



## Toward an Operational Definition of Evidence-Based Practices

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### INTRODUCTION

The term *evidence-based practice* is now used widely in medicine (Sackett, Richardson, Rosenberg, & Haynes, 1997), occupational therapy (Law & Baum, 1998), speech and language pathology (Reilly, Perry, Douglas, & Oates, 2001), mental health (Geddes, Reynolds, Streiner, & Szatmari, 1997), nursing (Melnik, Fineout-Overholt, Stone, & Ackerman, 2000), social services (Gabbrill, 1999), education (National Research Council, 2002), early childhood intervention (Wilcox, 2001), and other fields (e.g., Freeman, 2001; Masarsky & Todres-Masarsky, 2001; Simnett, Perkins, & Wright, 1999) to describe the adoption of interventions and practices that are informed by research. Contemporary interest in practices that are informed by research can be traced to Archie Cochrane's (1972) observation about the lack of evidence for health care, and his contention that "it is surely a great criticism of our profession that we have not organized a critical summary, by specialty or subspecialty, adapted periodically, of all relevant randomized controlled trials" (Cochrane, 1979, p. 1). The Cochrane Collaboration (Chalmers, 1993), founded in 1992, is dedicated to carrying out Dr. Cochrane's call for "preparing, maintaining and ensuring the accessibility of systematic reviews of the effects of health care interventions" (Cochrane Collaboration, 1999, p. 3).

To say that there was burgeoning interest in evidence-based practices at the end of the 20th century and the beginning of the 21st century is an understatement. There are now more than 100 centers dedicated to reviews and syntheses of research evidence that inform various kinds of practice (Cutspec, 2002). An Internet search using the phrases *evidence based practice* or *research based practice* yielded more than 38,000 hits!

The rapid growth in synthesizing research evidence, however, appears to have neither lessened nor bridged the research-to-practice gap (Bero et al., 1998). We believe this is the case for three reasons. First, a review of the published literature finds no explicit operational definition of evidence-based practices. Without an operational definition, there is likely to be little or no focus on increasing understanding of how research evidence needs to be scrutinized and culled in order to inform

practice (Brandtstädter, 1980). Second, there has been an uncritical acceptance of certain research methodologies as being superior to others. Different research methodologies establish the functional relationship between variables in different ways. Objectivity and credibility, and not research designs per se, are what matter the most in terms of establishing a functional relationship between variables (see e.g., Bickman, 2000; National Research Council, 2002). Third, research syntheses continue to be prepared mostly for researchers and not for practitioners. Practitioners, for the most part, find these syntheses to be of little use in informing their day-to-day practice (e.g., Cranney, Warren, Barton, Gardner, & Walley, 2001; Gervais, Poirier, Van Iterson, Egan, & Tickle-Degnen, 2002; Prescott et al., 1997). A practice-centered research synthesis should inform a practitioner about what he or she can do differently the next time he or she interacts with a child (or parent, family, patient, etc.) to improve functioning or achieve a specific outcome.

The purpose of this paper is to propose an operational definition of evidence-based practices that can be applied to a wide range of research designs and the syntheses of both quantitative and qualitative data, in which multiple kinds of methods and evidence both within and across studies can be used to draw conclusions about the relationships between variables. The definition differs from descriptions currently found in the literature by its focus on the operationalization of the relationship between a practice and its effect, and the processes that function or operate to produce observed changes (Babbie, 1995; Cook & Campbell, 1979). The definition also is practically meaningful in the sense that emphasis is placed on the ability to "create testable, dependable, and planned changes,

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[where] the most meaningful causes are those which can be deliberately manipulated” (Cook & Campbell, 1979, p. 36).

The development of our operational definition was completed as an activity of the Research and Training Center on Early Childhood Development ([www.researchtopractice.info](http://www.researchtopractice.info)). The major goal of the Center is to implement a coordinated and advanced program of applied research with a focus on research syntheses of studies that directly inform improvements in child functioning. Therefore, most of our examples come from early childhood intervention and child development research, although our approach to evidence-based practices is applicable to any kind of intervention or practice in any applied field of investigation.

