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Implementation Science, the Developmental Systems Approach, and Family-Centered Practices

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Implementation Science, the Developmental Systems Approach, and Family-Centered Practices

Communities around the world continue to mobilize to provide early intervention services and supports to young vulnerable children and their families. Systems of early intervention have become both accepted and expected in developed countries, and extensive efforts are underway to provide similar systems in developing countries. Indeed, ample evidence exists indicating the benefits to children and families resulting from a system of early intervention services and supports in both developed (Guralnick, 2011, 1997) and developing countries (Aboud & Yousafzai, 2015). Of further importance, parents are generally highly satisfied as reports indicate that they find early intervention to be of considerable value with respect to promoting their child's development as well as enhancing their ability to advocate on behalf of their child (Bailey et al., 2005; Lanners & Mombaerts, 2000; Peterander, 2000; Raspa et al., 2010).

One persistent and complex challenge to community-based early intervention systems is the ability to address the needs of an extraordinarily diverse population of young vulnerable children and their families. This population includes substantial numbers of children at risk for developmental problems due to environmental factors such as poverty, abuse, and neglect as well as children at risk due to biological factors such as preterm birth or familial risk due to genetic factors (e.g., high risk for autism and other developmental problems for younger siblings of children diagnosed with autism spectrum disorder). Major vulnerable groups also include children with established categorically-defined neurodevelopmental disorders, including those with

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heterogeneous developmental delays (irrespective of etiology), children with an autism spectrum disorder (ASD) diagnosis, children with a range of language and communication disorders, and those classified with various forms of sensory and motor disorders. Such categorizations of vulnerable groups are common in our field and are, in many ways, useful for both research purposes and as a way to assist in the initial organization of resources and strategies for service provision. At the same time, however, this nosology tends to obscure the fact that all of these vulnerable groups overlap extensively and display complex and diverse individual developmental trajectories. Although community-based early intervention programs often include programs that are highly specialized, devoted to a particular categorical subgroup or more rarely to an etiologic subgroup, most communities have adopted or are in the process of moving toward providing a comprehensive early childhood system capable of accommodating all children in similar way and in similar settings in as inclusive a manner as possible (Guralnick & Bruder, 2016). Specialized services, curricula, and strategies certainly have an important role as part of this system, but the systems structure itself is designed to accommodate all children.

In this chapter, three issues are considered that are relevant to enhancing the ability of community-based early intervention systems to be organized to provide supports and services for such a complex and diverse group of children and families in an integrated, comprehensive, and inclusive manner. The first issue concerns what is generally referred to as implementation science--the ability of communities to implement evidence-based interventions with high levels of fidelity, efficiency, and effectiveness (Halle, Metz, & Martinez-Beck, 2013). These evidence-based interventions are generally the result of a systematic program of well designed and often highly controlled research studies (intervention science). However, the ability to

"scale-up" evidence based interventions in communities has been and continues to be a critical problem in our field (implementation science). The second issue focuses on an organizational framework for early intervention systems designed to identify developmental mechanisms and intervention principles that can be applied to all vulnerable groups. Referred to as the Developmental Systems Approach, this framework can guide the design, implementation, and evaluation of community-based early intervention systems, including developing supportive policies to ensure that adequate resources are available (Guralnick, 2005b, 2011, 2015). The third and final issue to be addressed is the essential role that family-centered practices play in both implementation science and the Developmental Systems Approach to support the development and refinement of community-based early intervention systems.

Implementation Science

Difficulties translating findings from intervention science to community programs is a common problem for numerous fields including health, education, and social services, among others. This is certainly true as well for early intervention programs and the systems within which they are embedded (Bruder, 2010; Halle et al., 2013). In recent years the field of implementation science has emerged in an effort to provide our field as well as others with a better understanding of the processes and components that must be considered as communities develop comprehensive early intervention systems that are consistent with research-based best practices. Emerging from this work is a recognition that in order to achieve desired outcomes when scaling-up interventions many stages are required that may take years to fully implement, especially when considering comprehensive early intervention programs.

