Review of Educational Research
Spring 2009, Vol. 79, No. 1, pp. 395–430
DOI: 10.3102/0034654308326349

Advancements in Research Synthesis Methods: From a Methodologically Inclusive Perspective

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The dominant literature on research synthesis methods has positivist and neo-positivist origins. In recent years, the landscape of research synthesis methods has changed rapidly to become inclusive. This article highlights methodologically inclusive advancements in research synthesis methods. Attention is drawn to insights from interpretive, critical, and participatory traditions for enhancing trustworthiness, utility, and/or emancipatory potential for research syntheses. Also noted is a paucity of the literature that builds connections between methodologically diverse segments of the literature on research synthesis methods. Salient features of a methodologically inclusive research synthesis (MIRS) framework are described. The MIRS framework has been conceptualized by distilling and synthesizing ideas, theories, and strategies from the extensive literatures on research synthesis methods and primary research methods. Rather than prescribe how a research synthesis should be conducted or evaluated, this article attempts to open spaces, raise questions, explore possibilities, and contest taken-for-granted practices.

KEYWORDS: qualitative research, research methodology, research utilization, research synthesis.

Research syntheses play an important role in disseminating research knowledge and in shaping further research, policy, practice, and public perception. Commendable efforts have been made to enhance rigor in research syntheses. However, the literature on research synthesis methods from interpretive, participatory, and critical perspectives is relatively sparse and often not discussed within the dominant literature on meta-analysis. Furthermore, there is a paucity of literature that builds connections between these different parts of the literature on research synthesis methods.

In this article, we highlight advancements in research synthesis from a methodologically inclusive perspective. We emphasize expanding possibilities within research syntheses, rather than report the relative popularity of contemporary research synthesis methods. Then, we describe the salient features of a MIRS

framework, which has been conceptualized by distilling and synthesizing diverse ideas, theories, and strategies from the extensive bodies of literature on research synthesis methods and primary research methods.

Methodological Underpinnings

In this article, we subscribe to a complementarity diversity thesis, with the premise being that different paradigms exist and serve complementary purposes in educational research (Walker & Evers, 1999). Engaging with fallibilist pluralism (Schwandt, 2005), we try to stretch the conventional boundaries of research synthesis methods. Our goal is to contest the hegemony of meta-analytic methods by constructing a methodologically inclusive counternarrative about the advancements of research synthesis methods. As such, this article is based on a larger project in which a MIRS framework (Suri, 2007b) was conceptualized to address an overarching question: Given that contemporary educational research is marked by diversity, complexity, and richness of purposes, methods, and perspectives, how can such variety and complexity be accommodated and reflected at the level of synthesizing educational research?

In developing the MIRS framework, we were methodologically inclusive at four levels. First, we explored the possibilities of including a range of methodologically diverse primary research reports into research syntheses. Second, we explored the opportunities offered by adapting the techniques and perspectives from a variety of primary research methodologies to the process of a research synthesis. Third, we drew on ideas from several formally proposed methods of research synthesis, oriented along diverse methodological approaches. Fourth, we drew on the methods utilized in diverse exemplary research syntheses.

We began by conducting extensive searches to cast a wide net and to get a general feel for the literature on research synthesis methods and contemporary primary research methods. Subsequently, purposeful sampling was employed to cover those themes that had the potential for enhancing inclusivity and rigor in research syntheses but were not covered well within the retrieved literature. In particular, we searched for literature that had the potential to inform the process of synthesizing research from interpretive, critical, and participatory perspectives. For each domain of literature, selected books and articles were retrieved by searching relevant electronic databases—including ERIC, Australian Education Index, PsychInfo, Web of Science, and Cinhal—and library catalogues of three Australian universities. Keyword descriptors for publications on research synthesis methods included *research synthesis*, *meta-analy**, *meta-ethnography*, *meta-synthesis*, *meta-study*, *qualitative meta-analysis*, *qualitative synthesis*, *aggregated analysis*, and *synthesis of qualitative research.* Author searches were conducted with the names of key methodologists who were publishing in the field of research synthesis methods. Several exemplary reviews with typical and atypical methodological features were retrieved. In particular, all the reviews that had been awarded Review of Research by the American Educational Research Association (2006) since 1976 were retrieved. Research methodology texts that were recently published and/or highly recommended by methodologists from a spectrum of methodologies were pursued. References from the bibliographies of these selected publications were pursued to illuminate specific points. These purposeful searches allowed us to

focus on issues of particular relevance to contemporary educational research while drawing on methodological insights from the fields of education, psychology, sociology, anthropology, and health care.

Several experienced methodologists were consulted in the process of evaluating, interpreting, and distilling relevant information from the retrieved literature. Feedback was also sought as we iteratively questioned and refined our constructions of connected understanding across the distilled information. Techniques employed for constructing and refining our connected understandings included the following: preliminary content analysis (Mays, Pope, & Popay, 2005a); interpretive and hermeneutic comparisons (Zimmer, 2006); writing as a method of inquiry (Richardson, 2001); and problematizing, interrogating, unpacking, and adapting individual texts informed by critical sensibilities. Strategies for enhancing the quality of connections included identifying disconfirming pieces of information, exploring rival connections, using multiple lenses, maintaining a questioning gaze, reflexivity, and updating with the recent literature (Suri, 2007b).

Methodologically Diverse Literature on Research Synthesis Methods: Describing the Landscape

The vast, sometimes seemingly disparate literature on research synthesis methods appears in several forms. From a methodological perspective, this substantial body of literature can be partitioned into the following subsets, with several overlaps:

Statistical research syntheses: extensive literature on discussions and applications of methods which emphasizes statistical integration of primary research reports, such as meta-analysis and best-evidence synthesis.

Systematic reviews: recent literature on systematic reviews which emphasizes a priori protocols, comprehensive searches, transparency to reduce biases, and the involvement of stakeholders in the review process.

Qualitative research syntheses: relatively sparse but rapidly growing literature on various formally proposed individual methods for synthesizing qualitative research.

Qualitative syntheses of qualitative and quantitative research: relatively sparse but definitely growing literature on various qualitative methods for synthesizing qualitative and quantitative research.

Critical impetus in reviewing research: relatively sparse published discussions on a range of critical issues associated with the production and use of research syntheses, such as their forms and purposes, politics of representation, frequent sources of errors and biases, and suggestions for reducing some commonly found biases.

Exemplary syntheses: explicit critiques or taxonomies of published syntheses and implicit features of exemplary syntheses.

In this section, we review two aspects of each subset of literature from a methodologically inclusive perspective. First, we summarize how this subset of literature has advanced the methodology of research synthesis. Then, we critique each subset by unpacking the literature published by its supporters, as well as the commentaries from its critics.

Statistical Research Syntheses

Glass (1976) coined the term *meta-analysis* to refer to the process of statistical integration of primary research findings.[1] To reduce unstated subjectivity in a synthesis, meta-analysts: formulate clear hypotheses with operational and conceptual definitions of key constructs; state explicit criteria for the inclusion and exclusion of primary research; conduct explicit and comprehensive searches for relevant studies; follow explicit procedures for extracting relevant information from each study; convert summaries of individual studies to appropriate effect sizes; attach appropriate weights to individual effect sizes, according to their sample sizes; statistically integrate these findings into a cumulative effect size after adjusting for their variances; identify confidence intervals associated with the cumulative effect; and conduct outlier diagnosis and homogeneity analysis to identify potential moderators of the effect (Cooper, 1998; Glass, 2006).

Meta-analytic literature contains sophisticated discussions of different types of effect sizes suitable for different study designs, formulae that allow conversion between different effect size indices, guidelines for estimating an effect size when some information is not reported in the primary research report, appropriateness of various effect indices for analyzing different types of data (Schulze, 2004; Valentine & Cooper, 2003), strengths and weaknesses of various search strategies, different types of publication biases and search biases (Rothstein, College, Turner, & Lavenberg, 2004), strategies for identifying and taking into account potential publication biases (Begg, 1994; Petticrew & Roberts, 2006), and several types of sensitivity analyses to examine the dependence of the synthesis findings on the assumptions made about the nature of the data (Matt & Cook, 1994; Sirin, 2005).

Since the conception of meta-analysis, several meta-analysts in education have recommended that meta-analyses be supplemented with rich narrative discussions of quantitative and qualitative information (Cook & Leviton, 1980; Light & Pillemer, 1982, 1984). Accordingly, different variations of meta-analysis have been proposed to include qualitative information, such as best-evidence synthesis (Slavin, 1986) and Bayesian approaches (Louis & Zelterman, 1994). Over the past three decades, numerous investigations have been conducted to examine the robustness of meta-analytic techniques and to explore methodologists' strategies for refining these techniques from diverse disciplinary backgrounds, including statistics, psychology, education, health care, agriculture, and physics. Meta-analyses are so widely prevalent in education, especially in the United States, that the method has been referred to as "a minor academic industry, as well as a commercial endeavour" (Glass, 2006, p. 436). Numerous meta-analyses have been published in the *Review of Educational Research* (*RER*). Reflecting this dominance of meta-analytic methods, the recent publication of the American Educational Research Association titled *Handbook of Complementary Methods in Education Research* (Green, Camilli, & Elmore, 2006) includes only two chapters devoted to research synthesis methods: "Meta-Analysis: The Quantitative Synthesis of Research Findings" (Glass, 2006) and "Research Synthesis: Effect Sizes" (Thompson, 2006). Both chapters exclusively discuss meta-analytic methods with no recognition of any other form of research synthesis.

