

Identifying Evidence-Based Early Childhood Intervention Practices: What Counts as Evidence, Types of Studies, and Contributions of Research Syntheses

Carl J. Dunst, Ph.D.
Senior Research Scientist
Orelena Hawks Puckett Institute
Asheville and Morganton, North Carolina

Presentation prepared for a seminar for “Preparing Tomorrow’s Leaders for High Need Infants and Children and Their Families” Leadership Training Program, University of Connecticut Health Center, Farmington, CT, December 8, 2014.

Purpose of the Seminar

- Describe the purposes of different types of studies in early childhood intervention and other fields
- Describe a framework for categorizing different types of research syntheses for identifying evidence-based early childhood intervention practices
- Describe a practice-based approach to conducting research syntheses to identify which practice characteristics matter most in terms of positive intervention outcomes

What Counts As Evidence?

- This depends on the purpose of a study or a research synthesis and the question that is being asked. This can include either or both quantitative and qualitative data, observed or latent measures, etc.
- No *a priori* assumptions are made about the type of research design that is considered the “gold standard.” Different research designs are like different tools: You pick the right tool for the right job.
- Some measure of the size of effect between variables of interest, either in a single study or in a research synthesis, is the type of information needed to establish an evidential relationship.

Types of Research Studies^a

- Efficacy Studies
- Effectiveness Studies
- Efficiency Studies

^a Marley, J. (2000). Editorial: Efficacy, effectiveness, efficiency. *Australian Prescriber*, 23, 114-115.

Definition of Terms

Efficacy is the extent to which an (intervention) has the ability to bring about its intended effect under ideal conditions such as a randomized clinical trial (Marley, 2000, p. 114).

Effectiveness is the extent to which a treatment is effective if it works in real life in non-ideal circumstances (Marley, 2000, p. 114).

Efficiency is the extent to which an intervention is worth its cost to individuals or society (Marley, 2000, p. 115).

Types of Research Studies in Early Childhood Intervention

- Group Design Studies
- Single Subject Studies
- Correlational Studies
- Case Studies

Group Design Studies

Group design studies are typically described as experimental, quasi-experimental, or pre-experimental investigations. These include, but are not limited to:

- Intervention vs. Nonintervention Studies
- Intervention A vs. Intervention B Studies
- Pretest vs. Posttest Studies

Single Subject Design Studies

Single subject or single participant design studies involve ongoing data collection of behavior under pre-intervention conditions (baseline) to behavior after interventions are introduced to establish the effectiveness of the interventions

- Baseline, Intervention, Return to Baseline (ABA) Studies
- Multiple Baseline Design Across Children Studies
- Multiple Baseline Design Across Behavior Studies
- Multiple Baseline Design Across Setting Studies

Correlational Studies

Correlational studies involve analyses of the relationships between variations in intervention variables with variations in outcome variables to establish the nature of the relationships among variables

- Covariation Among Variable Studies
- Multiple Regression Analysis Studies
- Structural Equation Modeling Studies

Case Studies

Case studies involve collection of information about intervention processes and outcomes associated with different processes to establish the effects or influences of the interventions

- Descriptive Studies
- Exploratory Studies
- Explanatory Studies

Research Syntheses of Intervention Studies

A research synthesis includes “methods for summarizing, integrating, and where possible, culminating the findings of different studies on a topic or research question” (Davies, 2000, p. 367)

Types of Research Syntheses

- Narrative Reviews
- Summative Reviews
- Systematic Reviews
- Meta-Analyses

Narrative Reviews

- Narrative, or traditional literature reviews, attempt to identify what has been written on a subject or topic, using which methodologies, on what samples or populations, and what findings
- Narrative reviews typically include descriptive summaries of the results from primary studies and interpretive statements about the nature of the relationships between an intervention practice and outcome variables of interest

Summative Reviews

- Summative reviews are similar to narrative reviews but include some type(s) of quantification, often in terms of the number of studies according to types of intervention, settings, research designs, study participants, or some other relevant intervention or study feature

Systematic Reviews

- Systematic reviews are research syntheses in which there is a comprehensive search for relevant studies on a specific topic, and those identified are then appraised and synthesized according to a predetermined explicit method
- These types of research syntheses use a systematic approach for determining the types of studies to be included in a review, the search strategy to identify relevant studies, the methods to appraise the quality of identified studies, the methods for analyzing results, and the methods for establishing intervention effects

Meta-Analyses

- A meta-analysis is a particular type of systematic review where effect sizes are used for assessing the relationship between a practice and outcome, where the combined effect size results from a series of studies are used to estimate the average effect of a practice
- Research syntheses that use meta-analytic methods rely on the statistical analysis of study results as the basis for synthesizing and interpreting findings from studies of the same or similar practices
- An effect size is a measure of the strength of the relationship between two variables expressed in terms of a quantitative metric