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Unquestionably, a team of capable community professionals and committed others is needed to put all the core components together to implement effective systems in an integrated and effective manner. This becomes apparent as community programs move through the well described implementation stages of exploration, installation, initial implementation and, finally, full implementation (Fixsen, Blase, Metz, & Van Dyke, 2013). As the authors point out, in order for successful implementation at each stage to occur, communities must engage in processes that are both innovative and lend themselves to sustainability.

Within these broad implementation stages a number of core implementation components have been identified to guide communities in a more detailed manner, all of which need to be integrated into a coherent effort. These components include decision support data systems, facilitative administration supports for sophisticated leadership and decision-making, the ability for systems intervention to gather needed resources, the recruitment and selection of staff with appropriate preservice training and appropriate inservice training opportunities, the availability of consulting and coaching procedures, and staff performance evaluation processes (Fixsen, Blase, Naoom, & Wallace, 2009). These components constitute the dimensions of competency required for quality implementation, organizational features that support implementation and, of course, a leadership group to develop and modify policies and direct problem-solving strategies to achieve goals (see Metz, Halle, Bartley, & Blasberg, 2013).

The demands of implementation science are considerable when community-based early intervention systems seek to scale-up programs based on research findings for such diverse and complex groups of vulnerable children noted earlier. As

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our field continues to move further in the direction of establishing inclusive early childhood programs (Guralnick & Bruder, 2016), the need to implement evidence-based comprehensive early intervention becomes increasingly apparent. Yet when communities attempt to do so they are faced with large numbers of possible curricula from which to select, often linked to specific groups of vulnerable children, and varying in terms of targeted area and comprehensiveness. Chronological age and children's developmental level are also among the many factors that enter into decision-making. When considering these diverse curricula and related interventions, communities must also contend with the varying degrees of evidence for their effectiveness. Accordingly, the level of confidence in any given intervention program will be determined by many factors, including the parameters related to the characteristics of children and families to which specific research findings can be applied.

Moreover, many research-based interventions in our field do present theories of change which have formed the basis for the specific strategies and methods of implementation selected. Here, too, however, diversity is extensive, with conceptual frameworks, for example, extending across the entire range of behaviorally-oriented and developmentally-oriented approaches. Accordingly, communities interested in developing comprehensive early intervention systems must also contend with this lack of a common conceptual framework. These differences create, among other factors, variations in the comprehensiveness of the interventions, and the degree to which interventions are designed to provide continuity over time. Moreover, as indicated, many of these interventions, even with a strong evidence base, are often narrowly focused on a particular target population (e.g., toddlers with an ASD diagnosis) or on achieving a particular goal (e.g., improving joint attention). This is

quite understandable and constitutes recognition of the complexity of the population of vulnerable children and their families and the diverse interventions that are needed across the early intervention period. Yet, as suggested later in this chapter, evidence now suggests that a conceptual framework is available that has identified common developmental mechanisms and principles capable of guiding the selection and implementation of research-based findings that can be incorporated into inclusive and comprehensive community-based early intervention systems.

The Translational Research Cycle

Before discussing the conceptual framework that can be of value in assisting communities to establish or refine comprehensive early intervention systems, it is worthwhile considering how evidence-based early intervention strategies, programs, or curricula develop and are evaluated within a research context. An idealized version of the Translational Research Cycle common to biomedical research but adapted to the various stages of behavioral/educational research in early intervention can be found in Figure 1. The cycle begins with as clear a characterization of the vulnerable groups of interest as possible. Definitions of vulnerable groups noted earlier (e.g., developmental delay, ASD, sensory and motor disorders, environmental risk, biological risk, language and communication disorders) have constituted a useful starting point. Based on these categorical definitions the developmental science characterizing categorical risk and disability groups as well as narrower subgroups (e.g., based on developmental level, gestational age, cumulative risk index, or combinations of risk and disability factors) has provided extremely valuable information about the course of children's development across the early childhood period. In particular, for numerous groups

