Multi-Tiered Systems of Support and Evidence-Based Practices

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Inherent to a multi-tiered service delivery model is the provision of evidence-based, high-quality instruction and intervention to all students. EBPs refer to effective, research-based strategies and programs, including supplemental differentiated support, shown to produce positive outcomes (Forman et al. 2013; Novins et al. 2013). The term "evidence based" has been described in the educational and psychological literature as the level of evidence that supports the efficacy, generality, and use of a practice as indicated by research (Stoiber and DeSmet 2010). In general, the more specific term "evidence-based interventions," or EBIs, refers to prevention, intervention, or treatment programs having strong scientific support or research evidence (e.g., at least one published study using strong design features and demonstrated positive measured outcomes; Kratochwill and Stoiber 2002). EBPs are defined as practices that integrate the best available research with clinical expertise in the context of student characteristics, culture, and preferences. The term EBP is distinguished from the term EBI, in that an EBP may be based on (a) demonstrated research-based outcomes and/or (b) context-specific, data-based decision-making that incorporates data collected by the practitioner for progress monitoring or program evaluation purposes (Stoiber and DeSmet). At present, the term EBP is being used more frequently in the literature and corresponds to the language in current school reform policies. EBPs constitute an essential feature of successful implementation of MTSS.

Although a wide range of effective preventive and intervention EBPs has been developed for application in clinical settings, especially for addressing child and adolescent mental health, fewer have been evaluated within school-based settings. For example, Novins et al. (2013) conducted a review of empirical studies examining EBPs to improve mental health outcomes in children and adolescents. Just over one-third of the studies (36 % or 16 studies) identified by Novins et al. were determined to use a true experimental design such as including randomized control groups, with observational and descriptive studies being most common. Of the 16 studies found to meet their criteria for methodological rigor and relevance, only 25 % (4 of 16) were conducted in school settings. Interestingly, the majority of EBP studies meeting criteria, including school-based investigations reviewed by Novins et al., targeted substance abuse. Miller et al. (2009) performed a review of studies examining suicide prevention programs based on the *Evidence-Based Interventions in School Psychology Procedural and Coding Manual* (Kratochwill and Stoiber 2002). Their review found that only 2 of 14 school-based studies demonstrated significant positive

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statistical effects on the primary measures. In addition, less than a quarter (23%) of the studies identified the intervention components linked to the primary outcomes, and similarly few studies (23%) provided information regarding program implementation integrity. Miller et al. reported only one suicide prevention study (7.6%) provided promising evidence of educational/clinical significance. Clearly, more high-quality research is needed aimed at the development of EBPs, especially for addressing students' targeted mental health concerns.

Despite the need for continued development of EBPs, there are a number of empirically supported programs and strategies appropriate for application in school settings. Several groups have established criteria for reviewing the effectiveness of prevention and intervention programs and practices such as the *Promising Practices Network* (http://www.promisingpractices.net) and the federally funded *What Works Clearinghouse* 2007 (WWC; http://www.whatworks.ed.gov). For example, the *Promising Practices Network* offers descriptions of interventions aimed at improving academic difficulties (e.g., peer-assisted learning strategies; PALS) and for addressing social–emotional and behavioral concerns (e.g., Social Decision-Making/Problem-Solving; Good Behavior Game). In addition, the website offers an overview of specific academic interventions (e.g., Reading Recovery) and social–emotional–behavioral programs (e.g., Second Step violence prevention). The WWC reviews programs for school-based implementation and provides evidence ratings on the level of research to support practices for a variety of concerns (e.g., dropout prevention, reducing behavior problems in the elementary school classroom, improving adolescent literacy, effective literacy, and English language instruction for English learners). Thus, although an analysis of the reasons for the limited uptake of EBPs in schools suggests a need for continued focus on the development of EBPs, it also points to limited EBP dissemination and implementation as culprits in the research-to-practice gap. In this regard, an effort to increase the use of EBPs by school professionals would seem to be enhanced by increasing an understanding of which strategies have been shown to be effective as well as attention to considerations in their implementation. A key challenge for schools in facilitating optimal and effective implementation of MTSS is ensuring that school professionals have acquired knowledge and skills in EBPs.