Framework for Categorizing Research Syntheses

TYPE OF RESEARCH SYNTHESSES

Meta-Analyses				
Systematic Reviews				
Summative Reviews				
Narrative Reviews				
	Group	Single Subject	Correlational	Case Study

TYPE OF STUDY

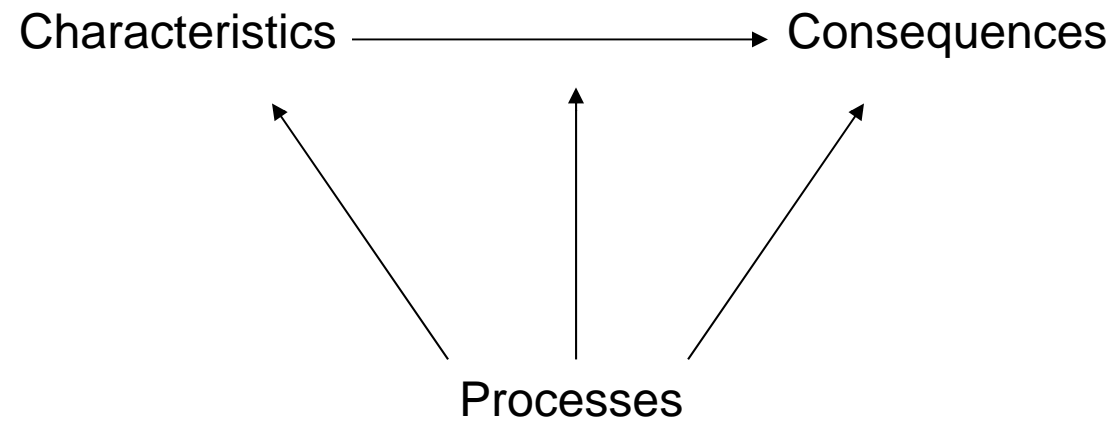
A Practice-Based Approach to Conducting Research Syntheses

- Practice-based syntheses focus on ***unpacking, disentangling, and unbundling*** an intervention to isolate those practice characteristics that “matter most” in terms of explaining the results found in different studies of the same or similar interventions.
- Practice-based research syntheses can be used to examine any one of four types of studies (group, single subject, correlational, case) and be synthesized using any of the four types of research syntheses (narrative, summative, systematic, meta-analysis)

An Applied Definition of Evidence-Based Practices

Evidence-based practices are defined as practices informed by research findings demonstrating a statistical or functional relationship between the characteristics and consequences of a planned or naturally occurring experience or opportunity where the nature of the relationship directly informs what a practitioner or parent can do to produce a desired outcome.

Framework for Evaluating the Relationship Between the Characteristics and Consequences of an Intervention Practice



Examples of Practice-Based Research Syntheses

Effects of Adult Verbal and Vocal Contingent Responsiveness on Increases in Infant Vocalizations^a

Carl J. Dunst

Ellen Gorman

Deborah W. Hamby

Number of Studies: 22 studies including 214 infants and toddlers (15 studies of typically developing infants and 6 studies of infants and toddlers with disabilities)

Research Designs: Baseline (A) and experimental (B), ABA, and ABAB single participant or group design studies