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and subgroups extensive information is now available with respect to children's developmental resources (i.e., cognition, language, motor, socio-emotional, and sensory-perceptual development) as well as their organizational processes (i.e., executive function, metacognition, social cognition, motivation, and emotion regulation). Of importance, it is these developmental resources and organizational progress that are drawn upon and coordinated as children carry out their goals and display their level of social and cognitive competence in everyday situations (Guralnick, 2011). Characterization of subgroups has been further refined in recent years with respect to genetically-based etiologic subgroups including children with Fragile X syndrome, Down syndrome, and Williams syndrome (Dykens, Hodapp, & Finucane, 2000; Fidler, Daunhauer, Will, Gerlach-McDonald, & Schworer, 2016). This process of more detailed characterization and increasing specificity of subgroups is certain to continue and will provide professionals working in early intervention with valuable information to consider when developing intervention plans.

The Translational Research Cycle

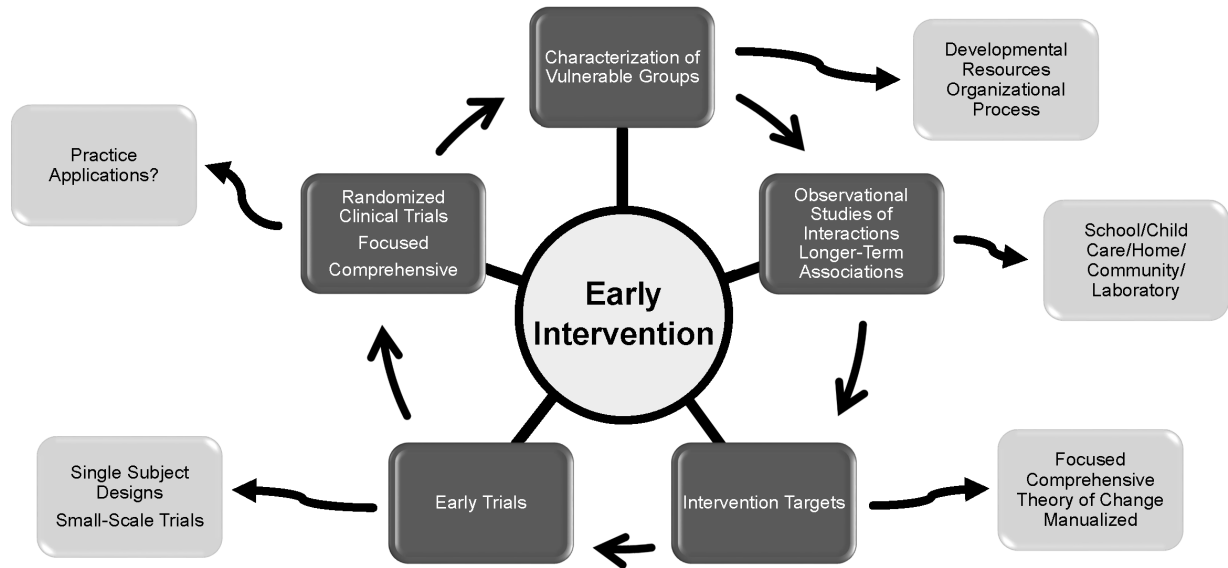


Figure 1. The Translational Research cycle in the context of early intervention.

In the next stage of the Translational Research Cycle, observational studies of experiential influences on children's development for a given group or subgroup are carried out. These observations can take place in schools, child care settings, homes, places in the community, and even laboratory environments such as those arranged to assess parent-child interactions or children's peer interactions. The idea here is to generate hypotheses about environmental factors amenable to change that can alter children's developmental trajectories. Examples might include parental responsiveness in specific situations, types of materials that tend to engage the child in extended exploration, availability of stimulating materials in the home, attentiveness to literacy activities in preschool programs and child care settings, level of participation in family routines, parent and teacher interactions that scaffold instruction properly, and numerous others. These formal and informal observational

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assessments of interaction provide critical information with respect to the extent, quality, and style of engagement that children display when interacting with identifiable features in their social and physical environment.