## CURRENT STATE OF AFFAIRS

Current perspectives on evidence-based practices have been influenced by Sackett et al.’s (1997) definition of evidence-based practice (e.g., Australian Centre for Evidence Based Practice in Speech Pathology, 2000; Christiansen & Lou, 2001; Law, 2000; Tickle-Degnen, 1999) and various attempts to develop hierarchies of evidence for determining the credibility of research findings (e.g., Holm, 2000; Law, 2000; Moore, McQuay, & Gray, 1995).

### *Evidence-Based Practice*

According to Sackett, et al. (1997), “evidence-based practice is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients” (p. 2). This definition tells us “how” evidence-based information is used to inform practice, but it is not an operational definition. An operational definition consists of the operation or operations that specify the processes or manner in which terms, constructs, or variables are related (Babbie, 1995). An evidence-based operational definition, for example, would include the articulated relationship between practices that are informed by research and the resulting changes in behavior or outcomes that would be expected as a result of the practices (Woodworth & Schlosberg, 1954). The Sackett et al. definition falls short in this regard.

### *Levels of Evidence*

There have been various attempts to “rank the value” of different research designs and methodologies in order to ascertain the strength and believability of evidence. For example, Moore et al. (1995) proposed a five-level model of evidence, in which randomized controlled trials are considered the gold standard, and other research methodologies are considered of lesser value in establishing the effectiveness of a particular kind of intervention or practice. (See Law, 2000, for a more inclusive levels-of-evidence organizing scheme). The a priori adoption of randomized trials as a best source of evidence for informing practice is misguided for a number of reasons. First, proponents of evidence-based practices have pointed out that different kinds of efficacy questions demand the use of different kinds of research methodologies (e.g., National

Research Council, 2002; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; Yin, 1994). Second, randomized trials do not directly inform practice because they fare poorly in terms of identifying the processes or mechanisms that operate to produce observed effects. This is the case because: (1) interventions are most often tested at a molar (i.e., treatment vs. nontreatment) rather than micro level (Cook & Campbell, 1979), (2) treatment fidelity measures are often not obtained, nor are variations in degree of interventions experienced, in relation to variations in outcomes, and (3) these designs “purport to control an infinite number of ‘rival hypotheses’ *without specifying what any of them are*” (Campbell, 1994, p. x). Third, other research methodologies, including, but not limited to, single case designs (Barlow & Hersen, 1984) and case study designs (Yin, 1994), often do a much better job of establishing the manner in which intervention processes operate to produce observed outcomes, yet they are not explicitly mentioned as appropriate methodologies (e.g., Moore et al., 1995).

Research designs and methodologies that help identify the practice characteristics and processes that operate to influence variations and changes in behavioral outcomes are most desired for identifying evidence-based practices. This is the case because “evidence supporting molar [cause-effect relationship] will usually be probabilistic; it is probably the case that the more molar the causal assertion and the longer and more unspecified the assumed micromediation chain, the more fallible the causal [assumption] and the more probabilistic its supporting evidence” (Cook & Campbell, 1979, p. 33).

## A FUNCTIONAL APPROACH TO EVIDENCE-BASED PRACTICES

The definition of evidence-based practices proposed here attempts to maintain a focus on scientific rigor, while at the same time producing information that directly informs practice that is based on the best research evidence available. The definition is embedded in a framework that places emphasis on the *characteristics* and *consequences* of environmental events, experiences, and opportunities, the *functional relationship* between the characteristics and consequences, and the *processes* that operate to explain the relationship between an intervention and its benefits. Figure 1 shows the nature of these relationships graphically. Our definition and framework are grounded in the behavioral and social sciences (e.g., Babbie, 1995; Bronfenbrenner, 1992; Cook & Campbell, 1979; Sidman, 1960), in which there is explicit concern for the scientific understanding of the relationship between the characteristics

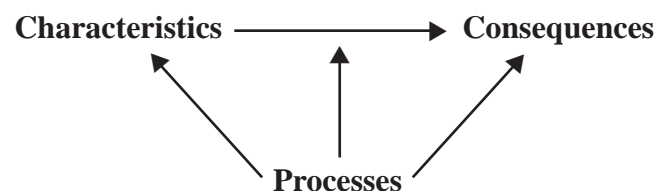


Figure 1. Framework for depicting the relationships between the characteristics and consequences of an intervention or practice and the processes operating to explain the relationship between the variables.

of an (environmental) intervention and the consequences of one or more practices.