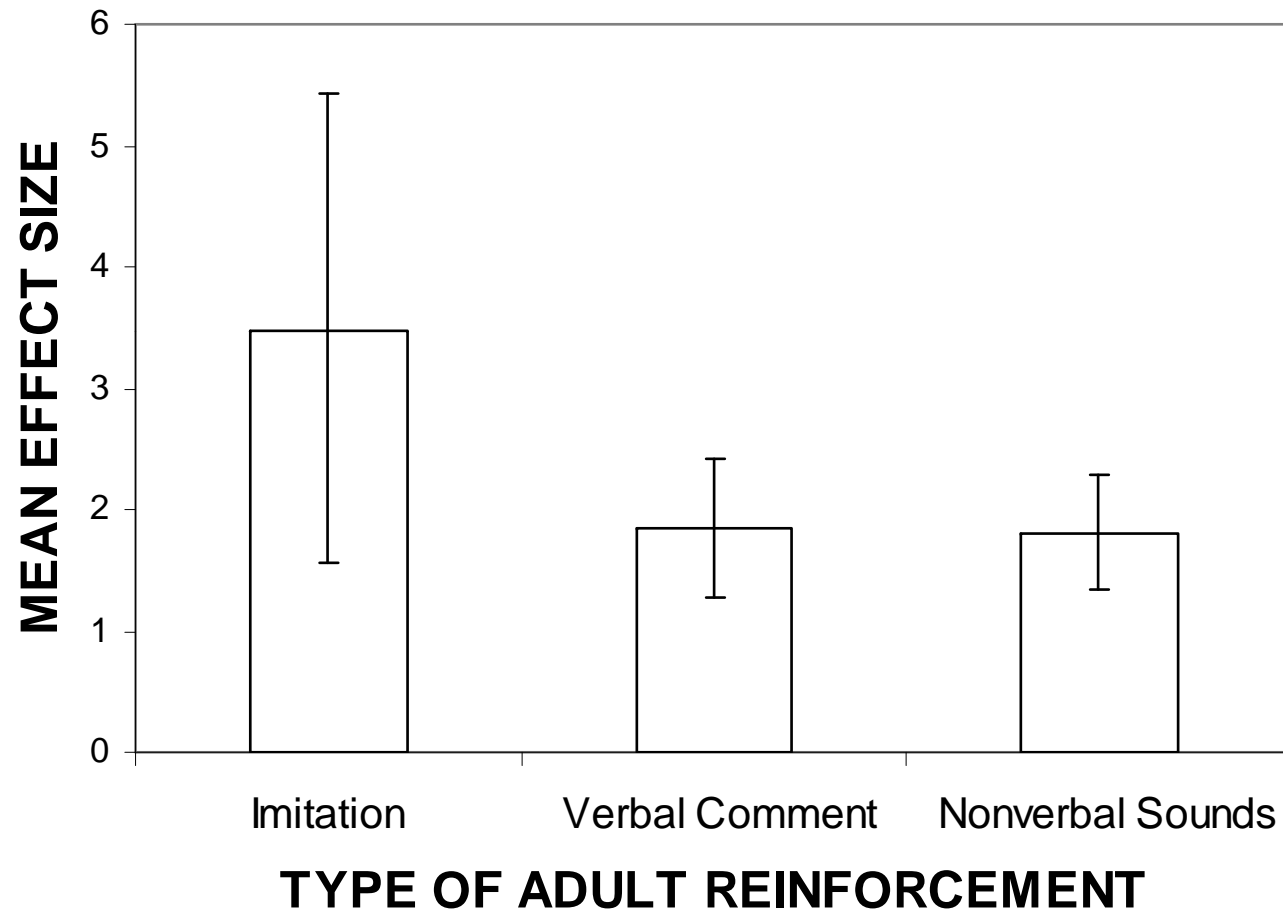
Adult Reinforcement: Imitation of child vocalizations, verbal comments (e.g., “good girl”) or pre-determined vocal sounds (“tsk,tsk, tsk”)

Social Concomitants: Influences of visual, social, and tactile adult concomitant behavior on infant vocalizations