When combined with information obtained from longer-term associations between these environmental factors and children's development as assessed with respect to their developmental resources (e.g., cognition, language) or organizational processes (e.g., emotion regulation, executive function), as well as their overall social and cognitive competence displayed in everyday situations as identified in the characterization phase of the Translational Research cycle, vital information that can guide the design of corresponding intervention targets and strategies is generated. For example, studies examining the association between the language development of defined groups of vulnerable children and the characteristics of parental language input (e.g., responsivity, expansions), combined with observations based on carefully defined comparison groups, can generate hypotheses with respect to potential intervention targets by adults capable of promoting child language (e.g., Landry, Taylor, Guttentag, & Smith, 2008; Warren & Brady, 2007).

Based on these systematic and comprehensive observations, intervention targets or strategies (e.g., enhancing follow-on comments during parent-child social communicative exchanges) are generated that vary along many dimensions, particularly their scope (focused, comprehensive). Here care must be taken to specify the parameters, especially broader goals, of the intervention and to provide sufficient details with respect to the approach (manualizing) to allow replication. Often accompanying the intervention strategies and broader goals (which may be

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part of a detailed manual) is a theory of change describing how child development might best be facilitated and how the intervention targets and strategies selected are consistent with the theory of change.

What follows in the next stage is a carefully considered process in which early trials are indicated. Single subject designs are particularly valuable in that they describe carefully articulated intervention targets and closely monitor changes in targeted behaviors over time. Despite small and restricted samples, suggestions regarding causal influences can be made as is also the case for small-scale systematic trials that include appropriate comparison or control groups. Many variations of these early trials, including integrating strategies into a larger array based on prior work, may be conducted before embarking on larger-scale studies.

In the final phase of the cycle, conducting and evaluating more sophisticated and demanding major trials are carried out, assuming early trials have found sufficient justification for doing so. Ideally, these are randomized clinical trials (RCTs). Depending upon the situation, major trials may be highly focused such as those designed to promote children's joint attention, or constitute a more comprehensive intervention attempting to influence numerous components of children's developmental resources and organizational processes. Comprehensive interventions generally are based on many prior intervention observational studies, longer-term association studies, and prior early trials. They are then integrated within a single framework. These research studies are usually carried out with extensive resources, including highly trained staff. As such, they serve as efficacy studies, demonstrating what can be accomplished under well controlled conditions to allow inferences about the causal nature of the environmental manipulations under

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investigation. Moreover, many initially highly controlled and resource rich studies have been applied under less controlled settings with more limited resources, often with more diverse populations in order to determine their degree of generalizability. These effectiveness studies provide vital information when considering applications to community-based systems. Of importance, as discussed in the section on the Developmental Systems Approach, most contemporary observational studies and the interventions that follow have generally been guided by conceptual models and empirical findings obtained from developmental science generated in the context of normative child development.

This Translational Research Cycle has indeed operated as indicated in Figure 1 in the early intervention field, resulting in numerous focused and comprehensive interventions for heterogeneous or well defined subgroups of vulnerable children and their families. The process is often not a linear one but does capture the various stages that can help organize our research literature with an eye to practice applications.

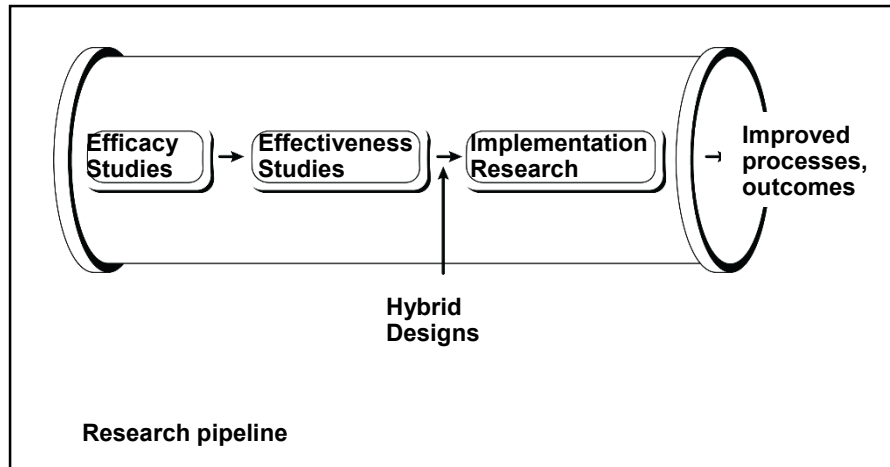
Admittedly, the expense and complexity of RCTs in particular in efficacy studies have limited their replication and extension to groups not initially the focus of the research group. Other designs (e.g., regression discontinuity designs), although weaker in their ability to generate firm causal statements about intervention effectiveness have nevertheless contributed considerably to intervention science and allowed further assessments of the degree confidence of available interventions. Together, these major studies constitute the vital evidence base for early intervention that has relied on the talents of numerous investigators over the years, providing the foundation for translating those findings to community settings and

