The Role of Theory in Early Childhood Special Education and Early Intervention

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"*In these days of cultural crisis we are made increasingly aware of the social origins and the social consequences of modern science. Science not only transforms society. It is itself transformed by the very civilization it shapes. We are in the midst of a world re-orientation which will necessitate… the purposeful creation of a science of child development adequate to new patterns of living, and to new modes of conduct. Such a science will be part of a broader science of man*" (Gesell & Ilg, 1949, p. vii).

In this distant but interestingly contemporary forward to his book on child development, Arnold Gesell proposed that science will lead us forward as a civilization, with one basis being science related to how children learn and develop. Such a science of child development and its application is based on theory. Theory is a belief system about the way the world works, for example, the way young children learn and develop. Theory is designed to explain rather than change the world, although teachers may use theory to guide their actions that lead to learning and development of children. In the early history of early intervention, leaders envisioned practitioners being the implementers of developmental science (Stedman, 1977), although early research also found that practitioners knew very little about the theoretical underpinnings of curriculum implementation (Miller, 1992). A key feature differentiating professionals from technicians is understanding the theoretical knowledge that underlies effective action. In this chapter, theoretical knowledge means the theoretical/conceptual framework that underlies effective teaching and leads to children's learning and development.

Theories may be formal, in the sense that they are based on scientific experiments and observations (like the laboratory experiments of Skinner or the careful observations of Piaget) and the elaboration of those findings to explain the way phenomena like children's learning works. In its relatively short history (McLean, Sandall, & Smith, this volume), a variety of formal theories or theoretical frameworks have influenced early childhood special education. In the USA, most have been seated in psychology, applied behavior analysis, and developmental science, although sociology, systems theory, and neuroscience also influence practice (Odom & Wolery, 2003).

Practitioners also have informal theories of practice that guide their work, in our case their work with children and families (Odom, 1987). Practitioners' informal theories may draw from single or multiple formal theories, practical experience, as well as other sources of information. These informal theories of practice may be well documented, as in conceptual frameworks or theories of change that programs sometimes develop, or they may be tacit in that they reside in

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B. Reichow et al. (eds.), *Handbook of Early Childhood Special Education*,
DOI 10.1007/978-3-319-28492-7_2

the belief systems that practitioners have about children's learning.

In this chapter, the author will review the formal theories or integrated bodies of scientific findings that currently underlie practice in early childhood special education. This review will begin with a discussion of the "classical" theories or theoretical systems in psychology that have influenced early childhood special education, such as behaviorism, constructivism (focusing mainly on Piaget), psychodynamic/psychoanalytic theory, sociocultural theory (which also draws from anthropology), and the maturationalist/biological theories of development (including neuroscience). Programs of research from the field of sociology have also influenced features of early intervention and early childhood special education as has the broader, cross-disciplinary systems theory, and both will be described. Examples of applications of theories to early intervention and early childhood special education will be identified. Specific sets of practices that have emerged from different theoretical frameworks at times are procedurally similar; these will be described and their implications for practice will be discussed. The concept of a personal theory of practice will be proposed and its implications for early intervention and early childhood special education will be offered. The chapter will conclude with the proposal that teachers need to understand their own theory of practice and the formal theoretical/conceptual underpinnings of their practice, will introduce the concept of a "technical eclectic" approach in early childhood special education, and will discuss the possible relationship between theory of practice and evidence-based practices.

Formal Theories and Their Applications

Scientists develop formal theories to explain the phenomena in which they are interested. That is, they may have a theory about how the brain works, or how children develop language, or how the supply and demand for teachers may (or may not) affect teacher salaries. Technically, theories cannot be proven, but predictions (hypotheses) can be made from theory that can be supported by data collected in a systematic way. The formal theories that have relevance for early childhood special education are scientific in that they are based on collection of information in a systematic way that supports the theory. A variety of formal theories form the basis for practices in early childhood special education. In this section, the author will briefly describe the tenets or main points of theoretical or conceptual frameworks and provide examples of how they have been applied in early childhood special education or early intervention.

Behaviorism

Behaviorism is one of the major classical theories that serves as the basis for early childhood special education practice (Strain et al., 1992). The primary thesis of behaviorism is that individuals' behavior is a product of their environment. There is an explicit interest in discovering principles that lead to understanding and predicting observable behavior. Classical conditioning and operant conditioning are the two primary forms of behaviorism. Originating with Pavlov (1927/1960), in classical conditioning, a behavior (for Pavlov, this was a dog salivating) may be paired with both a stimulus that elicits the behavior (seeing meat powder) and a neutral stimulus (a bell ringing) so that the neutral stimulus eventually elicits the behavior in the absence of the original stimulus. Although used sometimes in behavior therapy, classical conditioning is used less often (than operant conditioning to be described next) as the basis for practice in early childhood special education.