By systematization of the entire process of a research synthesis, meta-analysts make a worthy contribution in advancing the methodology of research synthesis.

However, the meta-analytic literature gives little recognition to a variety of qualitative methods of primary research and research synthesis. The fundamental premise of a meta-analysis is that every primary research finding that is included in the meta-analysis should be converted into an effect size. It presumes that all that is worth knowing in education is measurable because it ignores that which is not. Also associated with the meta-analysis is a belief in effect size as a universal construct that can be compared and integrated across multiple contexts (Petticrew & Roberts, 2006). Within the meta-analytic literature, even the discussions about including qualitative information tend to overlook the following: the potential for qualitative research to structurally inform synthetic findings, the incommensurabilities between quantitative and qualitative research, and the opportunities for conducting research syntheses oriented along different methodologies. It would be limiting to inform educational policies and practices by syntheses based exclusively on measurable concepts and statistical integration of verifiable relationships between two or more variables. We need, in addition to meta-analyses, multiple forms of research synthesis that reflect the diversity and complexity in contemporary educational research.[2]

Systematic Reviews

Systematic reviews are frequently associated with the political movement of evidence-based education, which is gaining momentum in several nations, such as the United Kingdom, the United States, Canada, some European Nations, and Australia (MacLure, 2005; Slavin, 2002). Systematic reviews are becoming common in disciplines such as health care, education, social sciences, and public policy. Organizations such as the Cochrane Collaboration (n.d.), the Campbell Collaboration (n.d.), EPPI-Centre (n.d.), and Centre for Reviews and Dissemination (2006) have been set up to support the production and dissemination of systematic reviews of research. Some of these organizations are being heavily funded and politically supported by federal and corporate agencies (Harlen & Crick, 2004). Particularly noteworthy are systematic reviewers' intentions: to seek feedback from users of educational research when formulating synthesis questions; to regularly update their reviews with the new relevant studies in the field; to reduce duplication through explicit international collaborations; to methodologically support groups that are interested in conducting systematic reviews; to develop useful databases of intervention studies and systematic reviews to facilitate their dissemination and access; and to strategically utilize technology to update and disseminate relevant information (Campbell Collaboration, n.d.; Constable & Coe, 2000; EPPI-Centre, 2001). Like meta-analysts, most systematic reviewers emphasize: a priori synthesis protocols; explicit inclusion/exclusion criteria; explicit criteria for evaluating methodological quality of individual studies; comprehensive searches for all relevant studies; and objectivity and transparency throughout the synthesis process (Davies, 2004; Petrosino, Boruch, Rounding, McDonald, & Chalmers, 2000; Pring, 2004).

There are two methodologically distinct perspectives prevalent among systematic reviewers (Hammersley, 2003). The first group is dominated by meta-analysts who recommend that an ideal systematic review do the following: have clearly specified a priori hypotheses about the effectiveness of different interventions, hold randomized controlled trials as the gold standard for individual studies, and employ

statistical techniques for integrating individual quantitative findings (e.g., Badger, Nursten, Williams, & Woodward, 2000; Boruch, Cooper, Herman, & Fleischman, 2003; Centre for Reviews and Dissemination, 2006; Davies, 2004; Shadish & Myers, 2004). Despite the various criticisms against meta-analyses, this group of systematic reviewers has established itself as "a whole industry [in] educational research" (Davies, 2000, p. 372), particularly in the United States.

The second group of systematic reviewers is a minority group who have started doing the following: including qualitative research in systematic reviews; developing efficient search strategies, appraisal criteria, and synthesis techniques for primary qualitative research; engaging various stakeholders in formulating and critiquing their reviews' questions, protocols, and summary reports; and stressing that systematic reviews must be complemented with other forms of reviews to facilitate informed decision making by multiple stakeholders (e.g., Andrews, 2005; Coe, 2004; Gough, 2004; Petticrew & Roberts, 2006). Sample initiatives from this group include a recent publication, *Systematic Reviews in the Social Sciences: A Practical Guide* (Petticrew & Roberts, 2006), which provides useful hands-on guidelines for conducting systematic reviews of quantitative and qualitative research; systematic reviews of qualitative research prepared by the EPPI-Centre (n.d.); the establishment of the Cochrane Qualitative Research Methods Group and the Campbell Process Implementation Methods Group (Finch, 2005); the establishment of the Qual–Quan Evidence Synthesis Group (2004), funded by the Economic and Social Research Council Research Methods Programme (2006); and a collection of articles presented by supporters and critics of systematic reviews in an edited volume titled *Evidence-Based Practice in Education* (Thomas & Pring, 2004).[3]

Critiquing from a methodologically inclusive perspective, many systematic reviewers exclude a large proportion of research on the grounds of poor methodological quality using an evaluation criteria that is biased against certain paradigmatic orientations. Such unacknowledged bias raises serious questions about the validity and generalizability of review findings (Pawson, Greenhalgh, Harvey, & Walshe, 2005). Sometimes, systematic reviewers discuss qualitative research as a broad category and so do not distinguish between different types of qualitative research (Dixon-Woods, Agarwal, Young, Jones, & Sutton, 2005). Even in their inclusion of qualitative research, systematic reviewers often include only interpretive qualitative research and seek ideologically neutral evidence (e.g., Gough, 2004). They appear to be divorced from critical perspectives, with little inclusion of openly ideological research (Gallagher, 2004).

The rhetorical effect of terms such as *evidence-based practice*, *systematic reviews*, *clarity*, *comprehensive*, *reliable*, *objectivity*, and *replicable* not only discredits any opposition but also has the political impact of favoring positivism. Ironically, these key terms that are the trademark of systematic reviews are variously operationalized by different groups of systematic reviewers. The problem here is not the subjectivity associated with these terms but the systematic reviewers' denial of subjectivity (Hammersley, 2001, 2004; Peile, 2004; Pring, 2004). The problem lies in openly discrediting ideological research with an implicit political agenda (Gallagher, 2004; MacLure, 2005).

Most systematic reviewers unproblematically value a priori protocols, exhaustive searches, and objectivity and transparency of process. Accordingly, there is little discussion in this literature about advantages of emergent synthesis designs

and purposeful sampling (Booth, 2001). In reality, transparency is always subjective, partial, and purposefully informed where each way of showing is mirrored by a way of concealing that may or may not be deliberate. Prescribing a priori rules to enhance objectivity, transparency, and clarity could worsen the quality of reviews by discouraging reflection on important process decisions (MacLure, 2005). "Instead of the systematic/unsystematic distinction what is required is a non-evaluative typology dealing with different kinds of focus that reviews can have" (Hammersley, 2003, p. 5). Through the MIRS framework, we attempt to provide one such typology.

Qualitative Research Syntheses

Qualitative research synthesists[4] assert that the efforts involved in a rigorous research synthesis are comparable with those required in a rigorous primary research study. Furthermore, they distinguish (a) systematic efforts of synthesizing qualitative research from (b) the intuitive reviews of literature that meta-analysts refer to as *traditional discursive reviews*.[5] Among the early methods for synthesizing qualitative research, Noblit and Hare's meta-ethnography (1988) is the most cited method. To conceptualize this method, Noblit and Hare drew insights from common interpretive traditions known by various descriptors, such as ethnographic, interactive, qualitative, naturalistic, hermeneutic, and phenomenological. Distinguishing features of their approach include an emphasis on being "interpretive rather than aggregative" and "constructing interpretations, not analyses" (p. 11), being inductive rather than using a prior conceptual framework, employing purposeful sampling rather than exhaustive sampling for selecting primary research studies, being consciously aware of one's own subjectivity, and paying attention to the target audience's discourse.

Noblit and Hare (1988) used the term *metaphor* to refer to "themes, perspectives, organizers, and/or concepts revealed by qualitative studies"; they recommended "metaphoric reductions" to "achieve both abstraction and complexity, and create translations that preserve the relations between concepts" (p. 14). These metaphoric reductions are then translated into one another and expressed as analogies through "idiomatic translations" of salient categories of meaning. A meta-ethnography takes varied forms depending on how individual accounts are related to one another: "as a reciprocal translation (essentially similar and subject to direct translation), as a refutation (involving translation of refutations as well as accounts), or in a line of argument (an analogy about a set of parts to some whole)" (pp. 81–82). Based on this initial assumption about the relationship between individual accounts, a meta-ethnographer makes appropriate translations, checks this initial assumption, and constructs a text that presents the synthesis process and product in a suitable form for the target audience.

Noblit and Hare (1988) developed meta-ethnography to synthesize three educational ethnographic studies in which they were involved. Since then, it has been applied and adapted by methodologists from several disciplinary orientations. However, most of the literature henceforth on synthesizing qualitative research studies has been published by health care researchers. As noted later in this article, educational research synthesists have been more interested in issues associated with synthesizing methodologically diverse research and in synthesizing research from critical perspectives.

