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Response to Intervention and the Pyramid Model

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Response to Intervention (RtI) offers a comprehensive model for the prevention of delays in learning and behavior. While this problem-solving framework was initially designed for application within Kindergarten to 12th grade programs, there is substantial research that supports the value of the model for application within early childhood programs. This paper provides an overview of RtI and discusses the Pyramid Model (Fox, Dunlap, Hemmeter, Joseph, & Strain, 2003) and its ***application*** for promoting young children's social competence and preventing behavior challenges. This discussion is offered by the Technical Assistance Center on Social Emotional Intervention (www.challengingbehavior.org) to provide guidance to early childhood professionals and program administrators as they develop policies and procedures related to the adoption of RtI.

Response to Intervention (RtI) is a systematic decision-making process designed to allow for early and effective responses to children's learning and behavioral difficulties, provide children with a level of instructional intensity matched to their level of need and then provide a data-based method for evaluating the effectiveness of instructional approaches.

What is RtI?

Response to Intervention (RtI) is a systematic decision-making process designed to allow for early and effective responses to children's learning and behavioral difficulties, provide children with a level of instructional intensity matched to their level of need and then provide a data-based method for evaluating the effectiveness of instructional approaches. RtI relies on evidence-based instructional practices and frequent progress monitoring to provide the data necessary to make decisions about child progress and the need for more intensive intervention. The model is intended to reduce unnecessary referrals to special education by ensuring that all children in the general education setting have access to high quality curriculum and instruction that are provided in a cascade of intensity, and that each child receives a level of instructional intensity matched to his/her level of need. The model is not intended to replace special education and its procedural safeguards.

RtI was introduced as special education policy in the Individuals with Disabilities Education Improvement Act of 2004 (IDEA 2004). It has its conceptual roots in applied behavior analysis, precision teaching, diagnostic prescriptive teaching, curriculum-based measurement, pre-referral intervention, data-based decision making and team-based problem solving (Sugai, 2007).

Critical Features of RtI

RtI is based on the premise that supports are provided early, monitored systematically, and adjusted intentionally to respond to individual children's needs, thus preventing the more traditional practice of waiting for a child to demonstrate failure and then beginning a process of evaluation and referral to special education. Instead, RtI includes several features that allow programs to more quickly and efficiently provide the type of support children need to demonstrate successful outcomes. These features include the following:

1. **Universal screening:** In RtI approaches, the performance of all students is evaluated systematically to identify those who are (a) making adequate progress, (b) at *some* risk of failure if not provided extra assistance, or (c) at *high* risk of failure if not provided specialized supports.

2. **Continuous progress monitoring:** In RtI approaches, student progress is assessed on a regular and frequent basis in order to identify when inadequate growth trends might indicate a need for increasing the level of instructional support to the student.

3. **Continuum of Evidence-Based Interventions:** RtI approaches assume multiple levels, or a "cascade," of interventions that vary in intensity or level of support derived

from scientifically validated research. Typically a *core* curriculum is provided for all students, *modification of this core* is arranged for a targeted group of students who do not show adequate growth in response to the core curriculum, and an *individualized intensive curriculum* is implemented for students who do not show adequate growth in response to the modified curriculum.

4. **Data-based decision making and problem solving:** At the heart of the RtI approach is instructional decision-making based on student performance or growth on curricular outcomes and modifications or adaptations that are implemented when insufficient growth is noted.

5. **Implementation Fidelity:** RtI requires specific procedures for regular documentation of the level of implementation (e.g., were the modifications of the teaching practices implemented consistently and with a high degree of accuracy) of each of the features of the model.

Research Support for RtI?