### ***Proposed Definition of Evidence-Based Practices***

Any intervention can be conceptualized as an environmental event, experience, opportunity, variable, etc. that is expected to influence or be related to a specified behavior or an outcome in a predictable manner (Bronfenbrenner, 1992; Horowitz, 1994). Stated differently, an environmental variable of known or specifiable characteristics may be thought of as an intervention that, when implemented or manipulated, produces or is related to changes or observed differences in either behavioral functioning or an outcome.

Intervention processes of any kind have characteristics or features that can be measured and related to variations in the consequences or outcomes of the intervention. The extent to which the same (or similar) intervention characteristics are related to the same (or similar) consequences when the relationship is empirically established (and is scientifically defensible) is what makes the intervention evidence-based. Using this functional relationship as a foundation, evidence-based practices can be defined as:

*Practices that are informed by research, in which the characteristics and consequences of environmental variables are empirically established and the relationship directly informs what a practitioner can do to produce a desired outcome.*

This definition has a two-pronged emphasis. On the one hand, it demands attention to the empirical relationship between the characteristics and consequences of a practice or intervention. On the other hand, it demands that the ways in which these relationships are established directly inform how a practitioner puts evidence-based practices into effect. The latter is what differentiates our definition from most other approaches used to establish evidence-based practices.

The measurement of the characteristics of an intervention or practice has variously been called treatment fidelity (Halle, 1998; LeLaurin & Wolery, 1992), intervention fidelity (Dumas, Lynch, Laughlin, Smith, & Prinz, 2001), treatment adherence (Hogue, Liddle, & Rowe, 1996), implementation fidelity (McGrew, Bond, Dietzen, & Salyers, 1994), treatment integrity (Armstrong, Ehrhardt, Cool, & Poling, 1997), and program integrity (Dane & Schneider, 1998), among others. The consequences of a treatment, intervention or practice have typically been described in terms of their outcomes, benefits or effects (e.g., Guralnick, 1993; Marfo & Dinero, 1991). The manner in which the characteristics of a practice or intervention are operationalized and measured (Babbie, 1995), and related to variations in outcomes, matters a great deal if a research study is to produce believable findings and directly inform practice.

### ***Relationship Between Characteristics and Consequences***

The measurement of, and the relationship between, the characteristics and consequences of an intervention and practice can be established in a number of ways, and can produce different levels or degrees of empirical credibility. There are

six ways in which practice characteristics or consequences can be measured, and related or not related to one another, when establishing a relationship between variables.

1. The consequences of a practice or intervention are measured to establish a change in a behavior or outcome.
2. The characteristics of a practice or intervention are measured to establish that the environmental event or experience was applied.
3. Both the characteristics and consequences of an intervention or practice are measured, but are not related to one another, in a way that establishes a statistical or functional relationship between the two variables.
4. Both the characteristics and consequences of an intervention or practice are measured and related to one another in a way that establishes a statistical or functional relationship between variables.
5. Both the characteristics and consequences of an intervention or practice are measured and related to one another empirically, and alternative explanations for the relationship are systematically ruled out.
6. The relationship between the characteristics and consequences of an intervention or practice is replicated across cases or studies, empirical dependencies are established, and alternative explanations for the relationship are ruled out.

These six types of relationships between the characteristics and consequences of an intervention or practice constitute a hierarchy, in which the credibility of the evidence becomes increasingly stronger when the highest conditions in the hierarchy are met.

Our framework constitutes an alternative to those in which different research methodologies are pitted against one another, and puts different qualitative and quantitative research designs on an equal footing. We contend that multiple sources of evidence from studies using different research methodologies and designs can produce converging evidence about effective practices to the extent that the same relationship between variables is demonstrated in different ways. The credibility of findings is determined not by research designs per se, but by the extent to which empirical relationships are established in ways that are scientifically defensible (Campbell & Stanley, 1963; Cook & Campbell, 1979; Yin, 2000) and that directly inform practice. Examples of the ways in which this can be accomplished at each level in our framework are described by Dunst (2002).