Since the mid-1990s, several qualitative synthesists from health care have acknowledged that the emphasis of qualitative research on particularities and complexities of individual contexts appears to be at odds with any synthetic effort. Yet they assert that some form of synthesis is essential to enhance the practical value of qualitative research in policy making and informing practice at a broader level. In recent years, they have conducted a large number of qualitative research syntheses and subsequently published numerous insightful discussions on issues regarding the appraisal and synthesis of qualitative research. Most of them build on Noblit and Hare's meta-ethnography (1988) and recommend synthesizing qualitative research to develop a full understanding of a phenomenon, rather than generate predictive theories (Dixon-Woods, Shaw, Agarwal, & Smith, 2004; Jensen & Allen, 1994, 1996; Popay, Rogers, & Williams, 1998; Sandelowski, 2002; Sandelowski & Barroso, 2002, 2003a, 2003b; Sandelowski, Docherty, & Emden, 1997; Walsh & Downe, 2005; Whittemore, 2005).

Some other qualitative research synthesists from health care assert that qualitative research can be usefully synthesized to develop midrange theory that explains and predicts patterns of behavior for designing interventions informed by qualitative evidence (e.g., Eastabrooks, Field, & Morse, 1994; Zimmer, 2006). Paterson and colleagues (Paterson, Thorne, Canam, & Jillings, 2001) present the most comprehensive discussion of synthesizing qualitative research in their monograph titled *Meta-Study of Qualitative Health Research*, in which they recommend their method of meta-study for developing and refining midrange theory with four discreet components: "the analytic components of meta-data-analysis, meta-method, and meta-theory, and the synthetic components of meta-synthesis" (p. 13). Particularly noteworthy is the detailed attention they pay to "the highly significant ways in which theoretical, methodological, or societal contexts" (p. 5) shape the studies being synthesized. Fingfeld (2003) has developed a useful typology of contemporary methods of qualitative research synthesis in health care, clustering a range of methods according to their purpose and various methodological features.

Critiquing from a methodologically inclusive perspective, we note that Noblit and Hare (1988) provide insightful guidelines for synthesizing a small number of ethnographic accounts in education. However, they do not discuss the complex issues involved in searching, appraising, and synthesizing a large number of methodologically diverse qualitative research studies. Qualitative research synthesists from health care have collectively identified useful strategies and important issues. However, they often limit their discussions to interpretive qualitative research, and they do not include critical and participatory perspectives that are common in educational research. In summary, most of the formally proposed qualitative methods of synthesizing qualitative research do not address several difficult questions, such as: How can we include openly ideological research in a synthesis? How can a synthesist draw on various arts-based, critical, and postmodern sensibilities through every phase of a research synthesis?

Qualitative Syntheses of Qualitative and Quantitative Research

Several scholars assert that important questions about educational, health, and social phenomena must be informed by syntheses of both qualitative and quantitative studies. But they also reason that including qualitative studies in a quantitative

synthesis is impractical owing to their lack of common metric. Hence, they recommend qualitative syntheses of methodologically diverse studies on a similar topic. A large proportion of rigorous reviews published in educational journals such as *RER* and *Review of Research in Education* (*RRE*) have been qualitative reviews of qualitative and quantitative research. Sample publications about such methodologically inclusive qualitative syntheses include Zhao's classification of multiparadigmatic meta-study from sociology (1991); Bair's "integrative and expansionist" method of "meta-synthesis" (1999, p. 4), which was developed to synthesize research on the attrition and persistence of doctoral students (Bair & Haworth, 1999); Ogawa and Malen's "exploratory case study approach" (1991b, p. 265; along with its critiques published in the *RER*: Ogawa & Malen, 1991a; Patton, 1991; Yin, 1991), which draws on ideas from meta-analysis and the case survey method to synthesize research and nonresearch papers; and comparisons published by health care researchers between various quantitative and qualitative approaches that have the potential to synthesize qualitative and quantitative evidence (Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005; Dixon-Woods, Agarwal, Young, et al., 2005; Mays et al., 2005a, 2005b; Pope, Mays, & Popay, 2007).

Particularly noteworthy is Pawson's method of realist synthesis (2002) to develop theory from successful (as well as nonsuccessful) implementations of a program. Realist reviews explain "what works for whom, in what circumstances, in what respects and how" (Pawson et al., 2005, p. 21). The synthesist begins by identifying the key theories underlying a phenomenon to then formulate a refined theory. Afterward, the synthesist successively applies this theory to explain a number of successful and unsuccessful cases. With each application, the synthesist refines the theory. The salient features of realist synthesis include purposeful sampling, methodological inclusivity (by including studies with diverse qualitative and qualitative designs), involvement of stakeholders in identifying the purpose, and tentative findings (which inform decision makers of the likely implications of different decisions in different situations, rather than what works). The method, along with examples of how it has been applied in three contexts to inform public policy, is described well in a monograph titled *Evidence-Based Policy: A Realist Perspective* (Pawson, 2006).

Given the methodological diversity of educational research on most topics, qualitative syntheses of quantitative and qualitative research is an appealing concept. The methods discussed in this section are relatively new and have not been applied and tested in a large number of contexts. Furthermore, they do not address the complex questions associated with including in a synthesis research reports that are openly ideological or use arts-based methods, even though these methods are gaining popularity within some circles in education. Nonetheless, they offer promising directions for synthesists to pursue.

Critical Impetus in Reviewing Research

Since the late 1990s, several articles that have been published in reputable educational journals, such as *RER* and *British Educational Research Journal*, have inspected, interrogated, and expanded boundaries of the processes involved in the production and use of educational research reviews. Topics of such critical discussions have included the following: complexities and tensions inherent in decisions

that influence production and use of reviews (e.g., sponsorship, authorship, intended audience, structure, scope, selection criteria, and nature of conclusions drawn; Foster & Hammersley, 1998); reflexivity in reviews of reviews (Gillborn & Gipps, 1998); reformulation of "the categories of knowledge through the intersection of epistemology, culture, and politics in education" (Popkewitz, 1999, p. 398); a genealogical examination of curriculum reviews published in *RER* to reveal how the "discursive practices embedded in the language in which our research reviews are framed creates the kind of thinking that constructs fields of inquiry in certain ways and not others" (Franklin, 1999, pp. 358–359); an historical examination of the issues of "voice, identity, and representation" (p. 381) to question the unproblematic conception of voice as a "liberatory or emancipatory strategy in re-viewing reviews" (Baker, 1999, p. 377), or in other words, "How can we include everybody's voice equally in the framing of reviews?" (p. 365); a historical examination of the issues in *RER* published from 1931 (when it was known as *The Review*) to 1999, to identify the evolving trends in the various features of these reviews, such as the nature of the included primary research in terms of substantive content area, scope and coverage, methods employed, probable authors, intended audience, editorial presence, and forms of reviews (Grant & Graue, 1999).

Reflecting critically on their editorial experiences, past editors of *RER* and *RRE* have raised concerns over various issues, such as factors besides quality of the manuscripts that sometimes influence the peer-review process of research reviews (e.g., "uninformed reviews, ideological or political bias in the review process, ethical conflicts of interest, and the mistaken views of fairness held by the field"; Murray & Raths, 1996, p. 418); little attention paid to critiques of research reviews (Murray, Raths, & Blanteno, 1996); and the inherently "social" and "situated" nature of the process and product of research reviews where it is not recognized as "new" knowledge and is thus marginalized in its "relative status in the institutionalized and increasingly marketized hierarchies of legitimate knowledge" (Apple, 1999, pp. 344–345).

In recognition of the need to move beyond positivist reviews, there have been calls for the following: "reviews that could surprise, reveal how meaning varies by context, and enlarge human discourse" (Eisenhart, 1998, p. 394), to highlight the cracks, tensions, and fractures in our understanding of a phenomenon, rather than to build a comprehensive understanding of a field; reviews that reveal how "we are all immersed within processes which are connected to and constitutive of the disparities and inequalities which characterize the educational landscape" (Meacham, 1998, p. 402); reviews that are tools for "recasting both the academic literature and the lived" and reviews that can afford "robust disorientation possible at the internal-external nexus of power" (Livingston 1999, pp. 10, 12); poststructural reviews that construct "situated, partial, perspectival" understandings (Lather, 1999, p. 3) rather than any totalizing grand meta-narratives.

In critiquing the hegemonic dominance of systematic reviews, critical scholars alert us to several contentious issues, such as problematics of the formalization and systematization of research synthesis processes (e.g., Gallagher, 2004; MacLure, 2005), social and political "dynamics of the ways in which evidence comes to be used" (Clegg, 2005, p. 425), and "diverse commentaries on audiences and readers, and on interconnections between research/researchers, policy/policy-makers, and

practice/practitioners" (Hustler, Edwards, & Stronach, 1998, p. 500). Many of these criticisms apply to most formal research synthesis methods and not just systematic reviews. It is crucial that all research synthesists and readers of syntheses engage with these critical conversations to enhance reflexivity in producing and interpreting research syntheses.