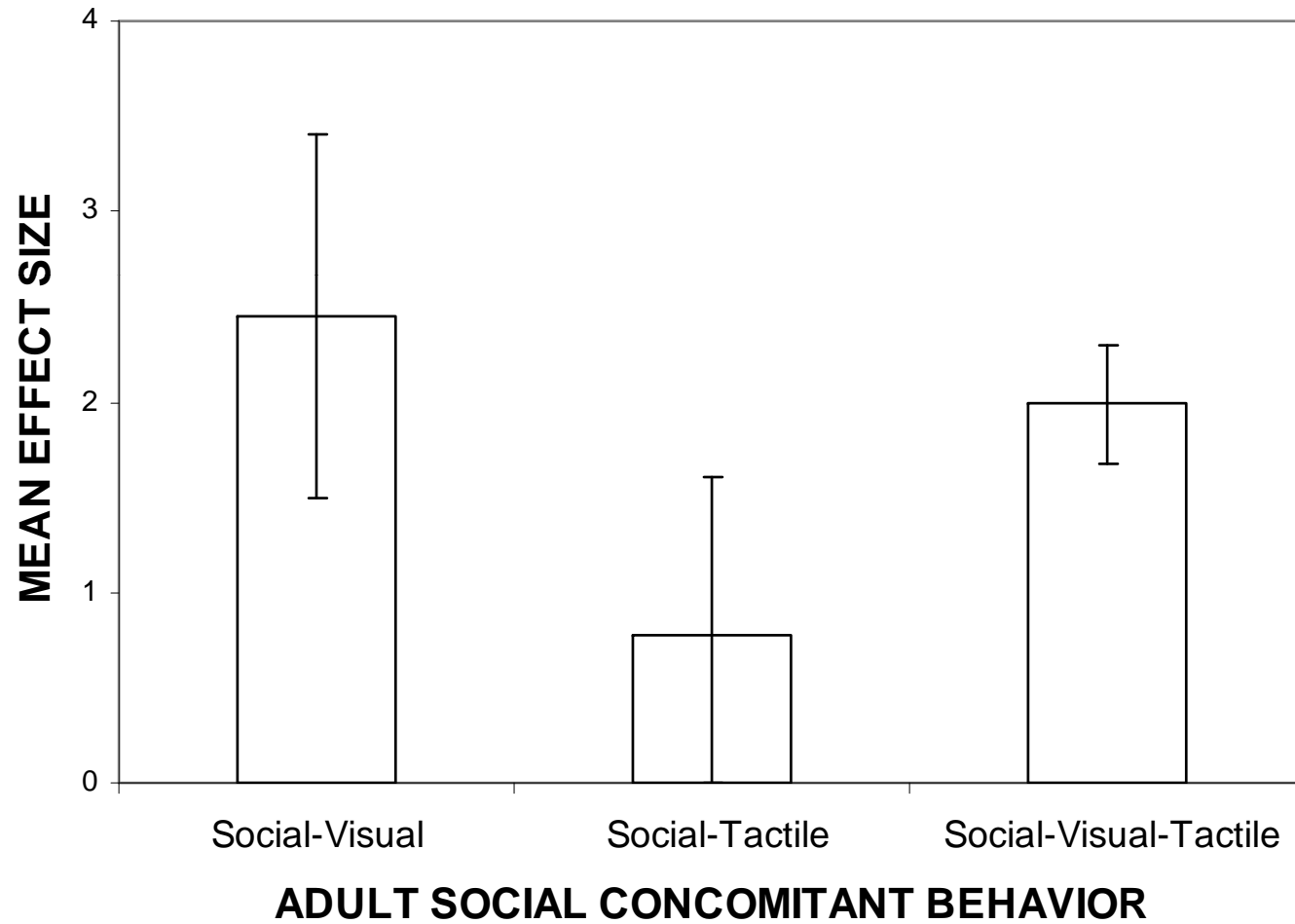
Size of Effect: Cohen’s *d* effect size for the difference between the baseline vs. experimental study conditions

^a *CELLreviews*, 2010, Vol. 3, No. 1 (Available at www.earlyliteracylearning.org)

Relative Effectiveness of Three Types of Adult Reinforcement on Infant Vocalizations



Effects of Adult Social Concomitant Behavior on Infant Vocalizations



Caregiver Sensitivity, Contingent Social Responsiveness, and Secure Infant Attachment^a

Carl J. Dunst

Danielle Kassow

Number of Studies: 75 studies including more than 4500 parent-child dyads

Research Design: Observational studies of parent-child interactions that included measures of child attachment (mostly the Stranger Situation)

Caregiver Sensitivity: Explicit and implicit measures of caregiver contingent social responsiveness and sensitivity

Size of Effect: Cohen's *d* effect size for the relationship between caregiver behavior and secure infant attachment

^a *Journal of Early and Intensive Behaviour Intervention*, 2008, 5(1), 40-56.

