analysis software in research strategies: Resistances and possibilities. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* [On-line Journal], 3(2). Retrieved March 11, 2006, from http://www.qualitative-research.net/fqs-texte/2–02/2–02bourdon-e.htm

Carley, K. (1993). Coding choices for textual analysis: A comparison of content analysis and map analysis. In P. Marsden (Ed.), *Sociological methodology* (pp. 75–126). Oxford: Blackwell.

Casagrande, J. B., & Hale, K. L. (1967). Semantic relationships in Papago folk-definitions. In D. Hymes & W. E. Bittle (Eds.), *Studies in Southwestern ethnolinguistics* (pp. 165–196). The Hague: Mouton.

Chambers, E. (2000). Applied ethnography. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 851–869). Thousand Oaks, CA: Sage.

Charmaz, K. (2000). Grounded theory: Objectivist and constructivist methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 509–535). Thousand Oaks, CA: Sage.

Coffey, A., & Atkinson, P. (1996). *Making sense of qualitative data: Complementary research strategies.* Thousand Oaks, CA: Sage.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement, 20,* 37–46.

Collins, K. M. T., Onwuegbuzie, A. J., & Sutton, I. L. (2006). A model incorporating the rationale and purpose for conducting mixed methods research in special education and beyond. *Learning Disabilities: A Contemporary Journal, 4,* 67–100.

Connolly, P. (1998). 'Dancing to the wrong tune': Ethnography generalization and research on

racism in schools. In P. Connolly & B. Troyna (Eds.), *Researching racism in education: Politics, theory, and practice* (pp. 122–139). Buckingham, UK: Open University Press.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among the five approaches.* (2nd ed.) Thousand Oaks, CA: Sage.

Denzin, N. K. (1978). *The research act: A theoretical introduction to sociological methods.* New York: Praeger.

Denzin, N. K. (1989). The r*esearch act: Theoretical introduction to sociological methods* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2005a). *The Sage handbook of qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.

Denzin, N. K., & Lincoln, Y. S. (2005b). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 1–32). Thousand Oaks, CA: Sage.

Dey, I. (1993). *Qualitative data analysis: A user-friendly guide for social scientists.* London: Routledge.

Eisner, E. W. (1998). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice.* Upper Saddle River, NJ: Merrill Prentice Hall.

Emerson, R. M., Fretz, R. I., & Shaw, L. L. (1995). *Writing ethnographic fieldnotes.* Chicago: The University of Chicago Press.

Fielding, N. G., & Lee, R. M. (1998). *Computer analysis and qualitative research.* Thousand Oaks, CA: Sage.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Chicago: Aldine.

Glesne, C., & Peshkin, A. (1992). *Becoming qualitative researchers: An introduction.* White Plains, NY: Longman.

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis, 11,* 255–274.

Gresham, F. M., MacMillan, D. L., Beebe-Frankenberger, M. E., & Bocian, K. M. (2000). Treatment integrity in learning disabilities research: Do we really know how treatments are implemented? *Learning Disabilities Research & Practice, 15,* 198–205.

Guba, E. G. (1981). ERIC/ECTJ annual review paper: Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Communication and Technology: A Journal of Theory, Research, and Development, 29,* 75–91.

Halpern, E. S. (1983). *Auditing naturalistic inquiries: The development and application of a model.* Unpublished doctoral dissertation, Indiana University, Bloomington.

Hatch, J. A. (2002). *Doing qualitative research in education settings.* Albany: SUNY Press.

Hess, R., Molina, A., & Kozleski, E. B. (2006). Until somebody hears me: Parental voice and advocacy in special education decision-making. *British Journal of Special Education, 33,* 148–157.

Janesick, V. J. (2000). The choreography of qualitative research design: Minuets, improvisations, and crystallization. In N. K. Denzin & Y. S. Lincoln, (Eds.) *Handbook of qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33,* 14–26.

Kelle, U. (Ed.) (1996). *Computer-aided qualitative data analysis.* Thousand Oaks, CA: Sage.

Kratochwill, T. R., & Stoiber, K. C. (2000). Uncovering critical research agendas for school psychology. *School Psychology Review, 29,* 591–603.

Leech, N. L. (2004). *Types of qualitative and quantitative analyses used by faculty researchers.* Unpublished manuscript, University of Colorado at Denver and Health Sciences Center.

Leech, N. L., & Goodwin, L. (2004). *Research courses in Ph.D. programs across the United States: Accountability and trends.* Unpublished manuscript, University of Colorado at Denver and Health Sciences Center.

Leech, N. L., & Onwuegbuzie, A. J. (2005, April). *Qualitative data analysis: Ways to improve accountability in qualitative research.* Paper presented at the annual meeting of the American Educational Research Association, Montreal, Canada.

Lewins, A., & Silver, C. (2005). *Choosing a CAQDAS package: A working paper.* Retrieved

March 11, 2006, from http://caqdas.soc.surrey.ac.uk/ChoosingLewins&SilverV3Nov05.pdf

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Beverly Hills, CA: Sage.

Maxwell, J. A. (1992). Understanding and validity in qualitative research. *Harvard Educational Review, 62,* 279–299.

Maxwell, J. A. (2005). *Qualitative research design: An interactive approach* (2nd ed.). Newbury Park, CA: Sage.

Merriam, S. B. (1998). *Qualitative research and case study applications in education* (2nd ed.). San Francisco: Jossey-Bass.