While numerous studies have been carried out to validate the specific features of RtI, the evidence base establishing the effectiveness of various models or approaches to RtI is still emerging (Hughes & Dexter, 2008; Torgeson, 2009; VanDerHeyden, Witt, & Gilbertson, 2007). Available evidence indicates that use of RtI models can improve the academic performance of at-risk students most notably in the area of early reading skills (e.g., O'Connor, Harty & Fulmer, 2005; Vaughn, Linan-Thompson, & Hickman, 2003). Other studies have shown that students who were involved in programs employing RtI models had reduced rates of special education referral and/or placement (e.g., Bollman, Silberglitt, & Gibbons, 2007; Marston, Muyskens, Lau, & Canter, 2003; O'Conner et al., 2005), or performed better on academic behaviors such as time-on task and task completion (Kovaleski, Gickling, Morrow, & Swank, 1999).

Expansion of RtI to Social/Behavior

Although most studies of RtI have focused on instructional practices in academic areas, some applications of RtI have been reported in the area of instructional support for social behavior, such as School-wide Positive Behavior Support (Sugai et al., 2000). RtI models focusing on academic instruction or support for social behavior share an emphasis on prevention and both types of models have created tiered approaches that have their roots in public health (e.g., Simeonnson, 1994). As Sugai (2001) has described, 3-tier models that are implemented in academic systems or behavioral systems are based on the following components:

1. **Primary tier prevention** with all students being exposed to a core curriculum to prevent later problems. Regular screening identifies students who are unsuccessful in response to instruction with only the core curriculum.

2. **Secondary tier prevention** that is targeted to at-risk students who need some additional instructional support beyond the core curriculum.

3. **Tertiary tier prevention** that is generally more intensive and individualized and is carried out to remediate academic performance or reduce complications or severity of problem behavior.

A critical component underlying the three tiers of instructional support are clear decision rules based on student performance that determine when a student moves up or down the continuum of tiers. Therefore, in either academic or social systems using an RtI approach, the focus is on timely screening, ongoing progress monitoring, and data-based decisions so that more effective interventions can be provided for students whose academic or social behaviors are not responsive to the core curriculum and more intensive interventions (Sugai, 2007). Preventing academic failure and challenging behaviors is the underlying premise of RtI so that all students' learning is maximized.

Applying RtI in early education: *The Pyramid Model*

RtI has pragmatic appeal for early education as it is consistent with the conceptual and theoretical framework of early childhood special education and national recognition of the critical importance of high quality early childhood programs to promote young children's development (Coleman, Buysse, & Neitzel, 2006; VanDerHeyden & Snyder, 2006). Early childhood special education was developed as a prevention model with an emphasis on the importance of providing intervention and supports to very young children and their families to minimize the impact of disability, risk, or developmental delay on the child's developmental trajectory and learning outcomes (Simeonnson, 1991). Similarly, Head Start, Early Head Start, Title I Preschool, and state-funded preschool programs have been developed in response to the overwhelming research on the benefit that can be realized when young children attend high quality early education programs or receive intervention services to address child and family needs (Guralnick, 1997; 2005; Ramey & Ramey, 1998). The common focus across current early childhood initiatives is the provision of early education, intervention, and family support that will prevent future academic challenges and developmental delays or disabilities (VanDerHeyden & Snyder, 2006).

In early childhood programs, an RtI model offers a framework for ensuring the delivery of high quality education and care at

the universal level to support the development of all children and a process for determining how to identify and assist young children in need of additional intervention to ensure their developmental progress (Coleman et al., 2006; Greenwood, Carta, Baggett, Buzhardt, Walker, & Terry, 2008). A tiered intervention model is an excellent fit with the presumption in early childhood and early intervention that young children should be educated within natural environments and inclusive settings and that intervention should be designed to match child and family needs.

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The identification of the research-based curriculum and interventions that can be arranged into a tiered model of intervention approaches matched to child intervention needs is essential to the design of a RtI model. The need for an intervention framework for addressing young children's social and behavioral concerns is supported by a substantial body of research that illustrates the detrimental effects of social emotional delay and challenging behavior on children's school achievement and developmental outcomes. In early childhood, the Pyramid Model (Fox et al., 2003) has been identified as a tiered intervention model that provides guidance for the design and delivery of evidence-based interventions to promote the social development of young children and provide more intensive intervention for children who have social-emotional delays or behavioral challenges. This model is described below followed by a discussion about the adoption and implementation of the model as a RtI process.

