

Mixed Methods Research: Are the Methods Genuinely Integrated or Merely Parallel?¹

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Using mixed methods within the confines of a single study can simultaneously broaden and strengthen the study. However, a continuing challenge is to maintain the integrity of the single study, compared to inadvertently permitting the study to decompose into two or more parallel studies. This article therefore deliberately focuses on those issues central to integrating mixed methods within a single study. The article points to pitfalls and remedies for integrating mixed methods throughout the conduct of a single study, ranging from the ways of splitting the study's initial research questions to the strategies for conducting analyses. The stronger the "mix" of methods throughout these procedures the more that researchers can derive the benefits from using mixed approaches.

This article briefly discusses specific pitfalls and reminders in designing and conducting mixed methods research. Ample arrays of mixed methods procedures exist elsewhere (e.g., Tashakkori & Teddlie, 1998; and the other articles in this volume). However, this article deliberately focuses on those issues central to integrating mixed methods within a single study. Without such integration, different methods may sit in parallel, potentially leading to multiple studies, and not the desired "mixing" of methods implicit in mixed methods research.

Using Mixed Methods Within the Confines of a "Single" Study

Mixed methods research plays an important if not essential role in educational research. Some investigators, including the guest editor of the present volume, have proposed mixed methods research as a "research paradigm whose time has come" (Johnson & Onwuegbuzie, 2004, p. 14). New paradigm or not, mixed methods research has been conducted in education research for a long time (e.g., Sieber, 1973).

Johnson and Onwuegbuzie (2004) provide the point of departure for the present article. They define mixed methods research as "the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts, or language into a *single* study [italics added]" (p. 17). The focus on a *single* study is critical to mixed methods research. Implicit in the prominent role played by a single study is the valuing of mixed methods in producing

converging evidence, presumably more compelling than might have been produced by any single method alone.

In contrast, if a research effort consists of multiple, related studies rather than a single study, little distinctive contribution arises from attending to the use of multiple methods. In fact, when investigators have permitted a research effort to decompose into multiple studies, mixed methods research may not have taken place at all.

Thus, forcing the use of multiple methods into the confines of a single study means avoiding a more traditional realm whereby separate studies have been conducted and later synthesized. Under that circumstance, a common cross-study question might be whether the findings from the separate studies had been confirmatory, replicative, or contradictory. But the cross-study analysis would resemble well-trodden paths involving research syntheses (e.g., Cooper & Hedges, 1994), meta-analyses (e.g., Lipsey & Wilson, 2001), or similar aggregative procedures. They all fall outside of (and would not be called) mixed methods research.²

Mixed Methods: Relevant Combinations Go Beyond the Quantitative-Qualitative Dichotomy

At the same time, this article goes beyond the initial definition by Johnson and Onwuegbuzie (2004) as well as other related works (e.g., Tashakkori & Teddlie, 1998) in one respect: Mixed methods research embraces much more than the traditional dichotomy between qualitative and quantitative research. Such a dichotomy once threatened to split the evaluation community (e.g., Lincoln, 1991; Reichardt & Rallis, 1994; Sechrest, 1992; Yin, 1994).

The dichotomous view masks the reality that there can be many different "mixes" or combinations of methods. For instance, in education research, some combination of experimentation and surveys—both being

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forms of “quantitative” methods—might deal better with the dual needs of addressing internal and external validity than either method alone (e.g., Berends & Garet, 2002). Thus, a single study combining experimentation and surveys would be an example of mixed methods research even though no qualitative method had been included in the study.

Likewise, scholars have long recognized different forms of “qualitative” methods (e.g., Guba & Lincoln, 1994; Trow, 1957), which also could be combined into a single, mixed methods study even though no quantitative method had been included. Finally, even within experimental methods the mixing of “group” designs and research (e.g., Campbell & Stanley, 1966) and “single-subject” research (e.g., Hersen & Barlow, 1976) could produce a powerful, single study of human behavior.

Once freed from the quantitative-qualitative dichotomy, the relevance and reality of a broad variety of “mixes” emerges. The broad variety recognizes the true diversity of the research methods used in education, ranging from clinical research to econometrics to experiments. The broad variety also recognizes the variants within specific methods, such as in-person and mail surveys, ethnographic and case study fieldwork, and laboratory and “natural” experiments. Figure 1 enumerates the broad diversity of methods available in education research. Referencing this exhibit, mixed methods research can exist whenever a single study includes methods *between* or—but to a much lesser extent—*within* the five circled items.