establishing a conceptually sound and effective set of early intervention practices. However, the question mark following "practice applications" in Figure 1 suggests that this constitutes a highly complex task.

What to Implement in Practice

Figure 2 provides a general perspective of a process that can be drawn upon by communities designing or enhancing their early intervention systems. Referred to as a research pipeline (see Curran, Bauer, Mittman, Pyne, & Stetler, 2012), the movement from efficacy research, to effectiveness research, and then to implementation research is made explicit. Hybrid designs which combine different aspects of the research pipeline have been suggested as well, with some efforts to evaluate how they might work in early intervention studies (e.g., Shire et al., 2016). The questions then for community programs interested in designing or enhancing a comprehensive early intervention system for diverse groups of vulnerable children is what to apply in practice.

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Representation from: Curran, G. M., Bauer, M., Mittman, B., Pyne, J. M., & Stetler, C. (2012). Effectiveness-implementation hybrid designs. *Medical Care*, 50, 217-226. doi: <http://dx.doi.org/10.1097/MLR.0b013e3182408812>.

Figure 2. Research pipeline to enhance community-based early intervention programs.

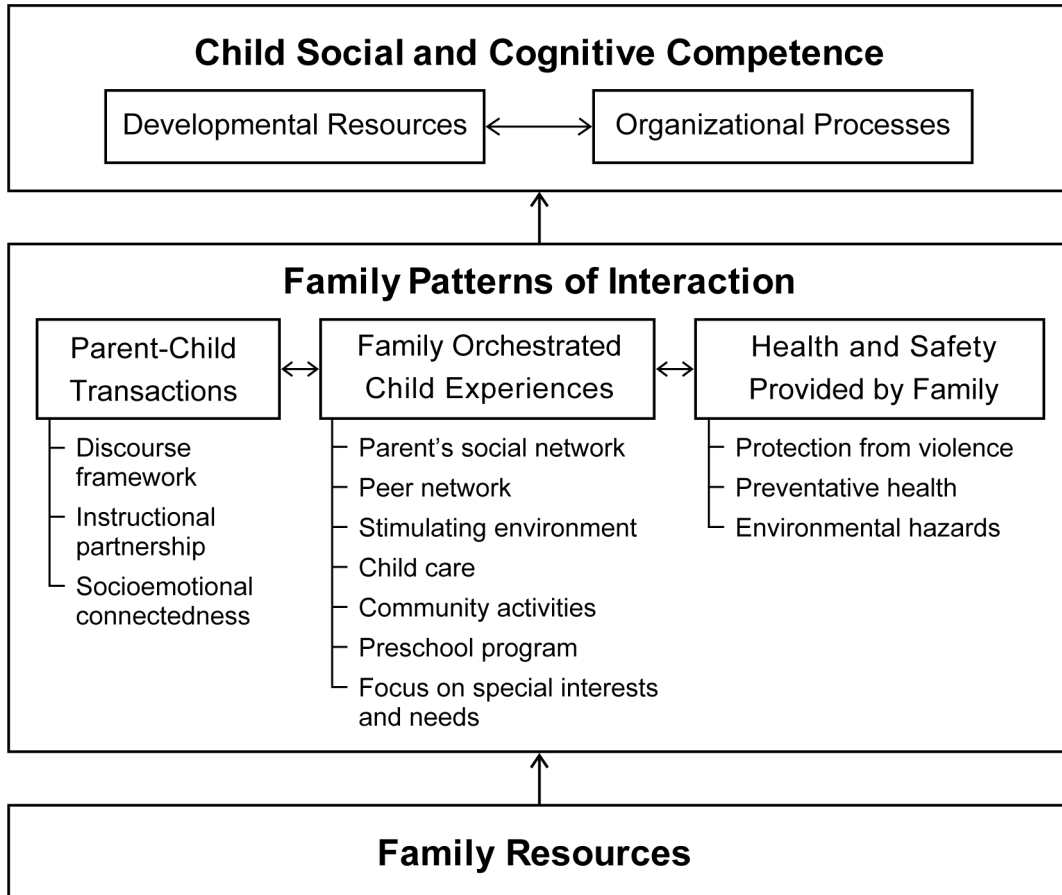
As suggested earlier, the absence of a common conceptual framework to analyze, evaluate, and organize the body of efficacy and effectiveness research in order to generate actual practices makes it extremely difficult for communities to decide not only "how to implement" (i.e., implementation science) but "what to implement". There is so much information to choose from generated by intervention science that some conceptual filter can be of enormous value especially when considering inclusive and comprehensive community-based early intervention systems. The "what to implement" falls within the province of the interaction among developmental science, our knowledge of risk and disability, and intervention science. Accordingly, in the following section of this chapter the framework provided by the Developmental Systems Approach is discussed in the context of providing guidelines for communities to determine which evidence-based curricula, programs,