Exemplary Syntheses in Education

A clear distinction between knowledge from research, practice, and policy is not often feasible in education, because all these domains of knowledge constitute, and are constituted by, one another (Ward, 1983). Since the early 1980s, there have been several attempts to categorize aspects of reviewing knowledge in education, including structure, types, and synthesis of knowledge (Ward, 1983); epistemological problems in knowledge synthesis (Strike & Posner, 1983a); types of synthesis and criteria for evaluating them (Strike & Posner, 1983b); categorizations of literature reviews (Boote & Beile, 2005; Cooper, 1988); and discussions of commonly observed sources of errors and biases in research reviews in education (Dunkin, 1996).

Every year, the American Educational Research Association (2006) gives a Review of Research award in recognition of an outstanding review-of-research article appearing in *RRE* or *RER*. By going through these award-winning reviews, we found several common methodological features:

- conceptually substantiated and well-bound coverage of the substantive topic;
- rigorous critique of previous reviews;
- inductive approach to identifying the common assumptions, theories, methods, and findings emerging from extant research;
- critical analyses of extant research;
- coherent structuring of the report along meaningful themes;
- providing a unique conceptual framework or perspective to think about the topic, future research, practice, and policy; and
- providing clear implications for researchers, practitioners, and policy makers.

Even though these features are not explicitly stated in the literature, we believe that they must be an integral part of every quality synthesis.

MIRS Framework

In the previous section, we highlight how the process of a research synthesis has been problematized from various perspectives within texts on research synthesis methods. However, there is a paucity of literature that brings together these varied discussions into a coherent framework. Furthermore, it is crucial that ideas from interpretive, participatory, and critical scholarships be given visibility within the mainstream literature on research synthesis methods.[6] As the complexity and diversity grows within the methods of primary research, it becomes essential that the range of opportunities and complexities inherent in synthesizing such an evidence base be recognized. Our conceptualization of the MIRS framework is an initiative in this direction to encourage educational researchers to think beyond the conventional boundaries of research synthesis methods.[7] It is a purposeful synthesis of ideas,

strategies, and techniques from diverse segments of literature on research synthesis methods and primary research methods. Our goal is to encourage conversations that reflect and accommodate the current complexity and richness of primary research methods and research synthesis methods in education. As such, we divide this section into three subsections. First, we identify transcendental trends in the literature on research synthesis methods. Next, we identify guidelines for all quality research syntheses. Finally, we identify six phases of considerations in the process of a research synthesis.

Making Explicit Some Overarching Trends

Even though a plethora of terms are being used with multiple connotations, all research synthesists uphold several assumptions.[8] In this subsection, we explicitly discuss some of these assumptions and illuminate some evolving trends in the literature of research synthesis methods under the two subcategories: first, complementary purposes of primary research and research syntheses; second, changing landscape of the literature on research synthesis methods.

Complementary purposes of primary research and research syntheses. A common belief underlying all research synthesis methods is that primary research and research syntheses have complementary purposes.[9] Although some questions are amenable to a research synthesis, others are more amenable to primary research methods (Petticrew & Roberts, 2006). Primary research can capture greater detail of the context being studied. Furthermore, a primary research study often has the virtue of being close to its context; hence, its findings are more likely to be transferable to similar contexts. It is naïve to assume that a research synthesis encompasses all aspects of its constituent studies. Because a research synthesis draws on parts of primary research studies, it is inevitable that some of the rich contextual information found available in reports of primary research be sacrificed.

The value-addedness of a research synthesis lies to a significant extent in its ability to bring to light new ways of looking at a set of primary research studies. The evidence of a research synthesis is more complex, refined, and sophisticated. A research synthesis advances knowledge in a field by identifying transcendental features and patterns across a number of studies. Transferability of an educational phenomenon can be enhanced by systematically examining a range of contexts in which it has been observed. Subtle nuances that form the essence of a phenomenon can become noticeable through systematic comparisons, to make explicit similarities and variations between individual studies examining that phenomenon. Research syntheses play an important role in informing policy, practice, public perception, and further research by making explicit connections between individual studies. Hence, issues of rigor are important in every research synthesis. In sum, research synthesis is a methodology in its own right, involving numerous tasks and critical decisions. Efforts and resources required in a rigorous research synthesis are comparable to those required in a rigorous primary research study. It is crucial that synthesists share, discuss, debate, and critique multiple aspects of research synthesis processes to improve quality of research syntheses (Dunkin, 1996).

Changing landscape of the literature on research synthesis methods. Advances in methods of primary research and research synthesis should (and, to some extent,

TABLE 1
Evolving methods of primary research and research synthesis in education

Primary research	Research syntheses
1940s and 1950s: Small number of studies employing similar methods	Until 1960s: Ad hoc narrative reviews, the norm
1960s and 1970s: Large number of studies examining similar hypotheses	1970s and 1980s: Statistical methods of research integration gained popularity
1980s and 1990s: Growing eclecticism and diversity of purpose, methods, and perspectives in primary research	From late 1980s: Growing eclecticism and diversity of purpose, methods, and perspectives in research syntheses

do) mutually inform each other. A dialectic tension exists between the methods of primary research and research synthesis, where methodological developments in either mode influence methodological developments in the other mode. Clarifying and rationalizing the concept of a meta-analysis, Glass, McGaw, and Smith (1981) noted that the "styles of research integration have been shaped by the size of the research literature" (p. 20). In our purposeful synthesis of the literature on primary research methods in education and research synthesis methods, we found that the styles of research synthesis have been shaped by both the size and the styles of the relevant primary research literature (Suri, 2007b). In Table 1, we summarize the nature of typical primary research literature, published on a given topic of research, juxtaposed with the methods of research synthesis that became the norm a decade later. In the 1940s and 1950s, primary research on a given topic of interest tended to consist of a relatively small number of primary research studies employing similar methods. These could be aptly described by ad hoc narrative reviews, which were a norm in education until the 1960s. In the 1960s and 1970s, there was a tendency for many individual topics within education to be examined by a large number of primary research studies, which aimed to objectively report their findings on similar hypotheses. In the 1970s and 1980s, statistical methods of integrating findings across studies gained popularity. These methods synthesized studies that addressed similar hypotheses, with objectivity, even if the individual findings varied in magnitudes and directions. By the 1980s and 1990s, primary research in education was marked by a diversity of purposes, perspectives, and methods. With a growing acceptance of qualitative research methods, the elusive nature of objectivity was increasingly being recognized and questioned. A parallel drive for methodological inclusivity can also be observed in the evolution of methods of research synthesis since the late 1980s (Grant & Graue, 1999). "Clarity, explicitness, and openness" (Glass et al., 1981, p. 20) are still valued. However, there is a growing recognition that these tenets may be pursued through a variety of quantitative and/or qualitative methods of sense making. Such diversity of approaches to research synthesis is evident from the variety of formally proposed approaches, as well as from the exemplar syntheses published during the past decade in *RER* and *RRE.* Thus, we notice a time lag of about a decade between primary research methods and their compatible research synthesis methods. Such a lag is understandable given that most syntheses are likely to include primary research conducted during the previous decade.

In our synthesis, we also noted that a decade ago, there was a relative paucity of published literature on the following issues: the synthesis of qualitative research; the qualitative synthesis of quantitative and qualitative research; the involvement of key stakeholders, especially practitioners, in making critical choices throughout the synthesis process; and the reflexivity in research syntheses. In recent years, the landscape of research synthesis methods has rapidly changed to become inclusive. Different aspects of these issues are being addressed by several scholars, as elaborated in the first part of this article. The literature on synthesizing qualitative research is still young, and it can be improved by exploring the adaptability of ideas, techniques, and strategies from qualitative primary research methods to research synthesis processes (Qual–Quan Evidence Synthesis Group, 2004; Shadish, 2006).

We believe that each method described in the previous section has its individual strengths, weaknesses, and domain of applicability. Each method makes useful contributions by providing guidelines for synthesizing a type of research report. However, each method excludes information from other types of research literature and hence has a limited scope. Exploring adaptability of various methodological ideas, techniques, and strategies from primary research methods to research synthesis processes can contribute, and often has contributed, toward improving the craft of research synthesis. A purposeful synthesis of diverse literature on methods of research synthesis and primary research would be useful. The notion of involving key stakeholders in identifying a suitable purpose for the review is becoming widely accepted. A thorough discussion of strategically involving different stakeholders and enacting reflexivity throughout the synthesis process will be useful. Several scholars have directly and indirectly called for greater transparency and reflexivity in research syntheses.

Guiding Principles for a Quality Research Synthesis

We have identified three general guiding principles for a quality research synthesis: informed subjectivity and reflexivity, purposefully informed selective inclusivity, and audience-appropriate transparency. They should be regarded, in every quality research synthesis, as desirable features rather than as essential features or prescriptive rigid standards. Each guiding principle may be enacted in different ways in individual syntheses, and they are all likely to be interpreted in terms of different actions, depending on the decision made within an individual phase of the synthesis.