Operant conditioning and its variations, proposed originally by Skinner (1953), is the main behavioral approach used in early childhood special education. In operant conditioning, an event or context (e.g., a mother looking expectantly at her baby) signals that a response (the baby smiling at the mother) will be followed by a reinforcing event (the mother smiling back, saying the baby's name, tickling the baby). The rein-

forcing event increases the probability that the behavior will occur again in similar contexts. Applied behavior analysis (ABA) (Baer, Wolf, & Risley, 1968) moved the application of the principles of behavior out of the laboratory and into human services programs such as ECSE/EI. Bandura (1969) extended the conceptualization of behaviorism to include observational learning and eventually social learning theory (Bandura, 1977) concepts such as self-regulation.

Some early childhood curricula and comprehensive treatment programs for children with certain types of disabilities (e.g., Lovaas, 1981, for young children with autism spectrum disorder) have adopted a very structured ABA approach (i.e., a high level of individual instruction delivered by a teacher and/or service provider using a technique called discrete trial training). Other researchers have designed programs to teach parents to use ABA with their children who have disabilities. A prime example of this approach is the Regional Intervention Program, which has now nearly a 40-year history of working with families and children (Strain & Timm, 2001).

ABA has, over the years, also evolved into an approach that recognizes the importance of contextual variables (Odom & Haring, 1994). In fact, a wide array of naturalistic behavioral interventions, to be discussed more later, have emphasized implementing intervention procedures when children are in natural and preferred activities and routines during the day. These techniques go by different names, such as incidental teaching (Hart & Risley, 1975), enhanced milieu language training (Kaiser & Roberts, 2013), embedded learning opportunities (Horn, Lieber, Li, Sandall, & Schwartz, 2000), activity-based intervention (Losardo & Bricker, 1994), and pivotal response training (Koegel, Koegel, Harrower, & Carter, 1999). The common features of these approaches include selecting activities that are interesting for the child, organizing the material and environment that will lead the child to initiate the behavior or skills to be learned, providing support when needed but minimizing direct adult teaching, and making sure there is a reinforcing event after the child engages in the skill or behavior to be learned.

In addition to naturalistic behavioral interventions that are designed to promote the acquisition of behavior, a system of behavioral strategies called positive behavior intervention and support (PBIS) has been designed to address children's challenging behavior (Dunlap et al., 2006). Based on a tiered system of intervention, behavioral strategies are first put into place to prevent a challenging behavior from occurring (e.g., having a child engaged in interesting and meaningful activities rather than in boring, inactive activities). For children whose behavior continues to be problematic or challenging, increasing levels of intervention supports are provided (e.g., perhaps more structured learning activities at a second level; a formal behavioral plan with a functional behavioral assessment, extinction, and/or reinforcement at a third level). A widely used example of a PBIS-like intervention approach is the Pyramid Model (Fox, Hemmeter, Snyder, Binder, & Clarke, 2011).

Constructivism

Constructivism, as a theory of children's development, is similar to behaviorism in that a central premise is that children's interactions with the physical and social environments are the basis for learning and development. It differs from behaviorism in that it focuses on the development of cognitive structures and the child's roles as the active participant in constructing a new and more mature understanding of the world. Piaget (Piaget & Inhelder, 1969) is often identified as the founder of constructivism, in that his career-long work established a theory of cognitive development that continues to have a profound influence on early childhood education. Specifically, his theory that children's development progresses through stages (i.e., sensorimotor, preoperational, concrete operations and formal operations) that consist of qualitatively different thinking processes led to a major emphasis on early childhood education during the 1960s (Hunt, 1961). The key concepts of

Piaget's theory that contribute to early education practice are (a) the emphasis on children's physical engagement with a stimulating physical environment, (b) the development of symbolic representation and language, (c) the development of symbolic play, and (d) the delineation of feature of the preoperational period.