Implementation of EBPs for Successful MTSS A critical step in helping schools and educators be successful in EBP implementation within MTSS is to foster knowledge of what strategies or approaches work to address particular academic and social behavioral problems. That is, education professionals are more prone to accept, support, and implement EBPs when they have an understanding not only of the "what" but also have skills regarding the "when and how" of prevention and intervention strategies (Forman et al. 2013). Further, the research-practice gap should lessen when school-based practitioners view EBPs as feasible and readily incorporated into what they do on a daily basis. Thus, for EBPs to move from being expected to becoming commonplace in US schools, it is essential to target school psychologists, teachers, and other school-based professionals' EBP-related knowledge, skills, and attitudes.

Several prominent researchers have documented educators' limited knowledge of EBPs for supporting students with academic and mental health issues. Stormont et al. (2011) examined teachers' knowledge of ten EBIs and resources to support children with social–emotional and behavioral difficulties. These ten programs had met criteria for empirical support (see Blueprint's for Violence Prevention; WWC), and included Positive Behavioral Interventions and Supports (PBIS), Promoting Alternative Thinking Strategies (PATHS), First Step to Success, Olweus' Bully Prevention, Positive Parenting Program (Triple P), Second Step, Good Behavior Game, Coping Power, Incredible Years, and Coping Cat. Of the ten possible evidence-based programs shown to be empirically supported, the majority of teachers in their study recognized only one EBP (i.e., PBIS). For the other nine programs, 10% or less of the teachers endorsed the programs as evidence based. Further, more

than half of the educators were uncertain whether functional assessment and intervention planning occurred at their school, and more than 75% were unclear whether any data were collected at their school on the effectiveness of school-based mental health programs. These results are similar to Stoiber and Vanderwood's (2008) study of preferred practices and reported levels of competence in urban school psychologists. School psychologists in their study reported both limited experience and low competence in practices such as conducting functional assessments and monitoring academic and behavioral interventions despite endorsing them as among the most important practices.

Evidence-Based Practices for Improving Academic and Social Behavioral Outcomes

The following sections review the current research knowledge of EBPs for implementation of MTSS to respond to students' academic and social–emotional–behavioral needs. For MTSS to be successful, students' academic and social behavior concerns should be addressed in a comprehensive and cohesive manner. Nonetheless, it is important to recognize that research-based knowledge differs depending on the instructional content and area of concern. More specifically, the empirical base regarding effective instruction and intervention in academic content domains is generally considered better developed than in social–emotional and behavioral domains. Well-regarded syntheses of research on effective literacy and mathematics instructional practices are available (see National Early Literacy Panel 2009 for a synthesis of literacy instruction; and Slavin and Lake 2008 and Slavin et al. 2009 for a synthesis of mathematics instruction). In addition, national research centers have documented EBPs that foster and support the development of reading (e.g., Center for Early Literacy Learning; National Institute for Literacy; WWC). Collectively, these evidence sources comprise a scientific foundation for schools to teach reading and mathematics effectively.

In contrast, empirical knowledge of what works to prevent challenging behavior and promote resilience is less developed, and hence, less available and applied in the schools. In particular, an understanding of how to counter student difficulties, while at the same time improve children's social competence, is needed. In a recent study, Stoiber and Gettinger (2011) demonstrated that both targets for change (that is, reducing challenging behavior *and* improving social competencies) can be viable outcomes with children at risk for developing challenging behavior, when applied using a comprehensive, systematic intervention framework. Nonetheless, the research literature indicates that different social–behavioral intervention techniques demonstrate varying levels of efficacy in promoting resilience and/or treating problematic social–emotional–behavioral patterns in children (Doll et al. 2005; Langley et al. 2010; Vaughn et al. 2009). One reason for the uneven success of social–behavioral treatments is that many of the procedures undertaken in schools have been less comprehensive, integrative, and systematic than needed. Further, there is evidence that educators and other school professionals may be reluctant to use procedures shown to be effective for addressing and improving social–emotional and behavior concerns, such as conducting functional assessments and monitoring student progress toward expected outcomes, as they lack knowledge in these procedures or may view them as complex and time-consuming (Gettinger and Stoiber 2006; Gresham et al. 2013; Stormont et al. 2011).

Recently, some applications of an integrated MTSS model have begun to emerge. For example, McIntosh and colleagues (McIntosh et al. 2006, 2010), Lane and associates (Lane et al. 2009, 2012), and Stoiber (in press) have described conceptual frameworks for the integration of both academic and behavior support within a multi-tiered system. These frameworks emphasize the importance of optimizing system-level and organizational support through a combined focus on academic and social–behavioral performance indicators. In that, an MTSS approach for both reading and behavior provides support for all students through implementation

of EBP at all tiers, there also have been preliminary efforts to examine the feasibility of integrated MTSS models. One example is the Michigan Integrated Behavior and Learning Support Initiative (MiBLSi), which is funded through the Michigan Department of Education with the goal of improving both behavior and reading skills in schools statewide (Ervin et al. 2006).