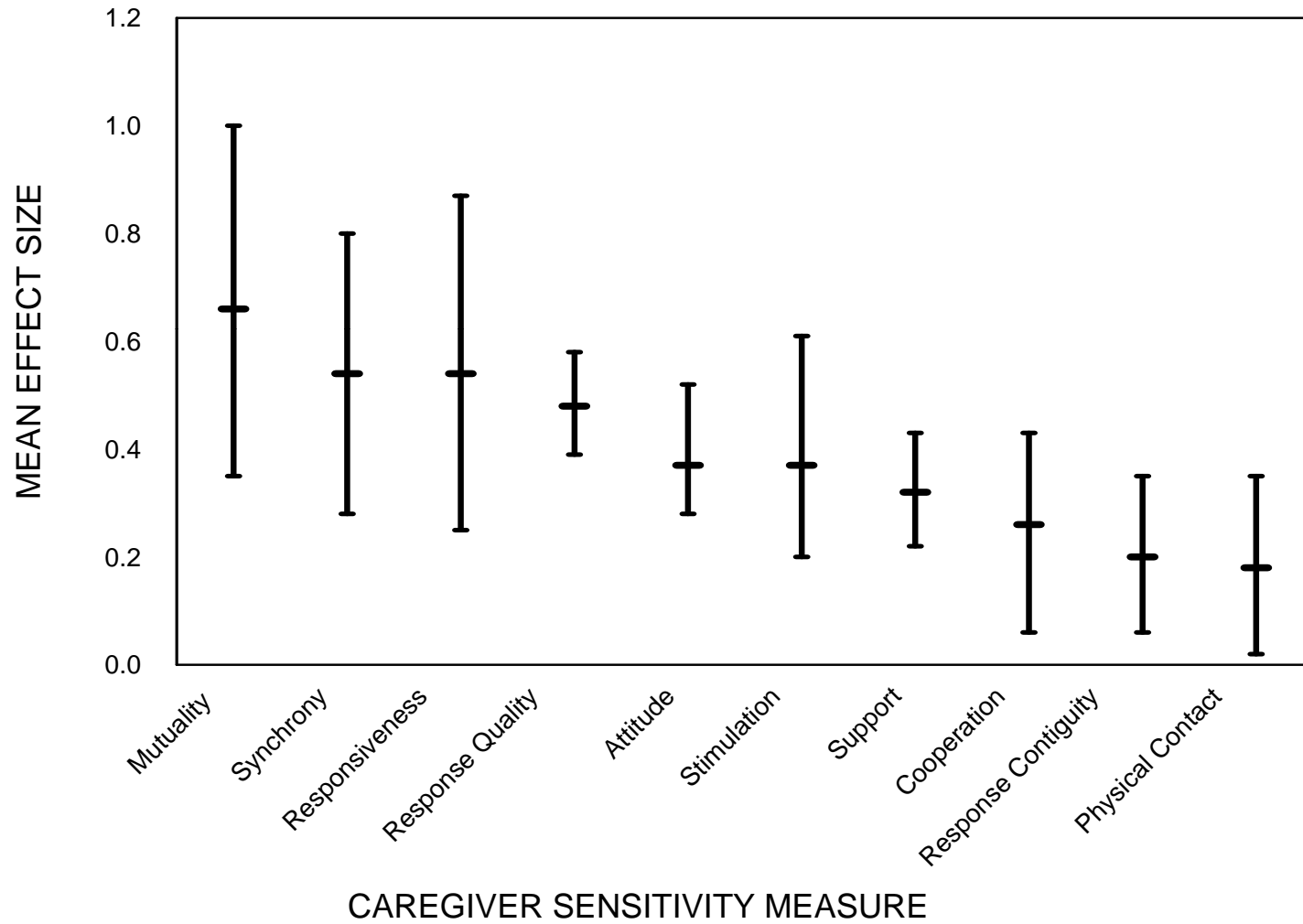
Explicit Measures of Caregiver Sensitivity Behavior

Caregiver Sensitivity Behavior	Definition
Caregiver/Child Synchrony	Synchrony is characterized by caregiver-child interactions that are reciprocal and rewarding to both the caregiver and child (Isabella, Belsky, and von Eye, 1989).
Caregiver/Child Mutuality	Mutuality is characterized by positive caregiver-infant interactions where both the caregiver and child are attending to the same thing simultaneously.
Response Quality	Caregiver response quality is characterized by a caregiver's ability to perceive infant signals accurately, interpret signals accurately, and respond to signals promptly and appropriately (Ainsworth, Bell, & Strayton, 1974; Ainsworth, Blehar, Waters & Wall, 1978).
Responsiveness	Caregiver responsiveness is characterized by a caregiver's response to the infant's behavior where the response functions as a reinforcement maintaining or sustaining infant behavior directed toward the adult (Gewirtz, 1991).
Response Contiguity	Caregiver response contiguity is characterized by a caregiver's promptness and frequency or rate of response to the infant's signals (DeWolf & van Ijzendoorn, 1997).

Implicit Measures of Caregiver Sensitivity Behavior

Caregiver Sensitivity Behavior	Definition
Physical Contact	Caregiver physical contact is characterized by a caregiver's quality and quantity of physical contact with the infant (DeWolf & van Ijzendoorn, 1997).
Cooperation	Caregiver cooperation is characterized by a caregiver's presence or absence of intrusive or interfering behaviors toward the infant whether the caregiver respects the infant's autonomy, if the caregiver avoids interrupting the infant's activities or demonstrates skill when interruption is necessary, and/or does not exert direct control over the infant (Ainsworth et al., 1974).
Support	Caregiver support is characterized by caregiver attentiveness and availability, supportiveness of the infant's efforts, providing a secure base for the infant, and being involved with the infant by attending to both the infant and the task at which both parties are engaged (Matas et al., 1978).
Positive Attitude	Caregiver positive attitude is characterized by the caregiver's expression of positive affect, warmth, empathy, and affection toward the infant (Zaslow, Rabinovich, Suwalsky, & Klein, 1988).
Stimulation	Caregiver stimulation is characterized by any caregiver action toward the infant (Miyake, Chen, & Campos, 1985). Stimulation typically includes caregiver encouragement, affective-stimulation, and stimulation/arousal of the infant.