The Tiered Framework of the Pyramid Model

The Pyramid Model (*Figure 1*) provides a tiered intervention framework of evidence-based interventions for promoting the social, emotional, and behavioral development of young children (Fox et al., 2003; Hemmeter, Ostrosky, & Fox, 2006). The model describes three tiers of intervention practice: universal promotion for all children; secondary preventions to address the intervention needs for children at risk of social emotional delays, and tertiary interventions needed for children with persistent challenges. The Pyramid Model was initially described as an intervention framework for children 2-5 years old within early childhood settings. However, newer iterations of the model provide guidance for the implementation of the framework with infants, toddlers and preschoolers, and include interventions needed to support children who are typically developing and who have or are at risk for developmental delays or disabilities (Hunter & Hemmeter, 2009).

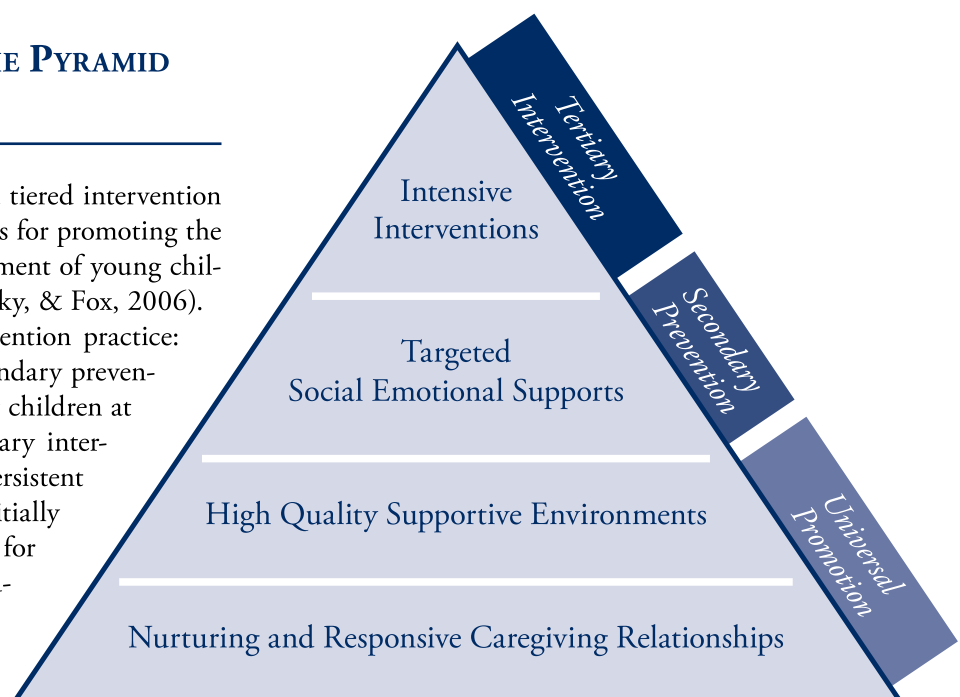

Figure 1. Pyramid Model

Tier 1: Universal Promotion. The first tier of the Pyramid Model involves two levels of practices that are critical to promoting the social development of young children. The first level of practices is the provision of nurturing and responsive caregiving relationships to the child. This includes the family or primary caregiver and the caregiver or teacher within an early childhood program. In addition to a focus on the relationship to the child, this level of the pyramid also describes the need for developing partnerships with families and collaborative relationships among intervention or classroom team members.