Informed subjectivity and reflexivity. Every research synthesis method, such as meta-analysis or meta-ethnography, has its domain of applicability. No single method is superior to the rest for addressing all types of synthesis questions. Synthesists must make methodological choices that are coherently aligned with their synthesis purposes. Throughout the synthesis process, the synthesist must evaluate various available options to make informed methodological choices that are best suited for the synthesis purpose. “It is never possible to be fully explicit about how something is done, and trying to proceduralize reviewing could actually make it less rather than more effective in important respects” (Hammersley, 2003, p. 8). Rather than maintain an objective distance from the synthesis process, the synthesist ought to actively take into consideration the varied interests of different stakeholders in the field, including those of oneself.

In practice, a dialectic and dialogic tension exists between both the process and the product of a rigorous synthesis, whereby both mutually inform and shape each other. Certain methodological decisions would provide insights into a phenomenon that may be different from those found through alternative methodological decisions. In a rigorous research synthesis, the synthesist ought to explicitly reflect on the interactive relationship and the dynamic interplay between the synthesis process and the synthesis product (Lather, 1999). Being reflexive requires synthesists to iteratively reflect on how the synthesis process changes their worldviews and how their changing worldviews affect the synthesis product. To make the report more compelling, synthesists ought to be explicit about where they are coming from and how their positioning may influence the synthesis. The synthesist must substantiate why certain paths were followed, and the rest not followed, in a synthesis process. In a credible synthesis, it is crucial to not discount alternative methodological paths without a justified reason. "Reflexivity is a way of enhancing analysts' self-consciousness of what they do and why they do what they do" (Zhao, 1991, p. 385).

Some might argue that informed subjectivity and reflexivity are at odds with the aspirations for disengaged objectivity espoused by some positivists. However, we believe that most educational researchers, regardless of their methodological orientations, advocate some level of reflexivity, even if guised under different names. Even systematic reviewers with a positivist orientation recognize that "it is impossible to abolish conflict of interest, since the only person who does not have some vested interest in a subject is somebody who knows nothing about it" (Campbell Collaboration, 2001, n.p.). All synthesists, including meta-analysts, recognize that a series of judgment calls are inevitable in every synthesis (e.g., Stock, Benito, & Lasa, 1996). As Glass et al. (1981) note, "it is not uniformity in research reviewing and integrating that is desirable, rather it is clarity, explicitness, and openness" (p. 20). Aspiring for objectivity to achieve neutral purposes is not essentially bad; however, a false impression of suggesting a degree of objectivity that is not feasible is objectionable. Even systematic reviewers using a priori protocols could be reflexive to some extent by reflecting on how their a priori protocols focus their gaze, analysis, or synthesis in certain directions while blinding them to other connections. An emphasis on recognizing the situatedness of our reviews is also evident in the current guidelines for submissions to the *RER*, as the editors note: "All reviews are situated in their own frameworks and, for a review to be complete, this framework must be acknowledged and critiqued" (King & Gordon, 2006, n.p.).

Positivist synthesists, like meta-analysts, go out of their way to avoid biases because any bias undermines their claims of objectivity and neutrality. As far as possible, all synthesists must take into account any biases introduced by their methodological and political choices. However, biases on their own are not essentially bad or undesirable in all syntheses. Synthesists from interpretive, participatory, and critical traditions can harness some of these biases to enhance depth, utility, and impact of their syntheses. They can "illuminate the nature of the bias and the social, cultural, and political forces that shaped it" (Moss, 2005, p. 280). Nonetheless, all synthesists must be wary of biases caused by unreflexive selectivity—that is, those biases that have not gone through the synthesist's reflexive scrutiny. These are different from the biases that have been reflexively considered by the synthesist.

Useful criteria for evaluating all syntheses include the following: "(a) quality of the literature reviewed, (b) significance of the topic, (c) potential impact of the review on research and practice, (d) contribution to the field, (e) appropriate length, (f) clarity of expression, and (g) balance and fairness" (Murray & Raths, 1996, p. 417). In general, the understandings constructed in a synthesis may be evaluated by the extent to which they are useful and insightful to the intended audience. There is no universal framework by which the results of all quality syntheses may be evaluated. However, the process by which the synthesis was conducted can be evaluated with respect to its methodological coherence and consistency of alignment, along with its overarching paradigmatic orientation. The product of that process would be acceptably judged in light of the legitimacy of the process, where the product derives its legitimacy from the process rather than from an extended set of criteria outside the process.

For instance, positivist synthesists can aim at enhancing the global quality of their connected understandings in the following ways: construct validity, by "considering competing theories and measures of theoretical constructs"; external validity, by addressing publication bias through extensive literature searches and estimating the extent of potential bias; internal validity, by "creating strata for design types" and estimating associated biases; and statistical conclusion validity, by carefully "noting important sources of potential heterogeneity such as study participants, setting, time periods, and reliability of measures" (Wortman, 1994, pp. 106–108).

An interpretive synthesis may be evaluated by its potential to do the following: stimulate healthy debate rather than achieve closure (Eisenhart, 1998); increase our understanding of a research domain; illuminate implications of contextual, theoretical, and methodological positioning of individual studies on prelavant understandings of a phenomenon; generate or expand theory; and provide a new way of understanding the phenomenon (Beck, 2003). The truth value or credibility of a synthesis may be (a) the extent to which the participants of the relevant primary research are able to resonate with the synthesis findings or (b) the extent to which the authors of the relevant primary research believe that their findings are faithfully represented. External validation of synthesis findings is possible, by comparing them with the related theoretical literature. Internal reliability, consistency, dependability, and auditability may be measured by the extent to which similar conclusions would be made by other synthesists following the reported synthesis process (Jensen & Allen, 1996; Paterson et al., 2001).

Participatory syntheses should "connect the local and the global" by transforming "*both* practitioners' theories and their practices and the theories and practices of others whose perspectives and practices may help to shape the conditions of life and work in particular local settings" (Kemmis & McTaggart, 2000, p. 598, emphasis in original). The value and validity of a participatory synthesis lies in providing "effective support for the stakeholders' actions, organizations, and/or communities in their processes of self-determining social change" (Greenwood & Levin, 2000, p. 94). Participatory syntheses could be evaluated in terms of the degree to which co-synthesists have been "integrated" rather than being "distanced" or merely "related" on the following issues: "motivation for involvement, depth of participation, quality of dialogue, authority for decision making and meaning making" (Shulha & Wilson, 2003, p. 665). "Epistemic participation" could be accomplished through "critical subjectivity" (Heron & Reason, 1997, p. 284), where the relevant research literature

and the synthesis process serve as sites for all co-synthesists to critically reflect on their practices and engage in a process of reciprocal learning about useful strategies for selecting, interpreting, evaluating, distilling, connecting, and reflecting on research that is relevant to their own practices.

Critically oriented synthesists should be conscious of how "reviews contain silences" and "expressions" that privilege some discourses over others, thus becoming "the bearer of truth and power effects." At the same time, such synthesists should be wary that "voice and silence do not operate in antithesis and that appeals to 'voice' on the basis of fixed 'identity' do not 'represent' inclusion, but may in fact reinvoke the terms on which repression is given ground" (Baker, 1999, p. 380). Critical synthesists can "criticize how things are," as well as "articulate a politics of hope" (Denzin, 2000, p. 262). The quality of these syntheses can be determined by the "empathy they generate, the exchange of experience they enable, and the social bonds they mediate" (Jackson, 1998, p. 180). In critically oriented syntheses, "data must be allowed to generate propositions in a dialectical manner that permits use of a priori theoretical frameworks, but which keeps a particular framework from becoming the container into which the data must be poured" (Lather, 1986b, p. 267). Critical syntheses should be "tempered by a sense of openness" by constantly watching "for the interruptive, counter-hegemonic capacity and absent-presence of what James Scott (1990) calls 'hidden transcripts'" (Livingston, 1999, pp. 15–16).

The previous discussion illustrates how the potential efficacy of any research synthesis is subject to situated criteria that reflect the paradigmatic orientation of the synthesis. Notably, one of the reviewers of this article posed the question, "Could not two people reviewing exactly the same pool of research come up with quite different conclusions?" Our response is, yes! Just as two primary researchers might conduct different studies of the same setting, two research synthesists might synthesise the same pool of research using different frameworks to come up with quite different conclusions.

Purposefully informed selective inclusivity. Our methodological orientation inevitably influences how we see other forms of research. For instance, some methodological purists in educational research are not so enthusiastic about methodological pluralism in education. Yet we have focused on the numerous educational researchers who are increasingly opening up to a variety of tools, techniques, and viewpoints on how to collect, analyze, and synthesize their evidence. Through the MIRS framework, we bring to light several issues that tend to be overlooked in a positivist research synthesis, such as a meta-analysis. First, we stress the fundamental question of what counts as legitimate evidence to different stakeholders in educational research. Second, we take into account varied interests of different stakeholders in educational research and practice, which necessitates that we recognize a spectrum of questions and representations that are likely to be of interest to multiple audiences. Third, we problematize issues related to the various levels of representations in a research synthesis. Participants of primary research, authors of primary research studies, the research synthesist, and the target audience of the synthesis should all be seen as stakeholders in a research synthesis. Fourth, we suggest numerous ways in which collaborative involvement of varied stakeholders can enrich a research synthesis.