or strategies to select in order to create a truly comprehensive early intervention system that is well-grounded conceptually and empirically.

The Developmental Systems Approach

The central hypothesis of the Developmental Systems Approach (DSA) is that optimum child development will occur when a family's patterns of interaction are optimal. Figure 3 identifies the 13 components of family patterns of interaction organized with the three domains of parent-child transactions, family orchestrated child experiences, and health and safety provided by the family. Developmental science has indicated that each of these components is associated with children's social and cognitive competence likely operating through children's developmental resources and organizational processes. Intervention science has further suggested that many of these associations are causal in nature constituting meaningful developmental pathways (see Guralnick, 2011). The DSA's developmental pathways have been examined for key vulnerable groups consisting of children with developmental delays (Guralnick, 2005a, 2017a, 2017b), children at environmental risk (Guralnick, 2013), children at biological risk (Guralnick, 2012), and children with autism spectrum disorder (in preparation). Consequently, following the DSA, the selection of evidence-based interventions (both focused or comprehensive) by communities should be designed to enhance all the components of family patterns of interaction. Moreover, as these developmental mechanisms were derived from processes based on normative developmental science, this framework readily applies to fully inclusive programs as it suggests the appropriateness of the DSA to all children, irrespective of vulnerability.

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Adapted from "Why Early Intervention Works: A Systems Perspective", by M. J. Guralnick, 2011, *Infants & Young children*, 24, pp. 6-28. Copyright 2011 Lippincott Williams & Wilkens.

Figure 3. General model illustrating the key levels and components (interrelationships not shown).

Stressors and Risk Factors

Taking this argument one step further, as reviewed in the articles noted above for the various vulnerable populations, considerable evidence exists indicating that each of the 13 components of family patterns of interaction can be perturbed by child-specific characteristics. Although numerous examples of family resilience have

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been documented, it is nevertheless the case that children's characteristics related to their unevenness in development, overall developmental delays, difficulty establishing social communication with others, and the relative lack of initiations with the social and physical world are among the many possible child characteristics associated with vulnerable populations that pose challenges to families to optimize family patterns of interaction (Spiker, Hebbeler, & Mallik, 2005). That is, child-specific characteristics create stressors to family patterns of interaction including components associated with parent-child transactions as well as family orchestrated child experiences and providing for the child's health and safety (see Figure 3). Societal constraints with respect to acceptance and accommodating to children's specific developmental problems further constrain learning opportunities.

Preexisting risk factors at the level of family resources can also influence all of the components of family patterns of interactions (see Figure 3). Risk factors in the domain of personal characteristics of the family (e.g., parent mental health, coping style) as well as the domain of material resources (financial resources, social support) often co-occur, tending to create a high level of cumulative risk (Evans, Li, & Whipple, 2013).