A review of these combinations and their potential utility, citing exemplary examples from published research, might make an important contribution to education research. However, the present article has a more modest goal. The article focuses mainly on one question: How to tighten the use of mixed methods so that they do in fact occur as part of a *single* study. The article briefly discusses the needed integration in carrying out five procedures.³ These include the relationship among the mixed methods with regard to a study’s:

1. Research questions
2. Units of analysis
3. Samples for study
4. Instrumentation and data collection methods
5. Analytic strategies

The claim is that, the more that a single study integrates mixed methods across these five procedures, the more that mixed methods research, as opposed to multiple studies, is taking place.

Research Questions

A single study no doubt starts with a single set of research questions. A frequent practice in allegedly carrying out mixed methods research is to split the original set of questions, so that different research methods address different questions.

In education evaluations, a typical split is for qualitative methods to address “process” questions and

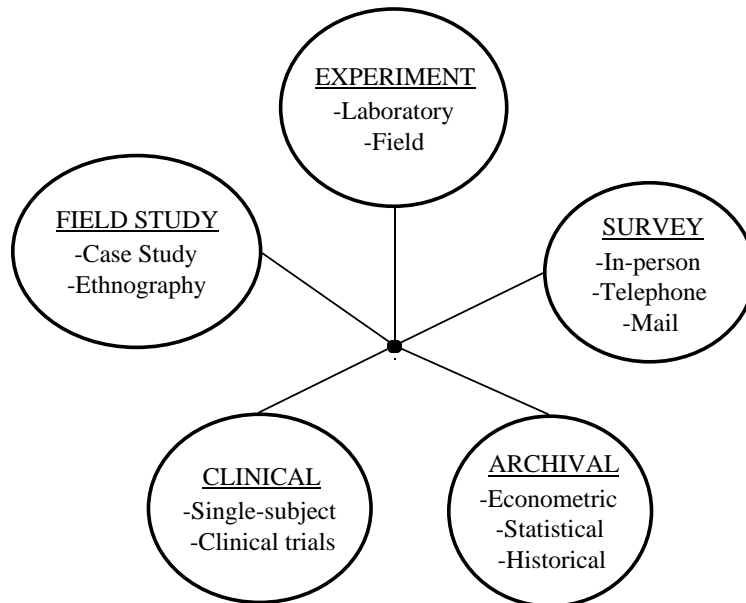


Figure 1. Mixed Methods Research: Broad Variety of “Mixes,” Beyond Simple Qualitative-Quantitative Combinations

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for quantitative methods to address “outcome” questions. Though this does not necessarily lead to the conduct of multiple studies, observe how a study would be strengthened if both the quantitative and qualitative methods each addressed some aspect of both process and outcome questions. Figure 2 illustrates both splits. A “process”-“outcome” split between, say, the survey and case study methods in an education evaluation potentially leads to separate studies (or “sub-studies”). The more desirable split has both the survey and case study efforts each addressing both “process” and “outcome” questions.

How research questions may be split or decomposed requires a lengthy discussion beyond the scope of this article. The simple suggestion is that the sharper the splits among the different research methods, the more readily a research effort, initially construed as a single study, might become a set of multiply-related studies.

Units of Analysis

Every study has an implicit if not explicit unit of analysis or assignment. The unit of analysis, though not necessarily the unit of data collection, holds a study together. The challenge in using mixed methods arises because different methods inherently favor different units of analysis—leading to another threat to the integrity of a single study.

Figure 3 again shows two contrasting conditions. The right side of this figure depicts a possibly classic example of an appropriately integrated study: a case study of a labor union, published 50 years ago by three eminent social scientists (Lipset, Trow, & Coleman, 1956). The study collected data at every level of this complex organization, using a variety of (quantitative

and qualitative) methods. Despite the varied methods, the researchers consistently maintained the same point of reference—which was the labor union as a single organization. Such persistent reference to this unit of analysis created the needed integrative force to blend all of the methods into a single study, eventually reported in the form of a 450-page book.

By comparison, the left side of Figure 3 depicts a prominent research investigation into community health care, illustrating how a single research effort decomposed into two isolated studies. The investigators’ original goal was to gain insight into the providers and clients of the set of health maintenance organizations (HMOs) in a particular community (Ginsburg, 1996). The multiple methods called for field studies that collected data from the set of HMOs, and a random-digit-dial (RDD) survey that covered a sample of community residents. However, the survey sample, not surprisingly, captured few clients, and the fieldwork, also not surprisingly, favored information about the service providers but not the clients. In fact, different units of analyses were inadvertently at work: by dint of its RDD design, the survey had defined a geographic area as the unit of analysis, whereas the fieldwork had defined a service delivery system. As a result, the findings from the two methods could not be integrated, leaving the original desire to study provider-client relationships unfulfilled.