Inclusivity is an enabling constraint that requires us to recognize and honor differences. Inclusivity can be realized in numerous valid ways. Inclusion is always mirrored by exclusion. Thus, any form of inclusivity can be only partial inclusivity. The inclusivity that we emphasize within the MIRS framework is not an unrestrained and unthinking inclusivity. There is a clear distinction between purposefully informed critical subjectivity and a nihilistic "anything goes" attitude. A commitment to methodological inclusivity heightens the need for critical, informed, purposeful selectivity. An obligation for purposeful selectivity has been the hallmark of research syntheses, even from the very conception of a meta-analysis.

It may sound paradoxical to advocate selectivity in a framework that is fundamentally concerned with inclusivity, but informed selectivity remains as important in a MIRS as it has always been in any rigorous research synthesis. Inclusivity and selectivity are not in simple opposition. Rather, there is an interesting dialectical tension between them. If we broaden the domain of what is brought together, then the process of which clearly becomes more complex. All decisions in a research synthesis must be guided by the principle of purposefully informed selective inclusivity.

Being inclusive of a range of qualitative research methods requires that we become sensitive to a variety of questions: Who is researching? Whose questions are being researched? What are the tools, techniques, and perspectives employed in research? What is the relationship between the researcher and the participants? All these questions necessitate that we recognize overlaps and tensions between the varied interests of multiple stakeholders who are involved in educational research and practice.

Primary research and research synthesis can privilege academic knowledge over practitioners' experiences, tacit knowledge, and wisdom—all of which is a valuable source of knowledge and so must be considered when formulating policy and identifying principles of good practice. Any discussion of knowledge construction about educational practices is incomplete and oppressive if it undermines the rich experiential knowledge of different stakeholders, especially teachers and students, whose practices and experiences are the sites for educational research (Ryan & Hood, 2004; Schwandt, 2005). In addition to recognizing the complementary role of primary research and research syntheses, it is crucial to recognize how these domains of knowledge construction are complemented by the experiential knowledge of multiple stakeholders in educational research, policy, and practice. Research syntheses can strengthen the relationship among educational research, policy, and practice by engaging different stakeholders in reading and constructing succinct representations of primary and secondary research. In every research synthesis, we must pay careful attention to the varied interests of different stakeholders.

Audience-appropriate transparency. Research synthesists from diverse orientations emphasize the need to be explicit about critical decisions (and their justifications) in the process of a research synthesis. Depending on the ontological, epistemological, and methodological underpinnings of a synthesis, the overarching principle of transparency may be justified with different motives. Transparency of process can provide readers "opportunities for inspection, replication, verification, or refutation" (Ogawa & Malen, 1991b, p. 283). Positivist synthesists, such

as meta-analysts, advocate transparency to enhance reliability by improving replicability (e.g., Centre for Reviews and Dissemination, 2006; Oakley, 2003). Most qualitative research synthesists advocate transparency of process to enhance accountability, credibility, and transferability of synthesis findings.

Strathern (2000) contests the innocence of "making the invisible visible" (p. 309) and an implied discourse of distrust and so urges us to attend to that which is concealed by visibility. Many scholars caution against the feasibility and desirability of absolute transparency in any research synthesis (e.g., MacLure, 2005). Each telling is inevitably mirrored by not telling. The metaphor of transparency can wrongly imply that all one needs is a pair of eyes to see through the minds of the synthesists. Rather than advocate prescriptive transparency as some systematic reviewers do, we recommend an audience-appropriate transparency, which the synthesist purposefully enacts. It requires the synthesist to make informed decisions about what aspects of the synthesis process must be explicitly stated to enhance the utility of the synthesis for the intended audience. Such an audience-appropriate transparency has been enacted, not just in some formal methods of research synthesis, but also in several good traditional reviews (Hammersley, 2003).

We believe that research synthesists ought to aspire for enhanced transparency of process with a spirit of communal construction of knowledge rather than with one of defending their integrity. Our insistence on transparency assumes a critical and informed audience rather than a lack of trust. Transparency and reflexivity in the process of a research synthesis allows readers to critically evaluate the similarities or dissimilarities of the synthesis context and the synthesist's standpoint with their own contexts and viewpoints. This can in turn facilitate informed transferability of the product: The audience can adapt the synthesis product, in varying degrees, to their own contexts depending on the relative match with the synthesis context.

Transparency of process can also be difficult when there are restrictions on the length of an article, such as in most paper-based scholarly journals. As such, a synthesist faces the dilemma of what to share within the restriction—that is, to utilize the journal space in a way that is most suited for the intended audience of the journal (Foster & Hammersley, 1998). Constraints imposed by limited journal space may be overcome by archiving details of the synthesis process on the World Wide Web and by directing interested readers to the appropriate Web site (e.g., Mays et al., 2005a, 2005b).

Interactive Phases of a Research Synthesis

Several judgment calls are an inherent part of every quality research synthesis. The product of a research synthesis is inevitably shaped by the decisions made throughout the synthesis process. In developing the MIRS framework, we have synthesized a variety of considerations that are applicable to research syntheses conducted for diverse purposes. These considerations are intended to assist research synthesists in reflecting on, explicitly delineating, and substantiating the critical choices they make in a research synthesis process. These considerations are also intended to assist readers of research syntheses in actively evaluating and adapting the information to their own contexts. These considerations are not absolute requirements for every quality research synthesis. If a synthesist chooses not to attend to a particular consideration, then it ought to be a deliberate, purposeful decision to do so, rather than a simple inadvertent omission.[10]

Within domains of applicability, several methodologists have identified various tasks, decision points, stages, and phases in the process of a research synthesis or primary research study (e.g., Cooper, 1982; Maxwell & Loomis, 2003; Noblit & Hare, 1988). We collated several such representations from diverse perspectives; then, we unpacked them to unravel the associated euphemisms and to problematize embedded metaphors and assumptions. We then purposefully adapted and synthesized them into the following six phases of considerations relevant to any quality research synthesis:

1. drawing from pertinent philosophical and theoretical discussions;
2. identifying an appropriate purpose;
3. searching for relevant evidence;
4. evaluating, interpreting, and distilling evidence;
5. constructing connected understandings; and
6. communicating with an audience.

In the first phase, drawing from pertinent philosophical and theoretical discussions, we emphasize the need to be explicit and reflexive about how our philosophical, theoretical, and political orientations intersect with our synthesis process and product.[11] The overarching orientations of the synthesis ought to be guided by the anticipated utility of the synthesis, the nature of primary research in the field, and the synthesist's methodological expertise. We encourage synthesists to reflect on how varied theoretical positions of the synthesis would influence assumptions about the intended utility and purpose of the synthesis;[12] the synthesist's relationship to the groups represented in primary research studies; the synthesist's relationship to the authors of the primary research studies; the strategies for selecting and evaluating primary research studies; the techniques for interpreting and distilling information from selected primary research studies; and the strategies for constructing connected understandings and sharing them with the intended audience (Suri, 2008). While reflecting on these considerations, the synthesist must speculate on how these individual choices affect the choice of appropriate overarching orientations for the synthesis. There is no best-fit orientation for all research syntheses. Research syntheses with different orientations can serve equally useful, often different, purposes. For instance, positivist syntheses can describe a phenomenon in terms of generalizable laws, facts, or probabilistic relations between behavioral constructs and contextual variables. Interpretive syntheses can improve "communication and understanding across human groups" (Eisenhart, 1998, p. 393) by interpreting and building connections across the subjective experiences of different stakeholders. A participatory synthesis can encourage critical thinking, experiential learning, and sense making of research that is relevant to the local context by involving those whose practices and experiences are being researched (Suri, 2007b). By paying attention to the presence and absence of various issues in the primary research reports, critically oriented synthesists can raise "important questions about how narratives get constructed, what they mean, how they regulate particular forms of moral and social experiences, and how they presuppose and embody particular epistemological and political views of the world" (Aronowitz & Giroux, 1991, pp. 80–81).

In the second phase, identifying an appropriate purpose, we emphasize that the synthesist must identify an appropriate purpose from a range of potentially useful purposes that may or may not involve solving a problem. The synthesist must consider what potential stakes and collaborations would be prioritized in the synthesis; the perceived nature of the substantive area; the intended audience and utility; the pragmatic constraints identified; and the ethical considerations taken into account.

Research synthesists can strategically influence principles, practices, policies, and public opinions. By generating midrange theories and principles that are transferable to several contexts, research synthesists can inform policies and practices. By raising public awareness and politicizing or problematizing certain practices, synthesists can influence policy makers' agendas and influence public perceptions. For example, a meta-analysis with a large collective sample size may demonstrate that a large proportion of dyslexic students do not feel adequately supported in our current school systems. Such a synthesis can communicate to various stakeholders the urgent need to formulate policies that support these students. Interpretive syntheses that provide insights into the general dynamics of various intervention programs for dyslexic students can facilitate informed policy and practice decisions. A deconstructive synthesis may problematize some assumptions underlying various intervention programs that "otherize" dyslexic students. A participatory synthesis may engage groups representing the interests of dyslexic students to identify programs that may be particularly useful for these students.