There is ample evidence that the provision of a responsive and nurturing relationship is pivotal to a child's development (National Research Council, 2001; Shonkoff & Phillips, 2000). In their early years, children exist within a web of relationships with parents, teachers, other caring adults in their lives and eventually, peers. This web supplies the context within which healthy social emotional growth and the capacity to form strong positive relationships with adults and peers develop. The relationships level of the pyramid model includes practices such as: actively supporting children's engagement; embedding instruction within children's routine, planned, and play activities; responding to children's conversations; promoting the communicative attempts of children with language delays and

disabilities; and providing encouragement to promote skill learning and development.

The second level of universal promotion is the provision of supportive environments. Within home and community settings, this level of the pyramid refers to the provision of predictable and supportive environments and family interactions that will promote the child's social and emotional development. Universal practices for children with or at risk for delays or disabilities include receiving instruction and support within inclusive environments that offer the rich social context that is essential to the development of social skills and peer relationships.

In early care and education programs, this level of the pyramid refers to the design of classrooms and programs that meet the standards of high quality early education. This includes the implementation of a curriculum that fosters all areas of child development, the use of developmentally and culturally appropriate and effective teaching approaches, the design of safe physical environments that promote active learning and appropriate behavior, the provision of positive and explicit guidance to children on rules and expectations, and the design of schedules and activities that maximize child engagement and learning. At this level of the pyramid, families who receive early intervention services might be provided with information and support on establishing predictable routines; implementing specialized health care and treatment procedures; teaching social, emotional, and other skills within play and routine activities; promoting language and communication development; and fostering the development of play and social interaction skills.

Tier 2: Secondary Prevention. The secondary or prevention level of the Pyramid includes the provision of explicit instruction in social skills and emotional regulation. In early childhood programs, all young children will require adult guidance and instruction to learn how to express their emotions appropriately, play cooperatively with peers, and use social problem solving strategies. However, for some children it will be necessary to provide more systematic and focused instruction to teach children social emotional skills. Children might need more focused instruction on skills such as: identifying and expressing emotions; self-regulation; social problem solving; initiating and maintaining interactions; cooperative responding; strategies for handling disappointment and anger; and friendship skills (Denham et al., 2003; Joseph & Strain, 2003; Strain & Joseph, 2006). Families in early intervention programs might need guidance and coaching from their early intervention provider on how to promote their child's development of targeted social and emotional skills. Families of infants and young toddlers might need guidance and support for helping the very young child regulate emotions or stress and understand the emotions of others.

Tier 3: Tertiary Interventions. When children have persistent challenging behavior that is not responsive to interventions at the previous levels, comprehensive interventions are developed to resolve problem behavior and support the development of new skills. At this level of the Pyramid Model, Positive Behavior Support (PBS) is used to develop and implement a plan of intensive, individualized intervention. PBS provides an approach to addressing problem behavior that is individually designed, can be applied within all natural environments by the child's everyday caregivers, and is focused on supporting the child in developing new skills (Dunlap & Fox, 2009; Lucyshyn, Dunlap, & Albin, 2002).

The process begins with convening the team that will develop and implement the child's support plan. At the center of the team is the family and child's teacher or other primary caregivers. The PBS process begins with functional assessment to gain a better understanding of the factors that are related to the child's challenging behavior. Functional assessment ends with the development of hypotheses about the functions of the child's challenging behavior by the team. These hypotheses are used to develop a behavior support plan. The behavior support plan includes prevention strategies to address the triggers of challenging behavior; replacement skills that are alternatives to the challenging behavior; and strategies that ensure challenging behavior is not reinforced or maintained. The behavior support plan is designed to address home, community, and classroom routines where challenging behavior is occurring. In this process, the team also considers supports to the family and strategies to address broader ecological factors that affect the family and their support of the child.