### ***Processes and Mechanisms***

The manner in which practice characteristics influence one or more outcomes (consequences) elucidates the nature of the relationship between variables. According to the National Research Council (2002),

Finding that a causal agent (x) leads to an outcome (y) is not sufficient. Important questions remain about *how* x causes y. Questions about how things work demand attention to the processes and mechanisms by which the causes produce their effects. (p. 117)

Specifying the processes and mechanisms that explain the

relationship between variables is what leads to a *clearer understanding* of how an intervention, X, influences an outcome, Y. In instances where processes or mechanisms can be identified, or reasonable explanations or hypotheses are defensible (Yin, 2000), the resulting understanding is more likely to directly inform practice.<sup>1</sup>

The manner in which sufficiently high certainty can be claimed about the processes that operate to explain a relationship between variables is illustrated with research on parent/child interactions and parenting styles. More than 40 years of parenting and parent/child relationship research (see Shonkoff & Phillips, 2000) has found that sensitive, nurturing, responsive, and supportive parenting styles are associated with better child outcomes compared to more directive, intrusive, and controlling parenting styles. Close examination of this research indicates that interactive episodes between a child and his or her parent provide a context for the child to learn about his or her capacities to produce predictable responses (Goldberg, 1977; Lamb, 1981) and the behavioral propensities of others (Lamb, 1981), both of which operate to strengthen a child's sense of cognitive-social competence. Research indicates that interactions that are mutually reinforcing are associated with positive consequences, whereas those that are characterized by unpredictability or inconsistencies are associated with negative consequences. Experimental research that promotes adoption of either responsive or directive parenting styles has produced evidence indicating that increased use of responsive styles enhances child competence, and that increased use of directive styles attenuates competence (e.g., Riksen-Walraven, 1978). These findings, coupled with results from similar kinds of investigations, bolster the contention that responsive styles operate to influence child behavior and development by means of both a child's emerging understanding of the contingency between his or her behavior and its consequences, and a parent's emerging understanding of how interactional styles influence child behavior (see especially Bronfenbrenner, 1995; Wachs, 2000).

Processes that operate to produce or influence behavior or development vary on a continuum from those that are proximal to those that are distal. "*Proximal environmental influences* are specific social, physical, or symbolic contextual characteristics that directly impinge on" behavior or development (Wachs, 2000, p. 125). The above example of how responsive parenting styles operate to produce child competence is an example of a proximal environmental process. *Distal environmental influences* are the societal, cultural, economic, social network, institutional, and other macrosystem variables (Bronfenbrenner, 1979) that indirectly influence behavior or development through mediating or moderating influences. An example of a distal environmental process is research summarized by Cochran (1993), which illustrates the ways in which different features of personal

social networks and social support operate to produce variations in parenting beliefs, attitudes, behaviors, and styles.

### **Rival Explanations**

The extent to which one can reasonably attribute the relationship between two variables to an explanatory process or mechanism is strengthened by the ability to systematically rule out rival or competing explanations for the covariation between variables (Campbell & Stanley, 1963; Cook & Campbell, 1979; Yin, 1994, 2000). The ability to rule out competing explanations establishes the *internal validity* of a study or studies. Detailed reviews of validity threats are beyond the scope of this brief report. (See Cook & Campbell, 1979, and Yin, 2000, for detailed descriptions.) Two points are worth making, however, in the context of our operational definition of evidence-based practices. First, explicit attention needs to be paid to rival explanations and threats to internal validity when synthesizing practice-based research evidence to ensure that statements about functional relationships or cause-effect inferences are justifiable. Second, it needs to be remembered that the "core of the scientific method is not experimentation per se but the strategy connoted by the phrase plausible rival hypotheses" (Campbell, 1994, p. ix) and the ability to rule out competing explanations for observed effects (Yin, 2000).