Compounding this further is that many child-specific characteristics noted above associated with vulnerable groups can also influence family resources, creating stressors at that level. This combination adds a further burden to providing optimally supportive family patterns of interaction. Accordingly, careful analysis of each component of family patterns of interaction and factors influencing each component is an essential feature of early intervention systems, as enhancing the

quality of each component of family patterns of interaction constitutes the central goal of early intervention within the DSA framework.

DSA Principles

The DSA further suggests that the design of early intervention systems should adhere to the following three principles: relationships, comprehensiveness, and continuity. The formation of relationships is particularly critical for the parent-child transaction domain of family patterns of interaction but extends to relationships with other adults in the family's social network, teachers, and numerous others in regular contact with the child. High quality parent-child relationships in particular begin with a pattern of parent sensitive-responsiveness, affective warmth, and engagement with the child which ultimately coalesces into a true relationship characterized by shared expectations and a shared psychological state (Tomasello & Carpenter, 2007). As discussed later, such relationships are also critical between early intervention professionals and parents as part of family-centered practices.

Further guidance by the DSA is provided by the principle of comprehensiveness. In this context it refers to the importance of addressing all components of family patterns of interaction to maximize child development. When doing so, information about the characteristics of the child or risk factors for family resource components is accessed when engaging in a problem-solving process for each component of family patterns of interaction. Direct intervention with respect to components at those levels is often warranted as well, but the focus on family patterns of interaction should remain. When available, etiologic-specific information on developmental patterns also can provide the intervention team with useful

guidance. Similarly, the principle of continuity represents the reality that early intervention systems must be designed to be vigilant with respect to the changing needs of families and children that inevitably emerge over time.

Intervention Process

The rich literature in the field of early intervention indicates that screening and assessment tools in one form or another are available for virtually all of the components of family patterns of interaction. As the intervention process develops, information from the components of family patterns of interaction is combined with information at the level of the child and the level of the family to form the basis for the family and professional team to address crucial problems designed to enhance specific components of family patterns of interaction. Broad functional goals are established, and curricula and related intervention strategies are selected based both on the evidence available and its compatibility with the DSA framework. This is an important stage in the early intervention process, as it is at this juncture that the DSA serves as a filter for the evidence-based information available and links it to one or more of the 13 family patterns of interaction. It therefore contributes to identifying "what to implement" discussed earlier.

Once this occurs, more specific, short-term objectives are then established along with corresponding activities designed to occur in the context of family routines or as part of activities in environments selected by the family (e.g., an inclusive child care, community programs). Bearing in mind the importance of relationships in particular, the degree of structure and the integration of behavioral and developmentally- oriented activities are also determined as part of an overall

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problem-solving process by the family and professional team. Relevant measurement techniques that have been developed that are not burdensome can then be implemented. These techniques highlight the extent to which progress is being achieved within this framework.

Although each goal remains focused on enhancing components at the level of family patterns of interaction, intervention approaches include an awareness of specific child characteristics to enable appropriate accommodations to be made that promote one or more of the components of family patterns of interaction. Similarly, attention to the strengths and constraints that exist at the level of family resources clearly enters into the problem-solving process. Addressing family resources is often a highly sensitive matter (may involve family relationships), sometimes difficult (may need to address parent mental health problems), or seem intractable (chronic poverty). Under many circumstances, direct engagement at the level of family patterns of interaction may be most productive while efforts are underway to strengthen family resources over the long-term in order to substantially reduce risk factors that influence components of family patterns of interaction. Moreover, resources that require expertise beyond that of the professional team may be identified or a lack of availability of resources sufficient to address an important component of family patterns of interaction may be recognized. As such, this process can serve as a catalyst for generating policies within the early intervention system that foster strategic connections with service sectors that are relevant. In many respects, the DSA can serve to help expand and enhance the quality of the early intervention system through policy initiatives well grounded in developmental and intervention science (Guralnick, 2015).