Key assumptions of the Pyramid Model

The Pyramid Model was designed for implementation by early educators within child care, preschool, early intervention, Head Start, and early childhood special education programs. In the delivery of tier 2 and 3 interventions, it is assumed that programs will need to provide practitioners with support from a consulting teacher or specialist in the identification of individualized instructional goals and the design of systematic instructional approaches or behavior support plans. The framework was not designed as a path to special education services. Instead, the Pyramid Model provides a comprehensive model for the support of all children. A child receiving services through special education might be served at any of the intervention tiers. The model was designed with the following assumptions related to implementation:

1. **Inclusive social settings are the context for intervention:** The focus of the Pyramid Model is to foster social emotional development. This requires a rich social milieu as the context of intervention and instruction. Thus, the model is designed for implementation within natural environments, interactions with the child's natural caregivers and peers, and classroom settings that offer opportunities

for interactions with socially competent peers. Interventions do not involve pull out from those settings; rather, they are dependent on a rich social context where the number of opportunities to learn and practice social skills can be optimized.

2. **Pyramid model tiers have additive intervention value:** Each tier of intervention builds upon the previous tier. Tier 2 and 3 interventions are reliant on the provision of practices in the lower tiers to promote optimal child outcomes.

3. **Instructional precision and dosage increases as you move up the Pyramid tiers:** The intervention practices and foci in tier 2 and 3 are not uniquely different teaching targets or approaches than the universal practices used to foster all children's social development. The differences between tiers are evident in the specificity of the instructional target, the precision of the instructional approach, the frequency of monitoring children's responsiveness to intervention efforts, and the number of instructional opportunities delivered to children at each level.

4. **Efficiency and effectiveness of intervention is of primary importance:** When children have challenging behavior or social-emotional risks, it is imperative that intervention is delivered quickly and effectively. There is ample research evidence that when children's challenging behavior persists, the problems are likely to worsen and become compounded by related problems including peer and adult rejection and coercive relationships (Dodge, Coie, & Lynham, 2006; Moreland & Dumas, 2008). Thus, the Pyramid model has been provided to early educators so that practitioners and programs can provide the most effective intervention needed to immediately support the child and result in desired child outcomes. Children in need of tier 2 or tier 3 approaches should have immediate access to those interventions.

5. **Families are essential partners:** The interventions involved in the Pyramid Model are reliant on the participation of families. All families are provided with information on how to promote their child's social development. When children are in need of tier 2 or 3 interventions; families are involved in the provision of systematic intervention by providing increased opportunities for the child to learn and practice new skills in the context of everyday activities and routines in the home and community. When children have persistent challenges, families and other persons involved with the child form a collaborative team to develop and implement comprehensive interventions and supports that are applied in all of the child's routines and activities.

The Pyramid Model has been widely disseminated by two federally-funded research and training centers (i.e., Center on the Social Emotional Foundations for Early Learning {www.vanderbilt.edu/csefel} and the Center on Evidence-Based Practices: Young Children with Challenging Behavior now funded as the Technical Assistance Center on Social Emotional Interventions for Young Children {www.challengingbehavior.org}). In the last several years, faculty members from these Centers have been involved in assisting states and programs with program-wide adoption of the Pyramid Model (Fox & Hemmeter, 2009; Hemmeter, Fox, Jack, & Broyles, 2007). In addition, tools have been developed to support the implementation of the Pyramid model including: an implementation fidelity tool to assess a teacher's implementation of these practices, implementation materials to support teachers in using the practices, and the identification of the professional development approaches needed to support teachers in achieving fidelity (Hemmeter, Fox, & Snyder, 2008).

Program-wide adoption of the Pyramid Model brings the Pyramid Model into a systematic, problem-solving process that allows for the identification of children who are in need of more focused or intensive intervention and the use of data to monitor child progress and outcomes. Program-wide adoption of the pyramid offers an appropriate model of an RtI process for young children's social and behavioral development.