Merriam-Webster. (2005). *Merriam-Webster Online Dictionary.* Retrieved January 25, 2005 from http://www.mw.com/cgibin/dictionary?book=Dictionary&va=symbol&x=10&y=7

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.

Morse, J. M., & Richards, L. (2002). *Read me first for a user's guide to qualitative methods.* Thousand Oaks, Sage.

Nastasi, B. K., & Schensul, S. L. (Eds.) (2005). Contributions of qualitative research to the validity of intervention research. Special issue of *Journal of School Psychology, 43,* 177–195.

Oliver-Hoyo, M., & Allen, D. (2006). The use of triangulation methods in qualitative educational research. *Journal of College Science Teaching, 35,* 42–47.

Onwuegbuzie, A. J. (2003). Expanding the framework of internal and external validity in quantitative research. *Research in the Schools, 10,* 71–90.

Onwuegbuzie, A. J., & Leech, N. L. (2004). Enhancing the interpretation of "significant" findings: The role of mixed methods research. *The Qualitative Report, 9,* 770–792. Retrieved March 8, 2005, from http://www.nova.edu/ssss/QR/QR9–4/ onwuegbuzie.pdf

Onwuegbuzie, A. J., & Leech, N. L. (2006). Linking research questions to mixed methods data analysis procedures. *The Qualitative Report, 11,* 474–498. Retrieved June 6, 2007, from http://www.nova.edu/sss/QR/QR11-3/onwuegbuzie.pdf

Onwuegbuzie, A. J., & Leech, N. L. (2007a) A call for qualitative power analyses. *Quality & Quantity: International Journal of Methodology, 41*, 105–121.

Onwuegbuzie, A. J., & Leech, N. L. (2007b). Validity and qualitative research: An oxymoron? *Quality & Quantity: International Journal of Methodology, 41*, 233–249.

Onwuegbuzie, A. J., & Teddlie, C. (2003). A framework for analyzing data in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 351–383). Thousand Oaks, CA: Sage.

Onwuegbuzie, A. J., & Wilson, V. A. (2003). Statistics anxiety: Nature, etiology, antecedents, effects, and treatments: A comprehensive review of the literature. *Teaching in Higher Education, 8,* 195–209.

Pennebaker, J. W., Mehl, M. R., & Niederhoffer (2003). Psychological aspects of natural language use: Our words, our selves. *Annual Review of Psychology, 54,* 547–577.

Phillips, L. J., & Jorgensen, M. W. (2002): *Discourse analysis as theory and method.* Thousand Oaks, CA: Sage.

Powell, H., Mihalas, S., Onwuegbuzie, A. J., Suldo, S., & Daley, C. E. (in press). Mixed methods research in school psychology: A mixed methods investigation of trends in the literature. *Psychology in the Schools.*

QSR International Pty Ltd. (2006). *NVIVO: Version 7. Reference guide.* Doncaster Victoria, Australia: Author.

Richardson, L., & St. Pierre, E. A. (2005). Writing: A method of inquiry. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 959–978). Thousand Oaks, CA: Sage.

Ryan, G. W., & Bernard, H. R. (2000). Data management and analysis methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 769–802). Thousand Oaks, CA: Sage.

Sandelowski, M. (2001). Real qualitative researchers don't count: The use of numbers in qualitative research. *Research in Nursing & Health, 24,* 230–240.

Schram, T. H. (2003). *Conceptualizing qualitative inquiry: Mindwork for fieldwork in education and the social sciences.* Upper Saddle River, NJ: Pearson.

Schwandt, T. A. (2001). *Dictionary of qualitative inquiry* (2nd ed.). Thousand Oaks, CA: Sage.

Sechrest, L., & Sidana, S. (1995). Quantitative and qualitative methods: Is there an alternative? *Evaluation and Program Planning, 18,* 77–87.

Shank, G. D. (2002). *Qualitative research: A personal skills approach.* Upper Saddle River, NJ: Merrill Prentice Hall.

Siegel, S., & Castellan, J. N. (1988). *Nonparametric statistics for the behavioural sciences.* McGraw-Hill, New York.

Silverman, D. (2001). *Interpreting qualitative data.* London: Sage.

Spradley, J. P. (1979). *The ethnographic interview.* For Worth, TX: Holt, Rinehart and Winston.

Stake, R. E. (2005). Qualitative case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed., pp. 443–466). Thousand Oaks, CA: Sage.

Tashakkori, A., & Teddlie, C. (Eds.). (2003). *Handbook of mixed methods in social and behavioral research.* Thousand Oaks, CA: Sage.

Tesch, R. (1990). *Qualitative research: Analysis types and software tools.* London: Falmer.

Todd, Z., Nerlich, B., & McKeown, S. (2004). Introduction. In Z. Todd, B. Nerlich, S. McKeown, & D. D. Clarke (Eds.), *Mixing methods in psychology: The integration of qualitative and quantitative methods in theory and practice* (pp. 3–16). Hove, East Sussex: Psychology Press.

Tuckett, A. G. (2005). Rigour in qualitative research: Complexities and solutions. *Nurse Researcher, 13,* 29–42.

Ulin, P. R., Robinson, E. T., & Tolley, E. E. (2005). *Qualitative methods in public health: A field guide for applied research.* San Francisco: Jossey-Bass.

Weitzman, E., & Miles, M. B. (1995). *Computer programs for qualitative data analysis.* Thousand Oaks, CA: Sage.

Wolcott, H. F. (2001). *Writing up qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.