A variety of other prominent educational psychologists, philosophers, and even physicians have contributed to this constructivist perspective on learning and development (e.g., Dewey, Montessori, Bruner). And, it is safe to say that constructivism has had more influence on contemporary early childhood education than any other formal theoretical framework. Examples of major early childhood education curriculum models based on the constructivist approach are the HighScope Curriculum (Hohmann & Weikart, 2002), the Creative Curriculum (Teaching Strategies, LLC, 2010), and the Reggio Emilia model (Cadwell, 2002). In its history, the early childhood education community, through the National Association for the Education of Young Children (NAEYC), adopted a constructivist approach that they have termed "developmentally appropriate practice (DAP)" (Copple & Bredekamp, 2009).

For the most part, constructivist approaches have been designed for children who are typically developing, and researchers and scholars have had spirited discussions about whether the constructivist approach is individualized and/or intense enough to promote learning and development for young children with disabilities (Carta, Schwartz, Atwater, & McConnell, 1991). Although that question remains open for debate, and in many ways is an empirical question, there have been efforts by NAEYC and the Council for Exceptional Children's Division for Early Childhood (DEC) to issue joint vision statements about ways in which children with disabilities may benefit from enrollment in classes following an NAEYC/DAP model (DEC/NAEYC, 2009). In addition, a prevailing early childhood special education perspective is that DAP curriculum approaches are necessary but not entirely sufficient to support the learning needs of many children with disabilities (Odom & Bailey, 2001). In such cases, there may be supplemental and complementary intervention plans that may need to be implemented in inclusive/DAP classroom settings (Winton, this volume).

Some early childhood special education leaders and researchers, however, have adopted a decidedly constructivist approach in intervention programs that involve parents. For example, Mahoney and colleagues (Mahoney & Perales, 2003; Karaaslan & Mahoney, 2013) have developed a responsive teaching intervention that focuses on developmentally pivotal behaviors that lead to growth and development of young children with disabilities.

Sociocultural Theory

Although having similarities to constructivism with its focus on cognitive and language development, sociocultural theory emphasizes the critical importance of understanding the influence of cultural and historic context on children's development, as well as the role of social processes in mediating the learning and development of children. Much contemporary sociocultural theory is based on the work of the Russian psychologist Vygotsky (1978). Vygotsky, although sometimes grouped in the constructivist camp, differed from Piaget in his emphasis on adults or more advanced peers as mediators of children's understanding and learning. Vygotsky specified that children are motivated to learn when learning experiences are within their "zone of proximal development," that is, at a slightly more advanced cognitive level than their current level. He and followers proposed that adults and more advanced learners are social mediators of children's learning in that they may assist the child in interpreting such new information or concepts through a strategy called "scaffolding" (e.g., carefully planning activities, conversations, modeling). Also, Vygotsky proposed that culture affects the form of social mediation that occurs in child development. Following the tradition of Vygotsky and building on the mediated learning work of Feuerstein (1980) and Klein (2003), Schertz, Odom, Baggett, and Sideris (2013) have

developed a parent-mediated model for promoting joint attention of toddlers with ASD in which parents follow a set of mediated learning principles.

Sociocultural theory also draws from anthropology in its interest in practices within and across cultures that relate to child development. Rogoff (2003) has applied sociocultural theory more directly to child development by proposing (as did Vygotsky) that children learn in social contexts through observing and imitating adults, and much of this learning often occurs in everyday activities and routines (Rogoff et al., 2007). Although a psychologist, she has examined these constructs across cultural contexts (Rogoff, 2011).

Extending this concept, Lave and Wenger (1991) discussed the concept of *situated learning* that occurs during everyday activities and in communities of practice. Novices or less-abled individuals may learn the necessary skills through a process called *legitimate peripheral participation*, which means that individuals learn through observing, participating in a part of a practice or activities, and gradually using skills in full participation. The concept of peripheral or partial participation with increasing independent participation across time, adult mediation of social experiences, and learning through engagement in activities that are personally interesting to the child all underlie inclusive early childhood education for children with disabilities (Palmer et al., 2013).

Having even deeper roots in anthropology, ecocultural theory also proposes that developmental pathways for children are made up of everyday activities and routines (Weisner, 2002). Within cultures there are *niches* (i.e., specific routines or settings) that provide the basis for learning and development, and for young children these niches are within families and communities. The ecocultural approach has been the basis of much research on families of children with intellectual and other disabilities (Skinner & Weisner, 2007) and has long been established as a positive basis for establishing family-centered programs (Bernheimer, Gallimore, & Weisner, 1990; Dunst, Bruder, Trivette, & Hamby, 2006). In an ambitious program of research, Dunst and colleagues (Dunst, Hamby, Trivette, Raab, & Bruder, 2000) surveyed over 3300 parents to identify the potential everyday natural learning experiences that occur for young children with disabilities and documented the association of natural learning opportunities on optimal child behavior change (Dunst et al., 2001). The practice of situating learning in everyday activities in the home and community, as reflected in this work and suggested by sociocultural theory, is a central feature of the current practice in early intervention and early childhood special education (DEC, 2014).