The Pyramid Model as an RtI

The Pyramid Model was developed in 2003 in an effort to articulate, disseminate, and train practitioners on the evidence-based practices involved in each of the tiers. In addition to offering a continuum of evidence-based interventions to promote social development and address challenging behavior, the Pyramid Model includes procedures that meet the critical components of the RtI process. A central element of the RtI process is the use of universal screening and progress monitoring data to identify children who are at-risk of developmental delays and to ensure that children are progressing in response to instruction. In the adoption of the Pyramid Model, universal screening is used to identify children who might have social-emotional delays and are in need of more systematic supports or instruction. Screening tools, such as the Ages and Stages Questionnaires: Social-Emotional (Squires, Bricker, & Twombly, 2002) or a similar instrument offer an efficient mechanism to identify children who might need further assessment, closer monitoring, or more intensive intervention. In addition to using a universal, standardized screening measure to identify children

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who might need additional support, programs systematically monitor challenging behavior incidences to determine if an individual child or teacher might need more support or need additional intervention.

The results of universal screening (e.g., Squires et al., 2002) paired with additional data on incidents of challenging behavior will provide the program with information to identify children who might be in need of tier 2 or tier 3 levels of intervention. Children who have social-emotional delays, who struggle with meeting developmentally appropriate social and behavioral expectations, or who have chronic but mild forms of problem behavior should be provided with systematic instruction focused on the development of targeted social emotional skills. Children whose persistent challenging behaviors interfere with their participation in daily activities or cause harm to themselves or others are children who are targeted immediately for tier 3 interventions.

Children who have social-emotional delays, who struggle with meeting developmentally appropriate social and behavioral expectations, or who have chronic but mild forms of problem behavior should be provided with systematic instruction focused on the development of targeted social emotional skills.

Tier 2 interventions involve the development of an intervention plan and progress monitoring system for children who need targeted social emotional intervention to prevent the development of challenging behavior or remediate social emotional delays. The intervention plan includes: identifying the specific social-emotional skill or skills that are targeted for intervention; specifying the individualized instructional approach or prompting system that will be used; ensuring that sufficient instructional and practice opportunities will be delivered to the child; and developing an efficient method for collecting meaningful data on the child's responsiveness to intervention.

Tier 3 intervention involves the implementation of an assessment-based behavior support plan to address the environmental triggers of challenging behavior, provide instruction of communication and social skills that serve as replacement to challenging behavior, and to ensure that new skills are being reinforced and problem behavior is not being maintained by events or interactions with others. The behavior support plan is facilitated by a behavior specialist or mental health consultant (or another professional with expertise in behavioral interventions) who convenes a team that includes the classroom teacher and family. The behavior support team works together through the process of functional assessment and the design of the behavior support plan. In addition, an easy-to-use progress monitoring chart is developed to track the responsiveness of the child to the behavior support plan. This typically takes the form of a data collection system that is used every few days and provides information on the child's use of the targeted replacement skill or prompting level needed to support the use of the skill and data on the severity or frequency of the child's engagement in the challenging behavior targeted for reduction. Tier 3 intervention also includes the development of a procedural fidelity checklist that is used to ensure that all components of the behavior support plan are being implemented as intended.

A critical element for RtI is implementation fidelity. The Teaching Pyramid Observation Tool (TPOT) has been developed to assess the teacher's capacity to deliver the tiered model of intervention practices (Hemmeter et al., 2008). It is used as a professional development tool to identify the teaching practices that are in place and areas of focus for training, coaching, and implementation the child's progress in responding to the intervention. An important feature of the TPOT is that it can be used as an implementation fidelity measure to assess if the universal tier of practices is in place and delivered to the classroom as a group. However, when an intervention is delivered to an individual child, there must be a measure to determine if interventions at Tiers 2 and 3 are delivered with intended precision and intensity. This type of implementation fidelity requires that a simple data collection mechanism be developed to track the delivery of instruction or intervention at tiers 2 and 3 as well as the child's progress in responding to the intervention.

The adoption of the Pyramid Model as an RtI within an early childhood program requires an infrastructure of systems and supports to ensure that practitioners can implement the model with fidelity and that the model becomes fully integrated into the program (Fox & Hemmeter, 2009; Hemmeter et al., 2006). Infrastructure features that support the implementation of an RtI include: 1) the development of clear procedures for screening, progress monitoring, and the delivery of more intensive tiers of intervention to children; 2) the development of strategies and systems for family involvement within each tier; 3) professional development and ongoing support to teachers for implementation fidelity; 4) access to expertise in the design and implementation of tier 2 and tier 3 interventions; and 5) procedures for efficient and meaningful data collection and data-based decision-making.