Mean Cohen's *d* Effect Sizes and 95% Confidence Intervals for the Relationship Between the 10 Caregiver Sensitivity Measures and Secure Infant Attachment



Practices for Increasing Referrals from Primary Care Physicians^a

Carl J. Dunst

Ellen Gorman

Number of Studies: 42 studies of more than 10,000 primary care physicians

Research Designs: Randomized controlled trials and time-series or before and after controlled designs

Types of Interventions: Information campaigns, referral guidelines, feedback to physicians, outreach to physicians, organizational interventions

Size of Effect: Percent difference in the referral rates of the experimental vs. comparison groups or baseline vs. experimental conditions

^a Cornerstones, 2006, Vol. 2, No. 5. (Available at www.tracecenter.info.)

Types of Interventions

Information campaigns included distribution of educational materials (e.g., brochures) or videos to promote referrals to secondary care specialists

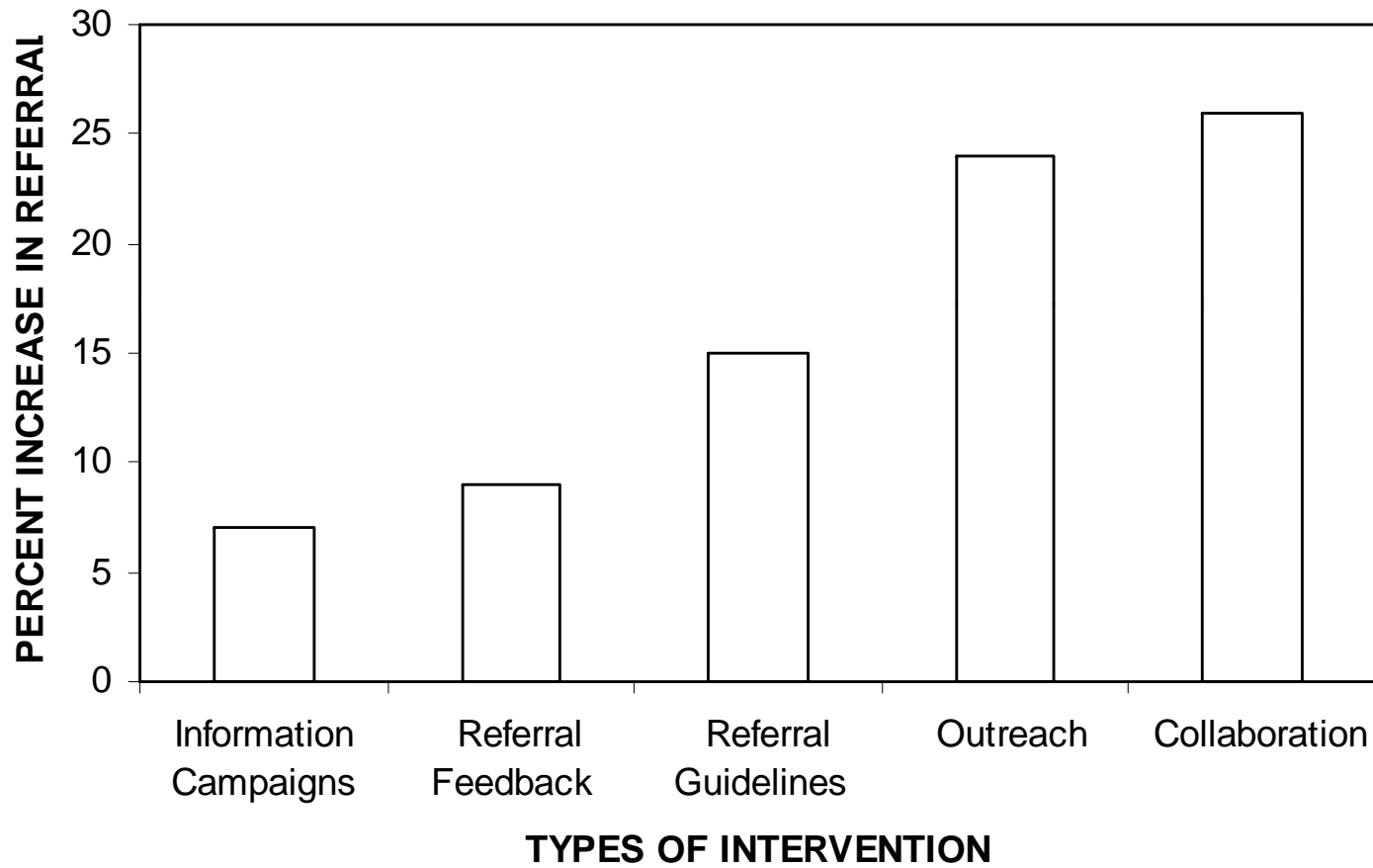
Referral or practice guidelines included descriptions of procedures for making referrals to secondary care specialists