Education research risks such decomposing, too. A typical study might have fieldwork about school districts and survey data from teachers. To prevent the study from decomposing into two isolated studies, the fieldwork might include focus groups of teachers, deliberately covering some of the same questions as those in the survey (but integrating the focus group findings with the rest of the fieldwork). Similarly, the

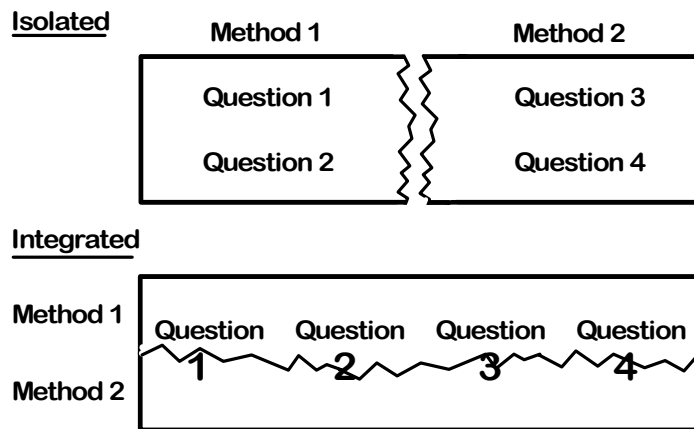


Figure 2. Research Questions: Isolated or Integrated?

survey sample might be stratified to reflect the district-related issues of study (e.g., different grade levels, subjects, or specialties, such as counseling), not just a representative sample of all teachers. In other words, each method can reach into the realm of the other, to produce a single mixed methods study.

Samples

Sampling procedures also need to be considered carefully in maintaining a single study while using mixed methods. Most desirably, the samples of each method may be nested within that of the other.

The nesting may be in either direction. For instance, fieldwork samples may be nested within survey samples, as in the by now routine situation where case studies are conducted on a small set of schools that are part of a much larger survey sample of schools. At COSMOS, such a sampling arrangement is part of an ongoing study of comprehensive school reform.

At the same time, the nesting can be in the other direction, too. For instance, in another study, COSMOS is evaluating public school choice initiatives. The fieldwork focuses on 13 districts that received special federal funding. Within each of these districts, a school survey deliberately covers those schools believed by the district to have participated in its choice initiative.

Figure 4 shows these two nesting patterns. They are but two of many combinations that might be pertinent for maintaining a single study while using mixed methods.

Instrumentation and Data Collection

Different methods tend to use different types of instruments. As examples, experiments typically use some kind of apparatus, including devices for recording behavior; surveys use questionnaires; case studies use field protocols; and ethnographies might use participant-observation.

Mixed methods research cannot change this array, as each method's preferred instrumentation is central to the method itself. However, despite the differences, the various instruments could contain directly analogous variables, if not actual items. The more that the items overlap or complement each other; the more that the mixed methods can be part of a single study. Conversely, greater divergence can again lead to multiple studies.

Within each of the two previously mentioned education evaluations underway at COSMOS—one examining public school choice and the other comprehensive school reform—the items in the various instruments were cross-walked. Some of the items were numeric (e.g., using district fieldwork documentation to define the number of students participating in a choice initiative, and having the same item asked in the school surveys). Other items were more conceptual and qualitative (e.g., using fieldwork to define the “comprehensiveness” of a whole-school reform initiative, and using an array of survey items to cover the same “comprehensiveness” concepts).

Figure 3. Unit of Analysis: Isolated or Integrated?