In the third phase, searching for relevant evidence, we emphasize that the data are not out there ready to be collected. The relevant evidence may be methodologically diverse, and the searches for relevant evidence will inevitably involve some sort of filtering, guided by both the sampling logic and the search strategies employed by the synthesist. The sampling logic may be exhaustive or purposeful. Various considerations within this phase are related to framing an appropriate set of inclusion criteria, strategically utilizing relevant sampling approaches, pursuing suitable search channels, and identifying the rationale for enacting closure. All these decisions must be mutually coherent and in alignment with the synthesis purpose, and they must strategically take into account relevant pragmatic constraints to ensure the feasibility of the synthesis. For instance, exhaustive searches are appropriate to make generalizable claims or to provide a comprehensive picture of research in an area (Bair, 1999; Eastabrooks et al., 1994; Oakley, 2003; Paterson et al., 2001). However, different strategies for "purposeful sampling" (Patton, 2002, p. 230) might be appropriate for interpretive syntheses (Noblit & Hare, 1983).

In the fourth phase, evaluating, interpreting, and distilling evidence, we stress the interpretive nature of any process of evaluating and distilling relevant and trustworthy information from selected reports. Research synthesists must identify appropriate quality criteria for including/excluding individual reports from the synthesis. Synthesists can draw on various published evaluation criteria for different types of positivist research (e.g., Gorard, 2002; Petticrew & Roberts, 2006; What Works Clearinghouse, 2003), interpretive research (e.g., Guba & Lincoln, 1999; Paterson et al., 2001; Popay et al., 1998), participatory research (e.g., Greenwood & Levin, 2000; Heron & Reason, 1997), and openly ideological research (e.g., Lather, 1986a, 1993; Lincoln & Guba, 1986). We contest the notion that the data are out there, lying in the primary research reports, from which the synthesist can objectively

make sense. Rather, we assert that it is through the synthesist's interpretations that the evidence reported in the primary research reports comes to life for the purpose of the synthesis. Different connected understandings would be constructed depending on what aspects of the research reports are being focused on; how that information is being encoded, summarized, or distilled; and how missing information and biases associated with specific findings are being treated. In alignment with the purpose and overarching orientation of the synthesis, a synthesist may enhance rigor in evaluating, interpreting, and distilling evidence from individual studies in various ways, such as by striving for objectivity, neutrality, and consistency; being reflexive; and collaborating to enhance trustworthiness (Suri, 2007b).

In the fifth phase, constructing connected understandings, multiple understandings may be constructed by connecting information from individual primary research studies. The connected understandings constructed in a synthesis may be variable oriented, study oriented, and inductive/deductive. Tools and techniques for conceptualizing and expressing connections across individual reports include the following: content analysis (e.g., Engberg, 2004; Kasworm, 1990); statistical techniques (Cooper & Hedges, 1994a); interpretive techniques (Bair, 1999; Noblit & Hare, 1988; Ogawa & Malen, 1991b); historical methods (Donato & Lazerson, 2000); visual displays (Pope et al., 2007); "narrative juxtaposition" (Dixon-Woods, Agarwal, Jones, et al., 2005, p. 47) and writing as a "method of inquiry" (Richardson, 2001, p. 35); multiple frames of reference (e.g., Windschitl, 2002); techniques informed by critical sensibilities, such as genealogy (Franklin, 1999) and deconstructivism (Baker, 1999; Lather, 1993; Livingston, 1999); arts-based methods (Norris, 2003); and various bibliography, meta-analysis, and qualitative data analysis software (e.g., Paterson et al., 2001). Drafts and redrafts of coding schemes, narratives, matrices, and concept maps can help in organizing and leaving a trail of the synthesist's emerging thinking. Strategies that research synthesists can employ to enhance plausibility, authenticity, utility, robustness, and validity of their findings include reflexivity (Lather, 1999), collaborative sense making (e.g., Wideen, Mayer-Smith, & Moon, 1998), eliciting feedback from key stakeholders (Ogawa & Malen, 1991b), identifying disconfirming cases and exploring rival connections (Dunkin, 1996), sensitivity analyses (e.g., Sirin, 2005), and using multiple lenses (Peshkin, 2001).

In the sixth phase, communicating with an audience, it is essential that the synthesist respond to the needs of the intended audience, as well as the potential impact that the synthesis may have on various stakeholders. Typically, the content of a synthesis must include introductory information to contextualize the synthesis; justification of critical methodological decisions that could influence the synthesis product; delineation and substantiation of the synthesist's construction of the connected understandings across studies, as well as conflicts and boundaries associated with the claims made within the synthesis; and implications, recommendations, and discussion of those claims for the intended audience. Given that educational reviews are often regarded as representing wider power relations, synthesists should be conscious of a "review's authorizing or legitimating function" and so attempt to ethically address the issues of "voice, identity, and representation" (Baker, 1999, p. 365) in a synthesis. To reach diverse audiences effectively, synthesists can strategically choose from a range of media, including paper-based publishing, digital publishing, formal presentations, and interactive presentations.

Stylistic genres that are appropriate to communicate the relevant messages and match the preferences of their target audiences could include scientific-reporting format, with four distinct sections (i.e., Introduction, Methods, Results, Discussion; Cooper, 1982); coherent thematic narratives (e.g., Bransford & Schwartz, 1999; Engberg, 2004); and stories, allegories, drama, documentary films, poetry, music, and art (Noblit & Hare, 1988). For each idea, theme, or finding, synthesists should identify pertinent quantitative, visual, narrative, or artistic techniques for a rich, succinct, and audience-friendly representation.

In referring to each phase, we have deliberately used clauses beginning with action verbs in preference to nouns. This is to emphasize a dynamic approach to research synthesis that values the process as well as the product. The verbs associated with each phase (drawing; identifying; searching; evaluating, interpreting, and distilling; constructing; and communicating) are offered in present continuous tense to stress the tentative and ongoing nature of each phase and to refrain from implying a sense of finality. Furthermore, we have refrained from connoting a sense of objective distancing within each phase, by emphasizing the role of the synthesist as a sensitive human instrument. Through the MIRS framework, we have attempted to construct spaces for discussing how some abstract concepts may be applied to the practice of research synthesis. Any synthesis is inevitably influenced by the synthesist's prejudices. Our selection or omission of particular considerations has also been guided by what we believe are important issues in a research synthesis.

We have used the term *phases* in lieu of *stages* because the latter suggests discrete boundaries, in that each stage serially follows the previous one. In practice, phases are likely to overlap, with tasks involved in more than one phase being carried out simultaneously. Considerations within each phase may inform and refine the process of other phases. Various tasks within different phases may be sometimes carried out simultaneously. Such flexibility leaves scope for an inductive design, as opposed to the requirement that every synthesis have an a priori deductive design.[13]

Figure 1 illustrates the interactive nature of the six phases of our conception of the MIRS framework. We have used double-arrowed lines between consecutive phases to stress that decisions within an individual phase are likely to inform (and be informed by) decisions within adjacent phases. In accordance with the principle of purposefully informed selective inclusivity, each phase is connected by a double-arrowed line with the phase of identifying an appropriate purpose. This phase is positioned in the center to highlight that decisions about the purpose of a synthesis act as critical filters for decisions within different phases, and vice versa. The sequential nature of these phases is preferably conceptualized as an interactively iterative process where each phase tends to be revisited and refined several times rather than be linear, spiral, or cyclical.

Considerations within an individual phase mutually inform choices based on considerations within the other phases. We recognize a sense of artificiality about identifying different phases. Nonetheless, tasks within different phases involve different intellectual activities, although many activities from more than one phase are mutually informing and tend to be carried out in tandem. Decisions within each phase are best conceptualized as components of an interactive network where each decision must be considered in the light of the others. The relative emphasis given to various decisions will be guided by the context of the synthesis. Not all the

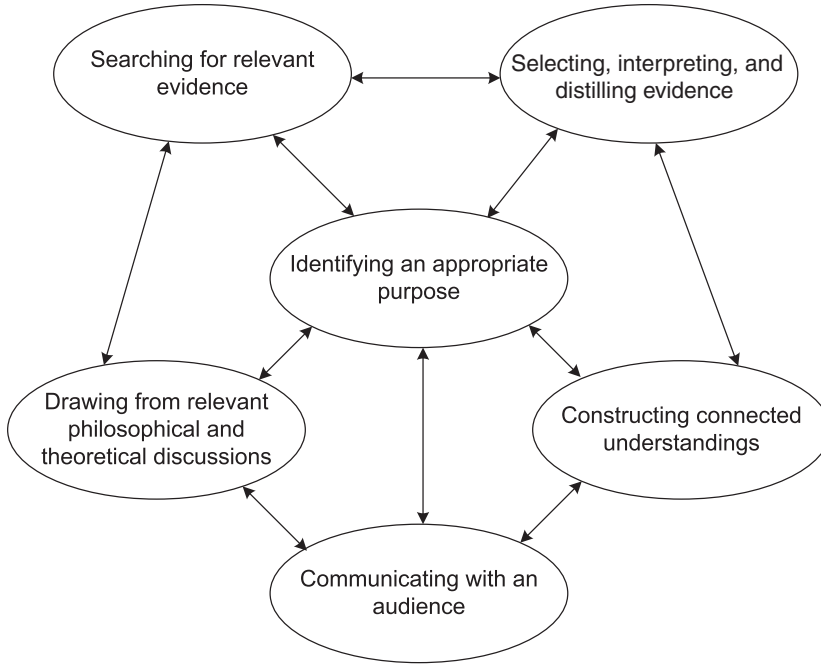

FIGURE 1. *Interactive phases of a research synthesis.*

issues discussed within each phase will be equally relevant to all forms of synthesis. Although some considerations are essential in every synthesis, the rest will apply to some situations but not all.