Psychodynamic Theory

Sigmund Freud was the father of psychodynamic theory (Schimmel, 2014). Best known for his development of psychoanalysis as a clinical treatment of mental health disorders, Freud's theory of the stages of psychosexual development resulted in increased interest in the early years of life, and the relationships formed then, as having a lasting impact over the adult years. With regard to early childhood special education, Freud's influence on the field has come through individuals he in fact influenced, such as Erikson (1950) and Bowlby (1958) and the attachment theorists (Grossmann & Waters, 2005). In turn, their emphasis on mother-infant interaction and attachment leads investigators to examine the different forms of attachment that may exist for children with developmental delays (Emde & Brown, 1978) and visual impairment (Fraiberg, 1975). Researchers have developed intervention approaches to promote positive, reciprocal interactions between parents and children who are "at risk for development delay" with the intent of building strong and positive attachment (Berlin, 2012). Much of this intervention work can be traced to the interest in the early years that gained momentum with Freud's work. However, it is also important to point out at least one application of psychodynamic theory that was iatrogenic for mothers who had children with autism. In the 1950s, Bettelheim (1967) theorized from a psychodynamic perspec-

tive that autism was caused by cold, non-nurturing relationships between mothers (i.e., he called them "refrigerator mothers") and their children, with the treatment being to remove the child from the home and into a residential setting.

Biological and Neuroscience Theory

Some theories of child development are seated within the biology of the child. That is, there is a belief that the child's development will follow a specific course, determined by his/her genetic and physical makeup as long as he/she is healthy. On the preverbal "nature vs. nurture" continuum of perspectives on child development, behaviorism, constructivism, and psychodynamic theories lie close to the nurture end of the continuum. Biological and neuroscience theory (at least up to this point) lie more closely to the "nature" end of the continuum.

Maturationist Theory

Arnold Gesell and colleagues (Gesell & Ilg, 1949) proposed one of the earliest and most influential theories of child development and it is the classic representation of a maturationist perspective. They propose that children's development follows a very predictable pattern and that given adequate health and presumably social experiences, children will acquire skills through maturation. Such maturation is genetically determined, with the influence of the environment playing a smaller role. Gesell's work was critically important in focusing attention on early development, "mapping" of the normative developmental sequence, and providing a standard for determining, especially during the early years, when children's development was off course (Gesell & Amatruda, 1941).

Several applications of Gesell's work in early childhood special education are apparent. In specifying expectations for normative behavior and skills at specific ages, Gesell and colleagues were able to set "readiness standards" for school (i.e., the skills children need to have when they begin public education), and quite a number of school readiness assessments have followed in that tradition (e.g., Bracken, 2007). One educational practice following from this work was to advise parents to delay children's school entrance if they did not have the skills identified as preparing them for the school curriculum, or assigning the children to a transitional kindergarten or qualification for special education services. Alternatively, the precise mapping of young children's development allowed for the creation of early screening tests and diagnostic instruments that are now used for identifying infants and young children with developmental delays. Another practical influence of Gesell's work has been the development of a variety of criterion-referenced assessments [e.g., the LAP-3 (Chapel Hill Training and Outreach Project, 2008), the Hawaii Early Learning Profile (Warshall, 1995)] that practitioners frequently use to determine the learning needs of young children with and without disabilities and their goals.

Critical Periods

Emerging primarily from the field of ethology and animal behavior as well as neuroscience, there has been a common belief that children may be particularly susceptible to learning or in need of sensory or social experiences during certain times in their lives in order to fully develop. The theory is that for the brain to develop normally, such sensory experiences must be present—these are called *experience-expectant* forms of development (Bruer & Greenough, 2001), and it occurs in basically the same way for all infants and young children. For example, if an infant is deprived of visual stimuli during the first year of life, he/she will lose visual perception even if visual stimuli are restored later (Horton, 2001). Also, during the second year of life, children begin to acquire vocabulary and use words to communicate. Researchers believe that language deprivation (e.g., through a hearing impairment, otitis media, or other forms of deprivation) during that period of life may lead to ongoing language problem.