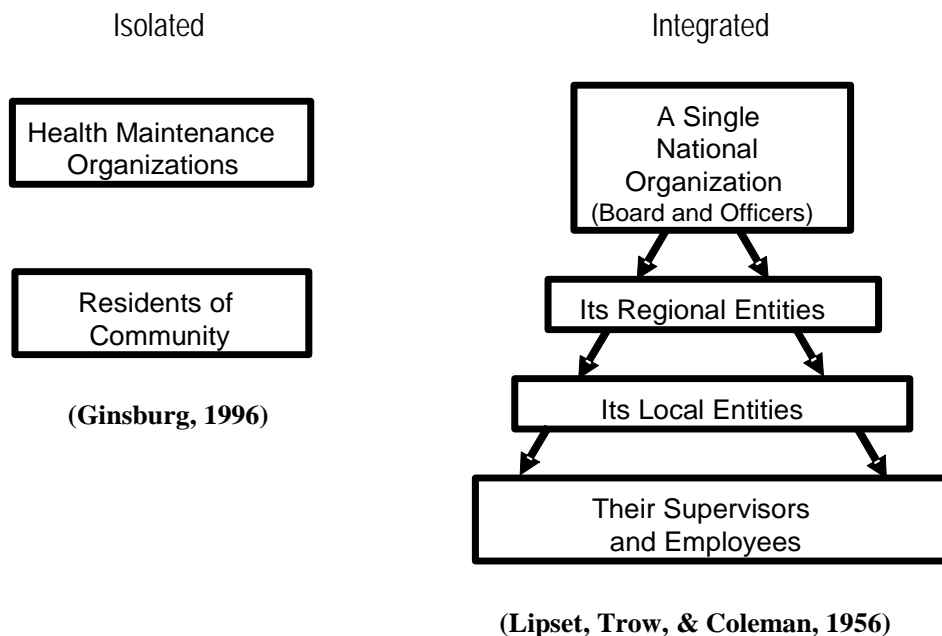
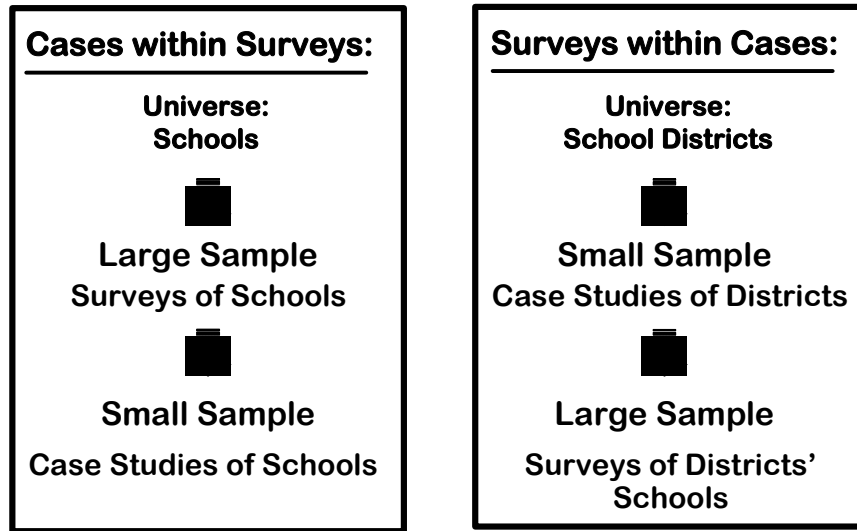


Figure 4: Samples: Integration Through Nested Arrangements



Although the measures were not exactly the same within each evaluation, the investigators deliberately tried to create directly comparable items, to assure the desired common scopes of data collection and variables. At the same time, the instruments were not limited to their common ground. By design, they also had many non-overlapping items. Figure 5 illustrates the desired cross-walking relationship when using different methods within the confines of a single study.

Analytic Strategies

Of all the procedures, analytic integration may be the trickiest of all. The mixed methods, if truly different methodologically, are likely to come with their own preferred and distinct analytic techniques. Under this circumstance, the goal is not to force the mixed methods into the exact same analytic routines. Rather, the goal is to design and carry out what might be called “counterpart” analyses. Such analyses should be formulated in directly analogous fashion, although they may use entirely different methodological techniques.

For instance, in one kind of formulation, mixed methods that are truly part of the same study can examine the relationships between the same dependent variable and associated independent variables. Such counterparts exist in the ongoing evaluation of comprehensive school reform, where the specifications of the survey’s regression models are mimicked by the analysis of “logic models” based on using case study methods. The analyses are counterparts in that both follow the same formulation—to study the student

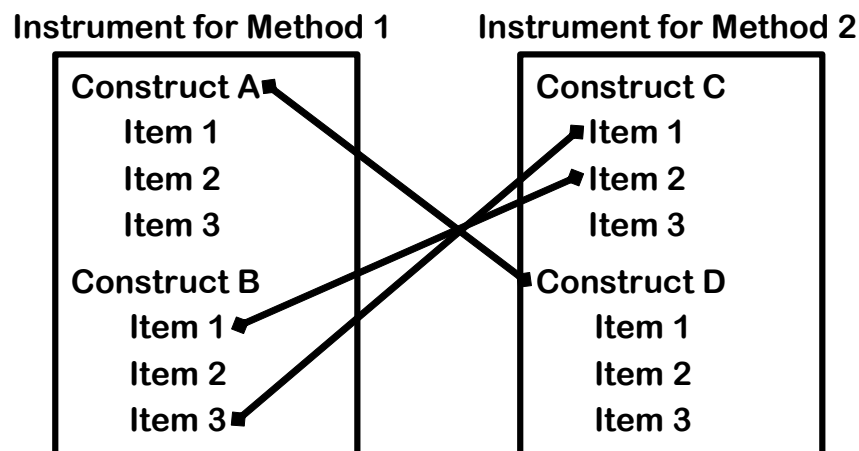
achievement trends that might be associated with schools that have been successfully reforming.