The MiBLSi initiative grew out of an understanding of the important and well-documented linkage between students' behavior and academic achievement. The use of an integrated MTSS approach allows literacy and behavioral intervention components to positively influence each other. That is, as reading improves, students are less likely to engage in disruptive behaviors. Likewise, as instructional time increases due to less time spent addressing problem behaviors, so does reading achievement. Since the initial implementation of MiBLSi in 2004, the percentage of students statewide meeting reading benchmarks has increased, on average, 5% every year, and the rate of office disciplinary referrals has decreased, on average, 10% per year (Hartsell and Hayes 2012). Moreover, participating schools have experienced, on average, a 21% reduction in special education referrals and 26% drop in identification rates, particularly between the first and second years of implementation (Michigan Department of Education 2012).

Because schools are just beginning to apply MTSS as a means to organize and deliver EBPs for students who are at risk for reading and literacy difficulties as well as those with social–emotional and behavioral concerns, much of the knowledge on EBPs is content specific. That is, for the most part, there is a knowledge base linked to EBPs for improving academic outcomes, and a separate knowledge base on EBPs for promoting social–emotional and behavioral competence. Nonetheless, there are several strategies for implementation of MTSS across domains that are considered evidence based, which are summarized in Table 1. These practices are viewed as corresponding to a comprehensive school improvement effort for improving students' academic and social–emotional performance outcomes (Lane et al. 2012; McIntosh et al. 2010).

Table 1 Implications for practice: Key characteristics of evidence-based and differentiated instruction

Explicit and/or intentional instruction occurs regularly whereby key concepts and learner expectations are taught *purposefully*
Key concepts, competencies, and learner outcomes for academic (e.g., vocabulary, listening comprehension, mathematical problem-solving) and social–behavioral (e.g., being respectful) competence development are *targeted and modeled* across all multi-tiered levels
Preventative interventions occur early and are based on relevant screening and assessment so as to maximize attempts to *close the gap* between at-risk and typically developing students
Instructional approaches at all tiers promote *active involvement* and *opportunities to respond* along with a variety of appropriate ways to be engaged and reengaged
Instruction and intervention approaches *maximize student engagement and motivation* by including clear expectations for performance balanced with flexibility and the use of choice
Keystone behaviors that promote both academic and social–behavioral success (e.g., demonstrate responsible behavior and self-regulation) are emphasized across learning environments
Instruction *progresses logically* within content domains and moves from easier concepts/skills to more challenging ones
Opportunities to practice newly learned concepts and skills are provided with varied degrees of teacher support (e.g., incorporating teacher- and peer-mediated strategies and independent practice) and different learning contexts to maximize student learning and motivation
Mastery of expected academic and social–behavioral outcomes is *monitored carefully* so that reteaching, instructional modeling, and corrective feedback occur as needed
Provision of diverse and varied *small-group instruction* wherein students are grouped based on a variety of indicators (particular skill development, need, interest)
Resources: Denton 2012; Gettinger and Stoiber 2012; Stoiber and Gettinger 2012; Stoiber in press; Vaughn and Chard 2006

Because the knowledge base on EBPs has generally been domain specific (derived through investigations focused on either the academic *or* social–emotional functioning), applications of MTSS and EBP in academic and social domains are reviewed below in separate sections. This content-specific knowledge of EBPs is viewed as foundational for helping districts and schools increase implementation of MTSS that aims to promote both academic and behavioral success among students.

Applications of MTSS and EBP in Academic Domains

Increasingly, schools are implementing tiered systems of support in an attempt to meet students' diverse literacy needs and prevent the emergence of academic difficulties (Fletcher and Vaughn 2009; Fuchs and Vaughn 2012). Although multi-leveled instruction has been promoted as EBP for all students, it has particularly been advocated for those students who struggle with reading in the primary and later elementary grades (Gersten et al. 2009). There are a variety of models associated with MTSS and EBP for literacy development, nonetheless, the common components across all applications include (a) consistent, high-quality evidence-based core instruction for all learners, (b) screening and progress-monitoring procedures to predict responsiveness to tiered instruction, and (c) more intensive interventions designed to supplement classroom instruction for students identified as being at risk based on screening indices or progress-monitoring measures (Kovelski and Black 2010; O'Connor and Freeman 2012). Typically, tiered models consist of three levels of differentiated instructional intervention (Lane et al. 2012). The tier levels are often referred to as primary or universal (tier 1), secondary or targeted (tier 2), and tertiary or intensive (tier 3).