Three types or classes of rival explanations pose threats to conclusions about the functional relationship between the characteristics and consequences of an intervention or practice. The first are methodological threats to the internal validity of a study (Campbell & Stanley, 1963; Cook & Campbell, 1979). Cook and Campbell (1979), for example, list 13 threats to *internal validity* that constitute plausible alternative explanations for observed or measured effects in a study. The second are *real-life* "alternative explanations for the observed phenomenon or result" (Yin, 2000, p. 248). Yin (2000) proposes a typology of six real-life rival explanations that need to be ruled out before the scientific credibility of a study is established. The third are threats to the theory about the mechanisms that explain a relationship between variables (National Research Council, 2002; Yin, 2000). The hypothesized theory must be more plausible than other theories before a proposition is considered to be the most reasonable among competing explanations. The development and testing of "rival theoretical propositions" (Yin, 1994, p. 108) therefore must be an integral part of ruling out competing explanations. To the extent appropriate, attention to all three types or classes of rival explanations needs to be part of an evidence-based research synthesis.

### **EXAMPLES OF EVIDENCE-BASED PRACTICES**

Three brief examples are provided to illustrate the manner in which evidence-based practices are established using our definition and approach to identifying practices that are informed by research. The research literature and methodologies are deliberately diverse to show the general utility of our evidence-based definition and approach to synthesizing research findings.

<sup>1</sup> There are instances, however, in which a functional relationship among variables can be empirically established, but the mechanisms that explain why a practice "works" are not easily understood (e.g., Werts, Wolery, Holcombe, & Gast, 1995; Wolery, Kirk, & Gast, 1985). This kind of problem-driven research does not demand an understanding of mechanisms in order for research to inform practice, and represents an alternative to explanatory research (National Research Council, 2002).

## ***Infant Operant Learning***

The first example is from infant operant learning research, which indicates that child behavior that produces reinforcing consequences increases production of the behavior (e.g., Fagen, 1993; Gewirtz & Peláez-Nogueras, 1992; Lipsitt, 1970). Many of these studies have used some type of single-case experimental design (Barlow & Hersen, 1984) to investigate the conditionability of infant behavior, while others have used more naturalistic observation and recording strategies to investigate response-contingent infant learning capacities (e.g., Feldman, Greenbaum, Mayes, & Erlich, 1997; Goldberg, 1977; Lamb, 1981).

For illustrative purposes, let us assume that the baseline measurement in a study is the number of infant leg kicks emitted over a 20-minute period. Let us further assume that subsequent introduction of a contingency (leg kicks now produce movement of a mobile by means of a Velcro ankle band) increases the production of leg kicks. Further assume that a return to baseline results in a decrease in leg kicks. Assume that the same pattern of response is replicated with 20 or 30 infants, and that the same or nearly identical results are obtained in 10 or 15 studies.

In this example, both the characteristics and consequences of the practice are measured. The characteristics are the presence or absence of a contingency that is easily established. The consequences are the predicted patterns of leg kicks (low during the baseline and return to baseline conditions, and high during the “intervention” phase of the study). The relationship between the characteristics and consequences is established by intentionally changing the contingency and measuring the effect. The fact that the same response pattern is observed for many different infants, and that the same results are reported by different investigators or replicated by the same investigators, bolsters the conclusion that the response-contingent learning opportunity promoted child production of the operant behavior. The credibility of the findings becomes even stronger when one considers the fact that the same contingency relationships between child behavior and its consequences have been found in both experimental and nonexperimental studies (see especially Tarabulsy, Tessier, & Kappas, 1996). The implication for evidence-based practice is simple and straightforward: *Child production of behavior is increased when behavior results in an interesting or reinforcing consequence.*

## ***Family-Centered Helpgiving***

The second example is from research investigating the characteristics and consequences of different family-oriented approaches to helpgiving (Dunst, Johanson, Trivette, & Hamby, 1991; Trivette & Dunst, 1998). Case studies of parents involved in different kinds of helpgiving programs were conducted to obtain evidence that established the extent to which there was a relationship between specific kinds of practices and the differential outcomes of these practices (Dunst, Trivette, Davis, & Cornwell, 1988; Dunst, Trivette, Davis, & Cornwell, 1994; Dunst, Trivette, Gordon, & Starnes, 1993; Dunst, Trivette,

Starnes, Hamby, & Gordon, 1993; Trivette & Dunst, 1995). “Case studies are a preferred strategy when ‘how’ and ‘why’ questions are being posed, when the investigator has little or no control over events, and when the focus is on a contemporary phenomenon within some real-life context” (Yin, 1994, p. 1). In these kinds of investigations, maintaining a chain of evidence and replicating this relationship (Yin, 1994, pp. 98-99), while at the same time ruling out rival explanations (Yin, 2000), increases the credibility of explanatory influences.