Another type of formulation disregards any relationship between dependent and independent variables and is more descriptive: Do the mixed methods at least tell the same story in describing either the dependent or independent variables alone? Such corroboration has been part of our evaluation of public school choice, where districts’ claims about schools’ choice participation from fieldwork data are juxtaposed with schools’ rendition of their own participation as expressed in a large-sample school survey.

As another variant of this descriptive formulation, do both the qualitative and quantitative (or the experimental and non-experimental) work suggests similar typologies of the subject being studied? Such counterparts have been part of our evaluation of comprehensive school reform, with the two main methods each trying to corroborate the same five-fold typology: Schools that are “reforming,” “on the way to reforming,” “just starting to reform,” “not reforming,” and “reforming, but with difficulty.”

These illustrations provide a start for thinking about yet other types of counterparts. The point is, if a counterpart relationship is entirely missing—as in the situation where two or more methods address wholly different dependent, independent, or descriptive variables—the mixed methods are likely to form separate studies, not a single study.

Figure 5. Instrumentation and Data Collection: Crosswalked Items and Variables



Summary

Summarizing this article is simple. The design and conduct of a single study involves an array of readily understood procedures, regarding: the research questions being addressed, the definition of the units of analyses, the structure of the samples being studied, the instrumentation and data collected, and the analytic strategies. The more that two (or more!) methods have been integrated into each of these procedures, the stronger the “mix” of methods. Conversely, if each method uses its own isolated procedures, the result will be separate studies using different methods. Though the studies may be complementary, they will not really represent mixed methods research.

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References

- Berends, M., & Garet M. S. (2002). In (re)search of evidence-based school practices: Possibilities for integrating nationally representative surveys and randomized field trials to inform educational policy, *Peabody Journal of Education*, 77(4), 28-58.
- Campbell, D. T., & Stanley, J. (1966). *Experimental and quasi-experimental designs for research*. Chicago, IL: Rand McNally.
- Cooper, H., & Hedges, L. V. (Eds.). (1994). *The handbook of research synthesis*. New York, NY: Russell Sage Foundation.
- Ginsburg, P. B. (1996). The RWJF community snapshots study: Introduction and overview. *Health Affairs*, 15(2), 7-20.
- Guba, E., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Lincoln, Y. S. (Eds.), *Handbook of qualitative research* (pp. 105-117). Thousand Oaks, CA: Sage
- Hersen, M., & Barlow, D. H. (1976). *Single case experimental designs: Strategies for studying behavior change*. New York, NY: Pergamon.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14-26.
- Lincoln, Y. S. (1991). The arts and sciences of program evaluation, *Evaluation Practice*, 12(1), 1-7.
- Lipset, S.M., Trow, M., & Coleman, J. (1956). *Union democracy: The inside politics of the international typographical union*. New York, NY: Free Press.
- Lipsey, M., & Wilson D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.
- Reichardt, C. S., & Rallis, S. F. (1994). Qualitative and quantitative inquiries are not incompatible: A call for a new partnership. In C. S. Reichardt & S. F. Rallis (Eds.), *The qualitative-quantitative debate: New perspectives* (pp. 85-92). San Francisco: Jossey-Bass.
- Sechrest, L. (1992). Roots: Back to our first generation. *Evaluation Practice*, 13(1), 1-7.
- Siebert, S. D. (1973). The integration of fieldwork and survey methods. *American Journal of Sociology*, 78(6), 1335-1359.

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PARALLEL?

- Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: Combining qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.
- Trow, M. (1957). Comment on participant observation and interviewing: A comparison. *Human Organization, 16*, 33-35.
- Yin, R. K. (1994). Evaluation: A singular craft. In C. S. Reichardt & S. F. Rallis (Eds.), *The qualitative-quantitative debate: New perspectives* (pp. 71-84). San Francisco: Jossey-Bass.

Notes

¹ This article is based on a paper presented by the author at the 2006 Annual Meeting of the American Educational Research Association.

² The discussion here refers to the more traditional syntheses, which typically aggregate across individual studies that have used the same general method. However, the role of research syntheses can be enhanced to include the synthesis of studies using different methods (see Sandelowski, Voils, & Barroso in this volume).

³ For the purpose of clarity, each procedure is discussed separately. In real-life study designs, the procedures may be sufficiently related that two or more of them work in tandem.