Burns et al. (2005) synthesized the research related to multi-tiered instruction in academics, predominantly reading and literacy. These researchers found positive effects for both system-level outcomes (special education referral, grade retention, and time spent in special education) and individual student-level outcomes (achievement, growth estimates, and academic engaged time) in sites implementing tiered academic instruction. Overall, implementation of multi-tiered models increased student outcomes whether implementation was school based (mean effect size = 0.94) or researcher implemented (mean effect size = 1.14). Additional studies of multi-tiered literacy models have provided further evidence of (a) higher reading outcomes for all students over time, (b) a decrease in the number of at-risk students identified for tier 2 instruction, (c) accelerated learning (higher slope of progress) among students receiving tier 2 and tier 3 instruction, (d) a decline in the number of students in special education, and (e) a reduction in disproportionate placement of students who are male, minorities, or English language learners (ELL; Gettinger and Stoiber 2012; Torgesen 2009; VanDerHeyden et al. 2007; Vaughn et al. 2009; Wanzek and Vaughn 2011). EBPs associated with each of the tiers in a multi-tiered model are described next. To date, literacy has been the primary focus of multi-tiered delivery models. Thus, most of the knowledge of EBPs in implementing MTSS relates to the area of literacy, and is the primary area highlighted.

Universal or Tier 1 Interventions Within the first tier, all students receive instruction using a comprehensive, evidence-based core program (often aligned with state standards) provided by the general education teacher. A well-implemented and effective core curriculum program at tier 1 should help ensure that students have had adequate opportunities to learn critical content, and thus lead to fewer students requiring intervention (Vaughn et al. 2009). Teachers, nonetheless, will typically need to make adjustments at tier 1, even with an effective core curriculum. These instructional adjustments within the first tier will likely require adapting or supplementing the core curriculum to meet diverse student learner needs (Fuchs and Vaughn 2012). Examples of differentiated reading instruction at tier 1 include deciding whether a student will benefit from an additional focus on code-related (e.g.,

letter identification, letter–sound recognition) or meaning-based instruction (e.g., vocabulary, reading comprehension). Not only do teachers at tier 1 need to be able to design such instructional differentiation but they also need to have knowledge regarding instructional pedagogy such as determining when and how to alter the type and intensity of instruction and which methods should be applied to scaffold student learning (e.g., peer tutoring, peer coaching, small group instruction). To facilitate classroom teacher decision-making at the first tier, the use of a variety of screening, progress monitoring, and assessment indices is suggested (VanDerHeyden et al. 2007). Example assessment approaches include informal inventories of letter–sound knowledge or sight words, oral reading fluency indices, curriculum-based measures of vocabulary and reading, and indicators of reading comprehension (Denton 2012; Gettinger and Stoiber 2012).

The intent of tier 1 in reading is to deliver high-quality instruction that has been shown to promote key literacy outcomes. Effective tier 1 instruction is well organized and incorporates planned lessons that target key literacy outcomes including phonemic awareness, phonics, word recognition, fluency, vocabulary, and comprehension. There is a well-established evidence base documenting improved literacy outcomes when teachers implement validated practices that focus on these targeted reading skills within tier 1 (Fuchs and Vaughn 2012; Foorman 2003; Justice 2006; Torgesen 2009). At the early grade levels, an emphasis on vocabulary should include development of background knowledge in a variety of teaching contexts, automatic recognition of high-frequency irregular words, and ample opportunities for students to learn through such methods as repeated reading (Denton 2012; Gersten et al. 2009). Although less is known about effective tier 1 instruction when serving non-native English speakers, a similar focus on key components (e.g., explicit instruction in phonemic awareness, oral reading fluency, vocabulary development, etc.) is supported for ELLs in tier 1 (Vanderwood and Nam 2008). In addition, ELLs benefit from instruction focused on their specific needs in oral language development, such as extended opportunities to learn and practice vocabulary, and to use newly learned words in listening and speaking as well as in reading and writing (Crosson and Lesaux 2010). The focus on oral language for ELLs is further supported by Crosson and Lesaux's finding that the relationship between reading fluency and comprehension in native English readers appears to be moderated by ELLs' oral language development.