The case study protocols used to collect process and outcome data included two types of questions: those designed to elicit descriptions of practices that were consistent with the premises of family-centered practices, which were expected to be associated with positive consequences (experimental hypothesis); and those designed to elicit descriptions of nonfamily-centered practices, which were expected to be associated with negative consequences (alternative hypothesis). Case study participants were carefully selected so they varied in background characteristics, life circumstances, and other variables that might account for any obtained results. On an a priori basis, we hypothesized that regardless of these factors, family-centered and nonfamily-centered practices would operate in dissimilar fashions, bolstering the contention that how help is provided matters most in terms of its consequences. This strategy essentially constituted the replication of findings across cases, where differences in background characteristics could be systematically eliminated as factors that explained any obtained relationships.

Findings from the case studies, replicated across families and across investigations, produced results demonstrating that family-centered practices were associated with positive outcomes and nonfamily-centered practices were associated with either negative or neutral outcomes. For example, practices characterized by family choice, and action based on the family’s choice, were associated with parental efficacy appraisals that attributed observed changes and effects to the family itself. Alternatively, the lack of choice and the provision of help by practitioners without family participation resulted in parent efficacy appraisals that attributed changes to practitioners and not to the family. The fact that the same relationships are found in studies using different methodologies and different measures of both the characteristics and consequences of family-centered practices bolsters the contention that active participation in making choices and acting on these choices is what contributes to a sense of control and empowerment (e.g., Dempsey & Dunst, 2002; Judge, 1997; Thompson et al., 1997; Trivette, Dunst, & Hamby, 1996a, 1996b). The implications of this particular finding for evidence-based practice are simple and straightforward: *Provide families with choices, and opportunities to act on their choices, to increase the self-efficacy benefits of practitioner helpgiving.*

## ***Parent Well-Being***

The third example is from research demonstrating a relationship between different aspects of parent well-being and parenting styles and interaction patterns (Dunst & Trivette,

1988). More specifically, research indicates that the presence of positive parent and family health and well-being is correlated with a greater display of responsive parenting behavior and a minimal display of coercive and directive interactional styles. Moreover, the correlation between health and well-being and parenting behavior is manifested after the effects of other variables have been statistically controlled. The pattern of findings in these studies suggests that the presence of enhanced well-being sets the occasion for increased parent sensitivity to child behavior and the increased likelihood that the parent will respond contingently to that behavior (Goldberg, 1977).

The extent to which the relationship between parent and family functioning and parenting behavior is a functional relationship is established by the following line of reasoning. According to Cohen and Cohen (1983), “the old [adage] that ‘correlation does not mean causation’...is grossly misleading [because] causation manifests itself in correlation” (p. 15). Indeed, a necessary condition for a functional, cause-effect relationship to exist between variables is that variations on one measure co-vary with variations on another measure (Cook & Campbell, 1979). The extent to which the covariation is not spurious or artifactual is determined by: (1) establishing the time precedence between variables (for X to cause Y, X must precede Y in real time), (2) ascertaining a functional or statistical relationship between two variables (e.g., by statistical methods), and (3) ruling out the possibility that the relationship between X and Y is not due to one or more variables that causes both X and Y, such that controlling those variables eliminates covariation between X and Y (Kenny, 1979). In the studies conducted by Dunst and Trivette (1988), the well-being measures were obtained prior to observations of parent/child interactions, the relationship between measures was found to co-vary in an expected manner, and the possible influences of other variables were ruled out (statistically) as factors contributing to the observed effects. Findings from more recent research investigating the influences of well-being on parenting styles (e.g., Dunst, 1999; NICHD Early Child Care Research Network, 1999) using quite different research methodologies bolsters the contention that the presence of positive well-being improves and contributes to parent sensitivity and responsiveness. In these investigations, the three conditions that Kenney (1979) contends are necessary for making cause-effect statements were met, and the patterns of findings produced evidence indicating the importance of well-being as a contributor to parenting styles. The implication of this finding for evidence-based practice is: *Bolster parental well-being as a factor that influences parent sensitivity and responsiveness to child behavior.*