However, Bruer and Greenough (2001) propose that much of children's learning and development is *experience-dependent,* meaning that individual experiences affect children. For example, early animal research demonstrated the effect of complex and isolated environments on brain development (Green, Greenough, & Schlumpf, 1983). Although researchers do not agree entirely on the specific applicability of the critical period theory to human children (Bailey, Bruer, & Symons, 2001), the conclusion that much of human development is experience-dependent is widely accepted and has implications for early childhood special education.

The belief in critical/sensitive periods underlies practice in early childhood special education. At the most basic level, a major rationale for early intervention is that it will have a lasting and important effect on children's development, and the belief in the importance of such early experiences is prevalent across cultures (Odom, Hanson, Blackman, & Kaul, 2003). For very young children with hearing impairments or deafness, there are great efforts to screen and identify the disability early so that it can either be corrected before the formative period for language acquisition during the second year of life or there can be a different language system provided (American Academy of Audiology Clinical Practice Guidelines, 2012). The assertive "child-find" provision of Part C of IDEA and the massive efforts by the Centers on Disease Control and Prevention to identify infants and toddlers with autism spectrum disorder are also based on the general belief that intervention at an early age will produce greater effects than will occur later.

Neuroscience and Brain Development

One could call the twenty-first century the Era of Neuroscience. Although researchers have long acknowledged the malleability of children's neurology and recovery from early insult or deprivation (Gallagher & Ramey, 1987), the publication of the National Academy of Sciences report *From Neurons to Neighborhoods* (Shonkoff & Phillips, 2000) elevated interest in early brain development. A major recommendation from that report was that there be a stronger integration of the basic science of human development and early childhood intervention (p. 405). The very precise delineation of brain development during the early years (Kagan & Herschkowitz, 2005) is an interesting parallel to Gesell's mapping of children's behavioral development in the twentieth century and provides promise that principles of brain development might guide intervention or educational practice. Major initiatives have built their argument for early intervention impact on experiential factors, such as "toxic levels of stress," that may negatively affect brain development and factors that may buffer such effects (Shonkoff et al., 2012). The arguments are persuasive and with advancing neuroimaging technology, the promise is real. At this point, however, little information generated by neuroscience has been translated into intervention programs or procedures that have then been validated through efficacy trials. There are examples where developmental-behavioral interventions have produced changes in brain activity, with one of the best examples being Dawson's and Rogers' detection of EEG changes resulting for young children with ASD and their families participating in the Early Start Denver Model (Dawson et al., 2012). The more frequent occurrence has been program developers making unsubstantiated claims that their intervention program is effective or evidence based because it follows principles of neuroscience [e.g., Brain Gym® (http://www.braingym.org/index)]. The Doman and Delacato program prominent in the 1960s and 1970s is a classic example of a program based on neurological development that has been discounted (American Academy of Pediatrics, 1982).

Sociology and Anthropology

A variety of theories and/or conceptual frameworks fall loosely under the topic of sociology and anthropology. Theory within sociology has also influenced the concepts of social integration and inclusion, which are major factors in early

childhood special education. The impact of the child on the family, effects of having a child with disability and stress, and theory of loss and grief all focus on family issues and have had implications for practices. As noted previously, there is an increasing recognition of the sociocultural perspective on child development, which spans the disciplines of anthropology and psychology.

Social Integration and Inclusion

The concept of social integration, a cornerstone of successful inclusion, flows directly from the work of Emile Durkheim, the father of modern sociology (Berkman, Glass, Brissette, & Seeman, 2000). He conceptualized social integration as interaction among members of groups in society that leads to mutual understanding. Although his early work addressed social integration of socially isolated individuals in society and associations with health, the theme of integration was present in Nirje's (1969) classic paper on normalization, which had such a great influence on the normalization and inclusion movement in the USA (Wolfensberger, 1972). The Least Restrictive Environment provision of IDEA could also be seen as a reflection of the effort to promote social integration and inclusion in educational settings and has led to major inclusion efforts in the USA (Odom, Buysse, & Soukakou, 2011). For young children with disabilities, the Joint Statement on Inclusion developed by DEC and NAEYC (DEC & NAEYC, 2009) reflects these very themes in that one of the desired results from inclusion for children with disabilities is the development of friendships and social relationships with typically developing children.