Feedback to physicians included feedback on referral rates and feedback on the use of referral feedback forms

Outreach to physicians included specialist or consultant visits to primary care physicians to affect referrals

Organizational interventions included the provision of speciality care in the primary care settings or the attachment of a specialist to a general practice

Effectiveness of the Five Types of Interventions



Public Awareness and Child Find Activities in Part C Early Intervention Programs^a

Carl J. Dunst

Patricia W. Clow

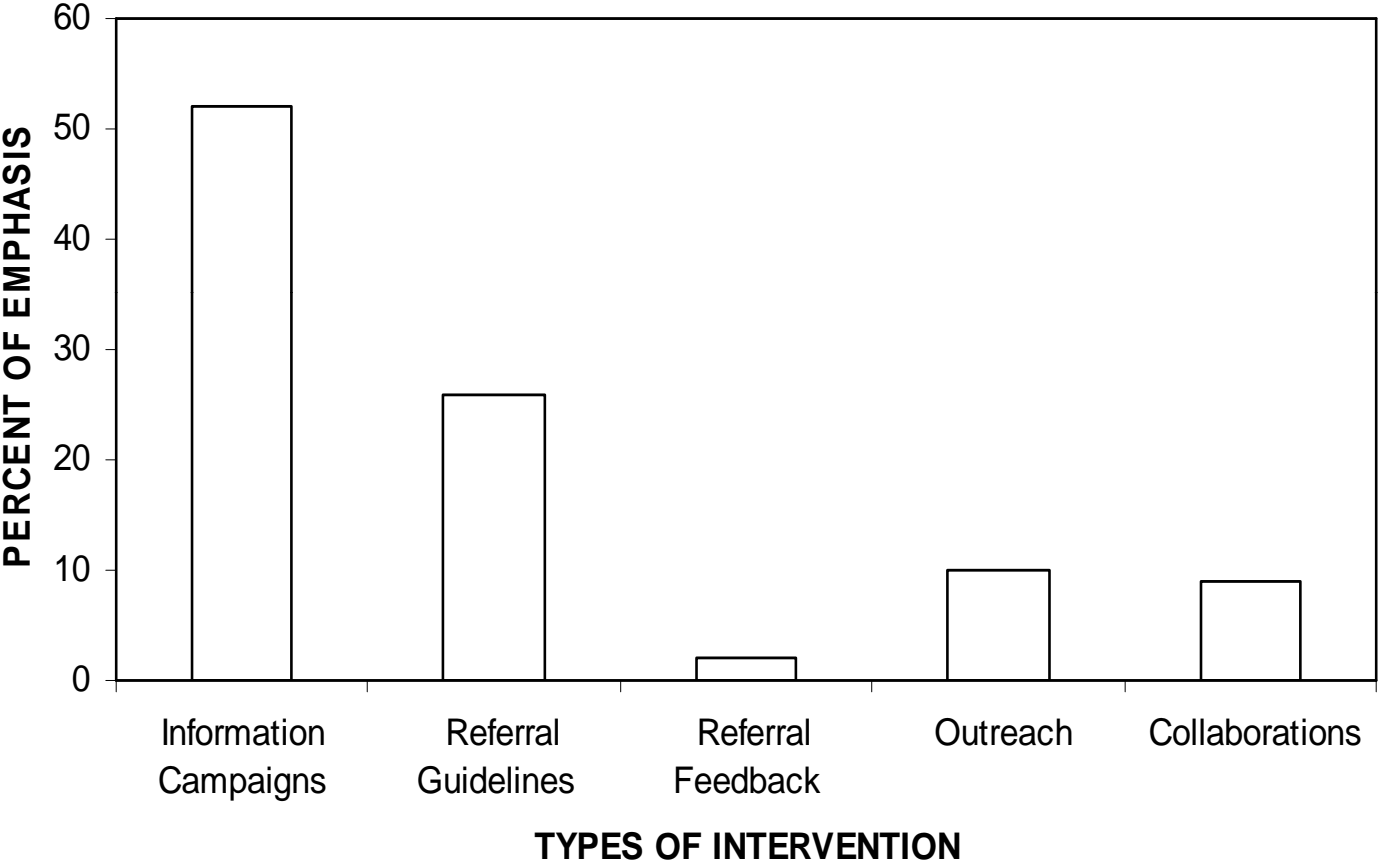
Focus of Analysis: Types of child find activities used by States to locate infants and toddlers eligible for early intervention