Point of Departure

Contesting the hegemony of meta-analytic methods within the literature on research synthesis methods, we have constructed a methodologically inclusive discussion of advancements in research synthesis methods. We have thematically organized the literature on research synthesis methods, with a deliberate attempt to highlight possibilities enabled by drawing from interpretive, participatory, and critical perspectives. Embedded euphemisms and taken-for-granted practices within the contemporary methods of quantitative and qualitative research synthesis have been interrogated to expand possibilities within research syntheses. The creative recognition of the situatedness of each synthesis is a key message of this article, applying also to the synthesis reported here.

We have described the salient features of the MIRS framework, which has been conceptualized to facilitate critical and informed decision making among the producers and users of research synthesis (Suri, 2007b). The framework is a purposeful synthesis of ideas, strategies, and techniques from diverse segments of literature on research synthesis methods and primary research methods. Complementary

roles of primary research studies and research syntheses are discussed. Also outlined are the changing trends within the literature on research synthesis methods.

The following three guiding principles have been proposed for every quality research synthesis: informed subjectivity and reflexivity, purposefully informed selective inclusivity, and audience-appropriate transparency. Rather than prescribe how a research synthesis should be conducted or evaluated, we have attempted to open spaces, raise questions, and explore possibilities by identifying clusters of critical considerations within the following six phases of a research synthesis: drawing from pertinent philosophical and theoretical discussions; identifying an appropriate purpose; searching for relevant evidence; evaluating, interpreting, and distilling evidence; constructing connected understandings; and communicating with an audience. It is our hope that this article might be used as a resource bank of references or, perhaps, a point of departure by educational researchers who are engaging in synthesizing research.

We hope that this article will stimulate debate and discussion about numerous aspects of research syntheses from a methodologically inclusive perspective. As the methods of primary research and research synthesis evolve, so will the nature of methodological decisions taken in a research synthesis process. Such changes will have consequences for the MIRS framework. It is crucial that producers and users of research syntheses engage in a meaningful dialogue to establish a better understanding of the capacity and complexity of methodologically inclusive research syntheses. An ongoing dialogue with potential users of research syntheses can help research synthesists more effectively anticipate subsequent interpretation and use of their syntheses. Engaging end users and funding agencies in such discussions can sensitize them to the range of purposes for which syntheses can be conducted. Such discussions can also assist readers of research syntheses in making more informed interpretations and adaptations of the synthesis findings to their own contexts.

There is no best-fit model of research synthesis for all purposes. Rather than limit the nature of questions asked within a synthesis by the limitations of the existing methods, synthesists can explore the adaptation of diverse theories, techniques, and strategies as these are applied in primary research methods for use in the process of a research synthesis. We hope that this article will contribute to the continued evolution of methods of research synthesis and to their purposeful application and informed use.

Notes

This article is based on the doctoral dissertation of the first author, titled *Expanding Possibilities Within Research Syntheses: A Methodologically Inclusive Research Synthesis (MIRS) Framework*, with the second author as her principal supervisor. This project was supported by the following three scholarships, received by the first author from the University of Melbourne: the Melbourne International Research Scholarship, the Melbourne Research Scholarship, and the Department of Science and Mathematics Studentship. The first author wishes to thank Dr. Gaell Hildebrand for her co-supervision in this project. Earlier drafts of different parts of this article were presented at the annual or biennial meetings of the following associations: American Educational Research Association (April 1999, April 2002), Advances in Qualitative Methods (May 2003), Association for Qualitative Research (July 1999, July 2001), Australian

Association for Research in Education (December 1998, November–December 1999), and Higher Education Research and Development Society of Australasia (July 2007).

1. Although some meta-analysts reserve the term *meta-analysis* "to refer specifically to statistical analysis in research synthesis and not to the entire enterprise of research synthesis" (Cooper & Hedges, 1994b, pp. 4–5), this distinction is not recognized by all meta-analysts (e.g., Glass, 2006; Glass, McGaw, & Smith, 1981; Lipsey & Wilson, 2001; Schulze, 2004). In this article, we use the term *meta-analysis* broadly, to refer to the entire process of a research synthesis employing meta-analytic procedures. For example, we use the term *meta-analysts* to collectively refer to meta-analysts and best-evidence synthesists when referring to the perspective on which both the groups converge.

2. This need is being recognized even among some circles of meta-analysts (e.g., Dochy, 2006; Lipsey & Wilson, 2001; Petticrew & Roberts, 2006; Shadish, 2006).

3. There is yet a third, truly minority, group of systematic reviewers, and they are pushing the boundaries of systematic reviews by challenging all of the aforementioned features of systematic reviews. As such, they are methodologically closer to the procedures described in our Synthesizing Qualitative Research section (e.g., Booth, 2001). Just as we are trying to extend the boundaries of what constitutes a rigorous research synthesis, they are doing the important work of extending the boundaries of the term *systematic review*.

4. The term *meta-ethnography* deceptively gives the impression of being exclusively applicable to the synthesis of ethnographic studies (Noblit & Hare, 1988). *Meta-analysis* is a term commonly used to refer to a specific technique of quantitative integration of empirical findings. *Meta-synthesis* literally means "a synthesis of syntheses," and it is used by meta-analysts for a meta-analysis of several meta-analyses (Sipe & Curlette, 1997). *Aggregated analysis* refers to only a particular type of synthesis of qualitative research (Eastabrooks, Field, & Morse, 1994). We have used the term *qualitative research synthesis* to broadly refer to all interpretive efforts of synthesizing qualitative research.

5. We have not described quantitative methods of synthesizing qualitative research, such as case survey method (Yin, Bingham, & Heald, 1972), because most contemporary qualitative research synthesists stress that any synthesis of qualitative research should essentially be qualitative and interpretive (for quantitative methods of synthesizing qualitative research, see Dixon-Woods, Agarwal, Young, Jones, & Sutton, 2005).

6. A recent noteworthy contribution in this area has been made by Pope, Mays, and Popay (2007), who reviewed different methods of synthesizing health evidence. However, their discussion focuses on health evidence and does not take into account research that is openly ideological, arts based, and/or informed by critical sensibilities, all of which is becoming common in education.

7. The methodologically inclusive research synthesis framework in its entirety is presented in an unpublished report by Suri (2007b).

8. When several people start applying a new set of assumptions that are shared to such an extent that they almost become standard assumptions, a new paradigm is developed (Kuhn, 1970). "A paradigm determines the criteria according to which one selects and defines problems for inquiry and how one approaches them theoretically and methodologically" (Husen, 1999, p. 31). One may argue that the field of research synthesis has evolved into a new paradigm for knowledge construction. This paradigm is shared by synthesists who have proposed, conducted, and critiqued various forms of research synthesis. Alternatively, as Noblit and Hare (1988) assert, the concept of research synthesis is "an elaboration of existing understandings about data analysis" (p. 15), rather

than a paradigm shift. Regardless of whether we accept the notion of research synthesis as a paradigmatic shift or not, several assumptions are common to all rigorous methods of research synthesis.

9. Many research synthesists are not methodologically inclusive in recognizing different modes of knowledge construction. For instance, many meta-analysts do not take into consideration qualitative research in their definition of the terms *primary research*, *secondary research*, and *research synthesis* (e.g., Cooper & Hedges, 1994b; Glass, 1976). Within the MIRS framework, we emphasize that the evidence, methodological perspectives, and techniques employed in each of the three modes of knowledge construction can be qualitative, quantitative, or a combination of both. In this article, we refer to *primary research* as an umbrella term for *primary research* and *secondary research* to distinguish them from *research syntheses*.

10. We avoid the phrase "decision points" (Light, 1980, p. 13) because it suggests a single right decision taken at a single instant of time. In practice, the process of a synthesis is complex, and decisions are often influenced by several considerations. Each decision tends to be revisited and revised iteratively, in response to the emerging understanding constructed by the synthesist about various aspects of the synthesis topic and the synthesis process (Noblit & Hare, 1988).

11. Several primary researchers have made a similar point within the context of primary research (e.g., Gaskell, 1988; Gee, 2005; Howe, 2005).

12. Several primary researchers emphasize that the research orientation ought to be guided by the question at hand (e.g., Bogdan & Biklen, 1998; Creswell, 2002; Guba & Lincoln, 1999; Yates, 1997). This is also applicable to a research synthesis.

13. The nonsequential and overlapping nature of different phases is emphasized in several formally proposed methods of research synthesis, especially, those designed for synthesizing qualitative research (e.g., Mays, Pope, & Popay, 2005b; Noblit & Hare, 1988; Paterson, Thorne, Canam, & Jillings, 2001).

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