Family Sociology and Family-Centered Programming

Sociology of the family examines the family as a unit of socialization and an institution within American society (Cohen, 2014). Sociological research and theory have influenced current early childhood special education practice. These include transition to parenthood (Odom & Chandler, 1989), the integration of a child with severe disabilities into the family (Farber, 1959), and the ABCX (Hill, 1949) and double ABCX (McCubbin & Patterson, 1982) models of families' reactions to crisis and coping strategies that buffers stress (Adams, 1988), particularly when there is a child with disabilities (Bristol, 1987). The awareness of family functioning, the disequilibrium that sometimes occurs when there are young children with disabilities enter the family, and the family needs that underlie the nurturing environment that families provide for children are some of the bases for establishing a family-centered approach to early intervention and early childhood special education (Dunst & Espe-Sherwindt, this volume). It should be noted that many of these issues overlap with systems theory conceptualization of families and influence, but the sociological perspective on family integration generally preceded systems theory applications.

Systems Theory

General systems theory is a conceptualization of principles that potentially run across disciplines (e.g., biology, engineering, psychology, education) and explain the interacting influences of features of different environments or elements of their environments (von Bertalanffy, 1968). Although an oversimplification, the adage that "a system is more than the sum of its parts" conveys the general systems theory idea that the interrelationship of active elements within, and even across, systems may have a stronger influence on outcomes that the individual variables within systems. A number of theories or conceptual frameworks that affect early childhood special education are based on general systems theory. These include the ecological theory of child development, family systems theory, and some models of implementation science.

Ecological Systems Theory

Bronfenbrenner's (1979) ecological systems theory has been one of the most important theoretical influences on early childhood special education. Bronfenbrenner proposed that a child exists within *microsystems* like the home or a classroom that directly affect her/his development. Individuals within this system (e.g., mother, teacher, siblings, peers) directly affect the child (e.g., through talking, teaching), and the child also exerts a reciprocal influence on the other members of the system. A child participates in multiple microsystems. Those microsystems and individuals within them have influences on other microsystems. This cross-system influence is called a *mesosystem*. For example, the communications that teachers have with parents about a child's performance when they are in a classroom is a mesosystem influence. The micro- and mesosystems exist within a large system of influences that exist outside of the environments in which the child participates but has influences on those environments. Bronfenbrenner called this the *exosystem.* With regard to early childhood special education, this could be seen as school district policies that affect teachers' practices with the child, with the policies sometime being affected in a reciprocal way by teacher influences (e.g., communications with supervisors, teacher unions). In turn, the exosystems are themselves seated within a larger societal and cultural context, which is the *macrosystem*. An example of a macrosystem influence is the change in demographic trends in the USA that leads to modifications in school practices to be responsive to children and families who do not have English as a first language. In his later writings, Bronfenbrenner and Morris (2006) extended the ecological systems model to include the *biosystem* (e.g., genetic, health, and other biological influences on the child, with Down syndrome being one example) at the center of the ecological systems model and the *chronosystem*, which acknowledges that ecological systems and their interrelated influences change across time (e.g., changes that occur when a child moves from preschool to elementary school).

As noted, the ecological systems model is frequently employed to understand and plan services and programs in early childhood special education. For example, in a program of research spanning 5 years, Odom and colleagues conducted an ecological systems study of preschool inclusion to determine facilitating factors and barriers that affected the provision of inclusive services (Odom, 2002), the stability of those services across time (Odom, Wolery, Leiber, & Hanson, 2002), and the transitions of children receiving those services into elementary school (Hanson et al., 2001). An ecological systems conceptualization of factors influencing implementation of preschool inclusion appears in Fig. 2.1 (Odom et al., 1996). Outside of early childhood special education, researchers have applied ecological systems

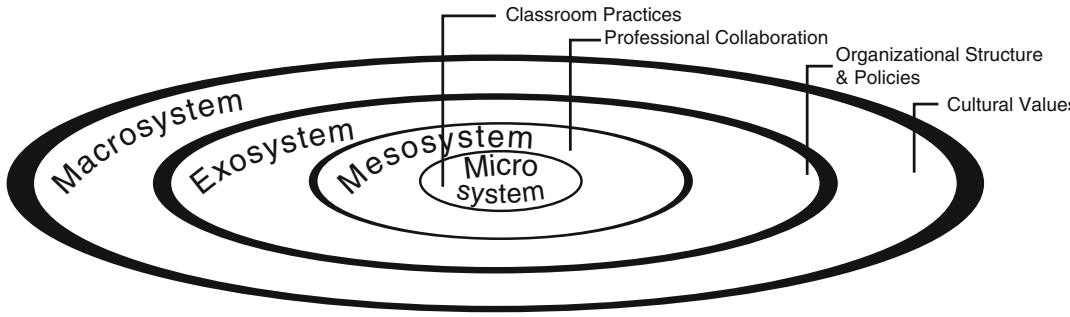

Fig. 2.1 Bronfenbrenner's ecological system framework and factors affecting the implementation of inclusion

theory to such diverse issues as understanding childhood obesity (Boonpleng et al., 2013), working with migrant families (Paat, 2013), and transitions of children from child welfare to the criminal justice system (Marshall & Haight, 2014).