Types of Interventions: Information campaigns, referral guidelines, feedback to physicians, outreach to physicians, organizational interventions

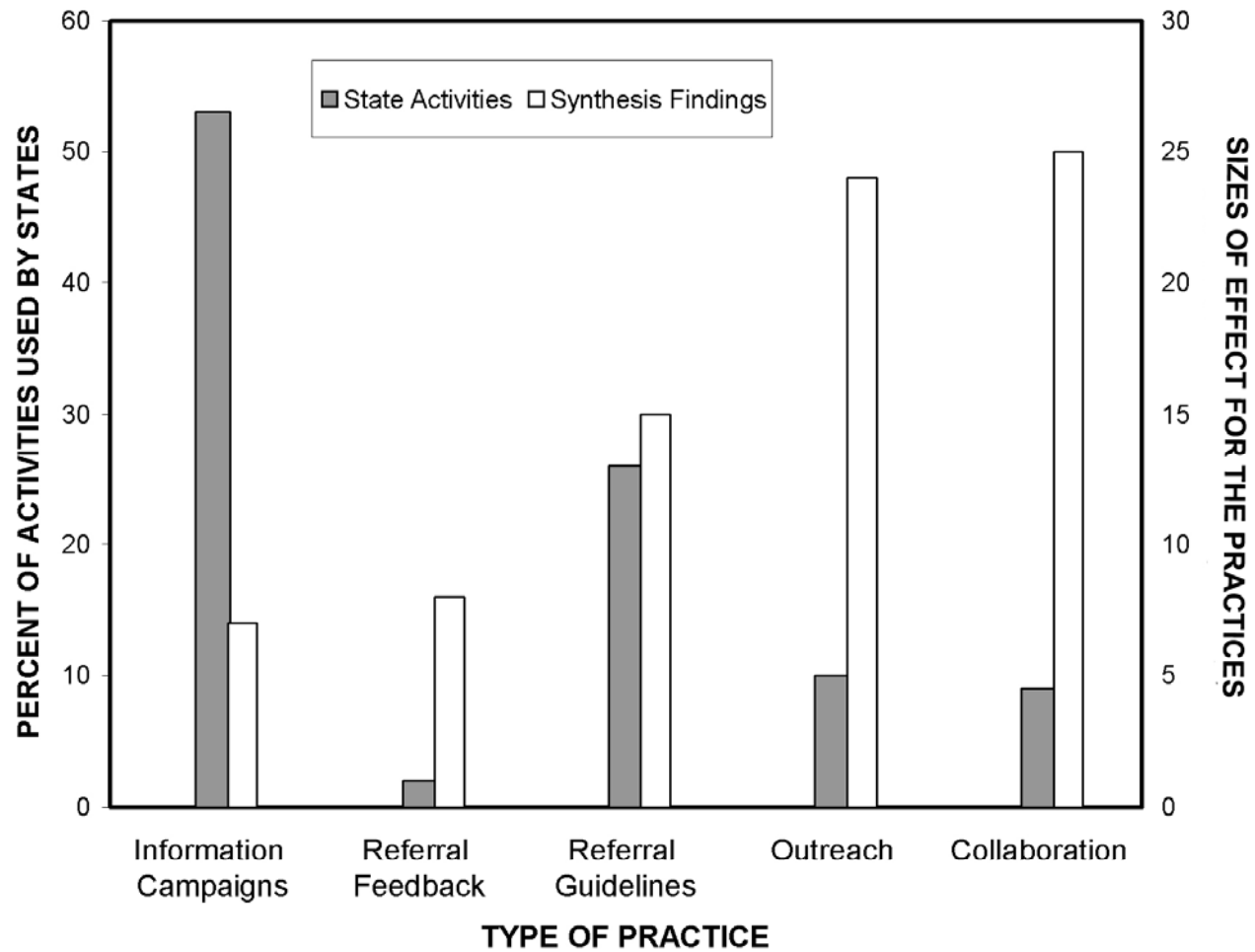
Size of Effect: Relative emphasis of different child find activities and interventions

^a Cornerstones, 2007, Vol. 3., No. 1. (Available at www.tracecenter.info).

Relative Use of Five Different Kinds of Child Find Practices



Types of Child Find Activities Used by States and the Sizes of Effects for the Effectiveness of the Different Practices in Studies Investigating Different Referral Interventions



Conclusions

- Different types of research syntheses yield different kinds of information (evidence) about the effects of different intervention approaches or practices
- Practice-based research syntheses yield information that can directly inform identification of the key characteristics of evidence-based practices
- The characteristics of evidence-based practices can also be used as standards against which practices can be evaluated in terms of the likelihood of being effective