Family-Centered Practices

The DSA constitutes a framework that can be used by communities to design an early intervention system and provides a clear direction for implementation processes. It is linked to developmental science, providing conceptually and empirically based developmental mechanisms organized in the context of each of the components of family patterns of intervention. Support for the proposed developmental mechanisms within and across levels of the DSA and diverse groups of vulnerable children and families is also available. Guiding principles assist not only with the problem solving process associated with individual children and families but also help communities decide "what to implement". Once that is established, the demanding process of "how to implement" relying on implementation science takes its course.

It is essential to highlight as well that, by its very nature, the DSA is an approach that centers on families; i.e., its focus is to enhance family patterns of interaction. To do so successfully, however, requires attention to another set of principles that guides the nature and quality of interactions between families and the team of professionals. To be sure, partnerships are the key and professionals themselves must be flexible in interacting with one another to recognize the contributions of all team members and often extend themselves beyond disciplinary barriers as part of the overall problem solving process. It is the intention of the DSA to facilitate these collaborations as each discipline applies their expertise to the task of enhancing one or more of the components of family patterns of interaction. This is a collaborative effort requiring a broad knowledge of child development along with a commitment to developing professional partnerships designed to meet child and

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family needs through supporting as optimal family patterns of interaction as possible. When this occurs, the conditions for optimal child development exist.

The partnership with families requires even greater awareness that all involved are engaged in a participatory process, with special attention given to family priorities. The result of this effort takes the form of "help-giving practices" (Dunst & Trivette, 2009); interactions which require building honest, respectful relationships with families to provide support in a manner that enables the families themselves to best support their child (see Dunst, 2017). As is the case when considering child-specific characteristics, building on family strengths and accommodating to constraints is an ideal formula for ultimately enhancing components of family patterns of interaction.

Moreover, the ability of professionals and families to form partnerships has the potential to strengthen in direct and, perhaps more often, in indirect ways the various DSA components at the level of family resources. The enabling feature surrounding these relationships is clear particularly with respect to parents' ability to solve problems when difficult situations arise and to be staunch advocates for their child (see Dunst & Espe-Sherwindt, 2016). A key point here is that these relationships and partnerships can be both emotional and difficult. However, if all parties involved are aware of and adopt a common conceptual framework such as the DSA, a common language, and a common set of developmentally-sound goals, the clarity of communication and the quality of early intervention programs are likely to be at high levels.

Conclusions

The demonstrated effectiveness of early intervention for vulnerable children and their families in general has encouraged communities to develop formal, inclusive, and comprehensive early intervention systems. Implementation science is clearly relevant and the Translational Research Cycle for generating evidence-based interventions with varying degrees of confidence and relevance to different vulnerable groups provide important insights into the content and design of such comprehensive systems. The question as to "how to implement" these research findings in community programs remains a critical but difficult and vexing problem, one that has not received adequate attention from systems developers in the field of early intervention. Yet, given the diversity, complexity, and even uncertainty of research findings encompassing both efficacy and effectiveness approaches, "what to implement" in a comprehensive system can and must be addressed first in a thoughtful and consistent way. Appropriate implementation approaches can then follow.

It is suggested in this chapter that to do so effectively, community program developers must consider and adopt a conceptual framework and all that is implied to guide the selection of intervention approaches for diverse groups of children and families. The DSA was suggested as one such framework. As described, it is based on developmental science that has relevance to all children irrespective of vulnerability, takes into consideration our knowledge of the developmental and behavioral patterns of children at risk and those with established delays or disabilities, and is consistent with available intervention science. Overarching principles of relationships, comprehensiveness, and continuity provide additional

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guidance to the problem-solving intervention process that focuses on enhancing the quality of the components of family patterns of interaction. The latter constitute key developmental mechanisms that promote child development embedded in a complex, reciprocal set of interrelationships involving child-specific characteristics and family resources. Moreover, the DSA requires a firm and thoughtful application of family-centered practices requiring teamwork and partnering with families throughout all phases of the intervention process.

Further research evaluations of the validity of the influences postulated to exist as part of the DSA within and among all levels are certainly needed. But as that occurs, there appears to be sufficient evidence, both conceptual and empirical, to suggest that the DSA can serve as a useful organizational framework for the design, implementation, evaluation, and refinement of comprehensive community-based early intervention systems for vulnerable children and their families.

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