Family Systems Theory

Similar to the previous discussion on family sociology, family systems theory is the application of the general systems theory model to understanding the inner workings of families (Broderick, 1993). It focuses on the interactions within families, the mutual influences exerted by family members, and the inclusion of a new family member (i.e., such as a child with disability) on family members interactions and functioning. In early childhood special education, viewing the family as a system has been instrumental in informing intervention work in the home with primary caregivers and bringing other family members into the intervention process (Seligman & Darling, 2007). For example, being sensitive to the fact that when a practitioner works with the mother to support the communication skills of a child with disabilities in the home, it may affect the mother's relationship and interactions with the father and the child's siblings (e.g., the mother could gain expertise that leads to the father's resentment, the siblings may experience less attention from the mother). In addition, family systems theory should raise the sensitivity of the practitioner to cultural variations among families. For example, although the mother may be the primary caregiver, from some cultural backgrounds the father may want to be the spokesperson for the family in the individual education plan (IEP) meeting.

Implementation Science

Researchers in implementation science study features of organizations, such as schools, that affect the adoption and use of innovative and effective practices (Aarons, Hurlburt, & Horowitz, 2011; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). It has emerged as a primary influence in early childhood special education and the larger field of special education in the last decade (Boyd, Kucharczyk, & Wong, this volume; Cook & Odom, 2013). Scholars have proposed different models of implementation science, but a characteristic of the primary models is their use of a systems approach to identifying variables that support or interfere with implementation (Odom et al., 2010). Fixsen and colleagues (Fixsen, Blase, Metz, & Van Dyke, 2013) proposed a model of implementation for special education in which the active variables are the organizational leadership (e.g., district or state level special education personnel), external training and coaching support, coaching support within the system, and the implementers themselves. Features of this model that exemplify a systems approach are the importance of "buy-in" from members of all levels of the system (not just the supervisor, principal, or teachers), the "stage-like" process of implementation that goes from exploration to full implementation, the recognition that implementation requires time and ongoing support (i.e., it takes more than just a single workshop), and a feedback loop of information that is shared among the higher levels of the system, middle managers, and the practitioners implementing the program. A primary example of the application of implementation science to early childhood special education is the work by Dunst, Trivette, and Raab (2013) to differentiate implementation and intervention practices and highlight the features of adult learning that may contribute to implementation of important intervention practices with a high level of fidelity.

Practices and Theoretical Foundations

At the outset of the chapter, it was proposed that similar practices may emerge from different theoretical foundations; that in building an intervention approach, developers sometimes draw from different theoretical orientations; and that indi-

vidual practitioners may choose to take a technical eclectic approach that incorporates practices from different theoretical frameworks. Each of these points will be discussed in this section.

Similar Practices from Different Theoretical Perspectives

The "topography" of a teaching practice is the physical and social actions that occur when a teacher, other practitioners, or perhaps the primary caregiver at home arranges the learning experience and interacts with the student to promote the child's learning and development. Teachers following different theoretical or conceptual approaches may, at times, follow very similar topographies. One prime example is the use of prompting from the behaviorist tradition and scaffolding from the constructivist tradition. Both involve the adult (usually) interacting in a way that leads the child to engage in a more advanced (than their current performance) behavior, skill, or understanding. For example, constructivist- and behaviorist-oriented teachers interested in promoting children's communication may both set up the learning activity to create opportunities for using a specific form of communication such as requesting a material using words. If the child requests an object, the teacher may restate (i.e., elaborate) the child's verbalization at a slightly more advanced level and give him or her the object requested. If the child only points to the materials she or he needs, the teacher might wait with an expectant look on her face for the child to use words. If he or she does not respond, the teacher may provide a prompt or scaffold for using a two-word request (e.g., want paste, paste please), which is slightly more advanced than their current level of communication (i.e., in their zone of proximal development).

Other examples for children with ASD, a floortime play activity (Greenspan & Wieder, 2006; Solomon, Van Egeren, Mahoney, Quon-Huber, & Zimmerman, 2014) that comes from a psychodynamic tradition and a developmental-behavioral play activity promoting interaction between adults and child (Dykstra, Boyd, Watson, Crais, & Baranek, 2012), could well have nearly identical topographies. The important point in using these interventions with similar topographies is for practitioners to understand the conceptual framework they are following and the eventual goals toward which they are directing their efforts. This understanding will lead to perhaps slight but important differences in the topographies as the interventions extend across time and may lead to the child accomplishing different goals at the end of the intervention program.