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Toward a Comprehensive and Optimal Implementation of RtI

Although RtI is clearly a promising model for prevention and data-based problem solving, and although the Pyramid Model addresses the promotion of healthy social-emotional development and the prevention of challenging behavior in a manner that is highly compatible with RtI, there are issues in need of further development and research in order for the approaches to be implemented easily and effectively in the full array of early childhood programs. The following section addresses these issues.

A first concern involves the status of evidence-based practices that can be implemented with confidence to prevent or remediate challenging behaviors. The effectiveness of the Pyramid Model and RtI for social-emotional behaviors is dependent upon the demonstrated efficacy and efficiency of the strategies used at each tier of the hierarchy. At this point, there is considerable research available documenting the effects of intervention practices at tier 2 and tier 3 of the model (e.g., Dunlap & Fox, 2009; Hemmeter et al., 2006; Strain & Schwartz, 2009). However, there is much less research information with which to establish the preventive effects of tier 1 (primary prevention) strategies. The variables identified as essential tier 1 strategies, related to relationships and environmental arrangements, are derived from consensus documents and compelling indirect research findings (Birch & Ladd, 1998; Bodrova & Leong, 1998; Cox, 2005; Howes & Hamilton, 1992; Howes, Phillips, & Whitebrook, 1992; Howes & Smith, 1995; Kontos, 1999; National Research Council, 2001; Peisner-Feinberg et al., 2000; Phillips, McCartney, & Scarr, 1987; Pianta, Steinberg, & Rollins, 1995), but there is very little rigorous research that has directly tested the effects of these variables in promoting healthy social-emotional development and preventing the occurrence of challenging behaviors. Such research will be extremely valuable in determining the parameters of tier 1 strategies that are most efficient and effective.

Research is also needed to evaluate factors involved in facilitating implementation of the model in early childhood service programs (cf., Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). In particular, development of the model will benefit greatly from evaluation, correlational, and case study investigations focused on systems variables (e.g., administrative practices, policies, personnel preparation, and funding formulae) that contribute to fidelity and sustainability of the data collection, problem solving and procedural aspects of the approach. At this point, there are some very useful and encouraging examples of large-scale (program-wide) implementation (Fox, Jack, & Broyles, 2005; Hemmeter & Fox, 2009; Hemmeter, et al., 2007), but the need remains for more focused examinations to help refine the model's components and scale-up capabilities.

Finally, it is important to look at approaches to social-emotional development in the overall context of strategies for enhancing intellectual and academic development and readiness for school (kindergarten) for all children. In some respects, the application of RtI models to academic (e.g., literacy and numeracy) concerns has been studied more extensively than RtI applications to social, emotional and behavioral development. Ultimately, however, the approaches need to be integrated and considered as a comprehensive, interconnecting model addressing all aspects of optimal development of young children. Attainment of this goal will require a clear focus on the design of inclusive programs with a full appreciation for the needs of a diverse population of children, including children with multiple risk factors and a range of disabilities.

Summary

Response to Intervention (RtI) provides a useful, problem-solving framework that is highly compatible with the goals and priorities of early childhood education and early intervention. The Pyramid Model (Fox et al., 2003) is a multi-tiered model of prevention and intervention for healthy social-emotional development and the prevention of challenging behaviors. In this article, we have attempted to describe the close relationship between RtI and the Pyramid Model and to illustrate how the Pyramid Model can be viewed as a constructive application of RtI in the context of social, emotional and behavioral functioning. A major point of this discussion has been to emphasize the exciting promise of these approaches as we seek to improve the capacity of early childhood programs for preventing the serious consequences associated with challenging behavior and promoting healthy development for all young children.

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