#### **MAKING RESEARCH-TO-PRACTICE EVIDENCE USER-FRIENDLY**

Synthesizing research evidence with a focus on the implications for practice is only a first step in bridging the research-to-practice gap. A second step is translating evidence into practices that are easily understood and used. As indicated earlier, evidence-based research reports are being produced at

a rate that far outpaces their use for informing or guiding practice (e.g., Bero et al., 1998; Lomas, 1991; Oxman, Thomson, Davis, & Haynes, 1995). The reasons this occurs are multiple and complex, and a detailed analysis is beyond the scope of this paper (see Cutspec, 2002, for a review and analysis). Two reasons, however, are worth mentioning briefly because they help explain the research-to-practice gap. The first is that most research syntheses are written for researchers and not practitioners, and pay cursory attention to the direct implication for practice (e.g., what a practitioner can do to use evidence-based practices). The second reason is that practitioners generally do not read these research reports, and when they do, find them minimally useful (e.g., Gervais et al., 2002).

Efforts to integrate early childhood research to develop or inform research-based practices can be found in traditional research reviews and meta-analyses (e.g., Dunst, Snyder, & Mankinen, 1988; Shonkoff & Hauser-Cram, 1987; White & Casto, 1985), recommended and clinical practice guidelines (e.g., Field & Lohr, 1992; Interdisciplinary Council on Developmental and Learning Disorders, 2000; McLean & Odom, 1996; Sandall, McLean, & Smith, 2000), and books devoted to research-based early childhood intervention practices (e.g., Bailey & Wolery, 1984; Barnett, Bell, & Carey, 1999; Dunst, 1981; Guralnick, 1997; Shonkoff & Meisels, 2000). Lessons learned from those various efforts informed our evolving approach to what we have come to call *Practice-Centered Research Syntheses* ([www.researchtopractice.info](http://www.researchtopractice.info)). A practice-centered research synthesis involves systematic analysis and integration of small bodies of research that have investigated the same or similar practices and the same or similar outcomes with an explicit eye on the characteristics of the practices that are related to desired effects and therefore should be the focus of what practitioners and parents “do” to produce positive benefits.

*Practice-Centered Research Syntheses* are prepared in ways in which research evidence is used to inform practice in a user-friendly manner. Research syntheses that support the use of a practice or intervention are prepared in a newspaper article format called *Bottomlines*. *Bottomlines* describe the practice that constitutes the focus of analysis and inform the reader about the extent to which available research evidence supports the practice. *Bottomlines* are written specifically for practitioners and parents.

Both research syntheses and *Bottomlines* are used to help develop *Practice Guides* for implementing evidence-based practices. *Practice Guides* are user-friendly brochures, newsletters, videos, audiotapes, and/or narratives in which the relationships between characteristics and outcomes are clearly explained. These guides may be as simple as a few principles or a series of steps that can be followed to implement a practice, or as detailed as a description of multiple phases of an intervention that can be used to achieve an effect that is similar to that explicated in a research synthesis.

Findings from the research syntheses describe the characteristics of the practices that can be expected to produce specific consequences (outcomes or benefits), and *Bottomlines* apprise potential users of the benefits that can be realized from the

use of *Practice Guides*. Social validation of both the research syntheses and *Bottomlines*, and research on the effectiveness of *Practice Guides*, constitute a focus of investigative effort by our research team (see [www.researchtopractice.info](http://www.researchtopractice.info)).

## SUMMARY

The purpose of this paper was to propose an operational definition of evidence-based practices and to illustrate the key elements of a practice-centered approach to research syntheses. The definition of and approach to evidence-based practice simultaneously attends to the scientific rigor and the usefulness of the findings for specifying the practice characteristics that are associated with positive benefits and outcomes. A particular approach to bridging the research-to-practice gap was briefly described, and constitutes the focus of our efforts to develop and evaluate the usefulness of practice guides. Both our definition of evidence-based practice and our approach to translating research into usable practice guides are expected to be systematically refined as field tests are completed.

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