A primary example of this blending of topographies is the development of naturalistic interventions for toddlers with ASD and their families. A variety of intervention approaches have been created based on a naturalistic behavioral approach (e.g., pivotal response training, enhanced milieu language interventions) (Pierce & Schreibman, 1997), a developmental approach (e.g., Wetherby & Woods, 2006), or an approach that employs both behavioral and developmental techniques (e.g., Early Start Denver Model). These models or techniques have some procedural difference but are defined more by the significant overlap in intervention topography. In recognition of the similarities of these approaches and the common goals they have for children and families, investigators representing the different theoretical perspectives proposed creating a blended classification for these approaches as naturalistic developmental behavioral *interventions* (Schreibman et al., 2015).

The recommended practice movement represents another set of examples in which practitioners may select practices that follow different theoretical/conceptual frameworks. For what is now a nearly 25-year tradition, the Division for Early Childhood of the Council for Exceptional Children (DEC) has identified recommended practices in early intervention and early childhood special education (Division for Early Childhood, 2014). The identification of the original practices was through professional and family judgment (Odom & McLean, 1996), and subsequent revisions did build on a thorough review of the empirical literature from the 1990s (Smith et al., 2002). The current edition of the

practices is based on constituent knowledge and values as well as research (DEC, 2014), although the linkage to research is not clearly described in RP materials. The recommended practices are not tied closely or explicitly to theory, and so might be consider eclectic in nature.

In their identification of evidence-based, focused intervention practices for children with ASD, Wong et al. (2015) conducted a thorough review of the empirical literature from 1990 to 2011 using a systematic process and stated criteria to identify 27 evidence-based practices. Although most of the practices were based on ABA techniques, a number of practices had other theoretical or conceptual foundations. Using evidence-based practices as an anchoring feature of their model, Odom, Hume, Boyd, and Stabel (2012) proposed the possibility of following a *technical eclectic* approach in which teachers establish measurable and observable goals for children and used the goals to select individual-focused intervention practices, which could potentially have different theoretical foundations.

Individual Professional Theory of Practice

Early childhood special education is a teaching profession, and teaching practice is based on professionals' beliefs and philosophies of how children develop and learn and how to best promote that development and learning for children with disabilities (Odom, 1987). These theories have been called theories of practice (Argyris, Putnam, & Smith, 1985), practice theories (Zeichner & Liston, 1996), and theories of change (Weiss, 1995). Teachers' individual theories of practices are informed by several sources. Academic or theoretical knowledge is one source, and Zahoric (1986) proposed that this knowledge is most influential for teachers early in their career. As teachers gain more experience in teaching and with different children, they may draw more directly on their own experience, that is, their personal successes and failures.

An exception to this formation of a personalized theory of practice is when teachers adopt a specific comprehensive curriculum model or theoretical approach that has a clearly articulated fidelity measurement. For example, a teacher may choose to use the Incredible Years program for promoting children's social competence (Reinke, Stormont, Webster-Stratton, Newcomer, & Herman, 2012). It has a conceptual framework and an embedded theory of practice that the teacher would adopt also in order to implement the program with fidelity. Similarly, a practitioner may decide to get board certified as a behavior analyst (i.e., a BCBA credential), which would clearly specify a theory of practice (i.e., behaviorism) that the teacher or service provider would follow.

Conclusion

A variety of formal theoretical and conceptual frameworks underlie the practice of early intervention and early childhood special education. Practitioners may adopt a single formal theory to guide their work (e.g., a Vygotskian form of sociocultural theory), or they may draw from multiple theories to form their own theory of practice (Odom & Wolery, 2003). It is important to return to a statement made at the outset—theories are designed to explain, not to change things. In early childhood special education, the application of theory to practice comes through applied educational science in which researchers empirically document the efficacy of practices (based on explicit or implicit theory). Identification, delineation, selection, and implementation of those evidence-based practices, then, are the routes through which teachers and other practitioners base their teaching if they are going to follow a model of instruction based on intervention science. Even when following such a model, practitioners must be vigilant about assessing children's progress toward their goals and using the information to judge utility of their theory of practice.

Acknowledgment The author thanks Laura Hall and Stephanie Ridley for their helpful comments on this chapter.

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