High-quality tier 1 instruction should lead to fewer students needing additional support and, in theory, enables 75–80 % of students to achieve expected literacy benchmarks. Thus, even with effective and differentiated tier 1 instruction, as high as 20–25 % of students will fail to develop proficiency in reading skills (Fuchs and Vaughn 2012). For some students, tier 1 instruction moves at too rapid a pace, provides insufficient practice or opportunities to respond, or does not focus on skills with sufficient intensity or duration (Stanovich and Stanovich 2003; Fuchs and Vaughn 2012). When tier 1 instruction is not adequate, students are provided more explicit and intentional instruction within higher tiers. Prior to moving students into higher-tiered interventions, however, it is important to determine whether the tier 1 instruction was sufficient. An examination of the adequacy of tier 1 should especially occur when schools or districts witness more students than the expected 20 or 25 % as failing to meet established performance benchmarks. To begin to examine whether tier 1 is sufficient in promoting expected student outcomes, educators can explore key questions that underlie the basis of MTSS. Table 2 presents ten orienting questions to facilitate such an analysis of the foundational characteristics of MTSS, and, more specifically, the quality of instruction occurring at tier 1.

The second and third instructional tiers involve evidence-based programs and practices designed to reinforce and supplement the core reading program. Within an MTSS approach, students whose benchmark screening data indicate some, but not high, risk for reading failure receive tier 2 instruction; students who are at high risk and/or not responsive to tier 2 strategies receive tier 3 instruction. Tier 2 involves instructional programs aimed at a level of skill development fur-

ther along a continuum of skill acquisition than what is targeted by tier 3 instruction, which typically targets more basic or foundational skills. In practice, tier 2 instruction begins as soon as possible after students have been identified as falling below grade-level expectations (assuming that tier 1 was deemed sufficient) and is usually implemented between 6 and 10 weeks.

Targeted or Tier 2 Interventions Instructional interventions provided at the higher tiers should not replace the core curricula, but rather aim to enhance and supplement students' learning. Meta-analytic and descriptive research reviews provide strong evidence for the effectiveness of supplemental, tier 2 instruction (Elbaum et al. 2000; Gersten et al. 2009). Tier 2 interventions may be delivered following a standard protocol for instructional interventions that permit increased practice opportunities for skill development (e.g., reading, mathematics). In the area of literacy and mathematics, researchers have established support for a number of key supplemental strategies for preschool through secondary students, including more targeted instruction with explicit modeling and teaching, greater attention to daily review activities, increased teaching for generalization and guided instruction, and multiple opportunities for practice including independent practice (Denton 2012; Fuchs and Vaughn 2012; Jones et al. 2012). Thus, in addition to covering content yoked to the core curriculum, tier 2 instruction should incorporate more exposure, more time, and more opportunities to learn. The practice of "supplementing more, more, and still more" should be apparent at tier 2.

Based on evidence presented by WWC (http://www.whatworks.ed.gov) and Gersten et al. (2009), to be effective, tier 2 reading instruction should target literacy skills for which students require additional support, occur three to five times weekly (20–40 min each session), and incorporate frequent opportunities to practice skills with teacher feedback. Several researchers have evaluated the benefits of tier 2 instruction when provided very early in the primary grades (e.g., kindergarten) versus later (winter of first grade). Example tier 2 strategies in the early grades include using repeated readings and a focus on phonemic awareness. There is some evidence that kinder-

Table 2 Ten orienting questions for examining foundational characteristics of RTI

1. Is there an effective core curriculum matched to state/district/school/center-based learner goals and expectations?
2. Is there a coordinated and aligned system of effective positive behavior support that includes social competence support/instruction and prevention and intervention strategies?
3. Are there well-articulated and meaningful goals, objectives, and/or benchmarks representing academic and social–behavioral domains and are they being used to structure instruction?
4. Is there a brief, repeatable, formative assessment of progress toward benchmarks or important learner goals that is sensitive to intervention?
5. Is there a flexible delivery of instruction that provides sufficient opportunities for practice and learning in a variety of instructional contexts (e.g., whole group instruction, small-group instruction, peer-assisted learning, independent practice)?
6. Do teaching staff use differentiated instructional strategies, including small-group instruction and repeated practice opportunities which provide effective intervention to students at risk to prevent more severe difficulties?
7. Are there decision rules or procedures for staff to mobilize intensive prevention resources very early, before serious learning difficulty and/or social–behavioral problem behavior occur?
8. Is there a school-wide collaborative process to coordinate resources within the school/district/community context to accomplish tiered prevention and intervention efforts?
9. Have teaching staff received training and practice, and do they use a broad range of "evidence-based" prevention strategies, teaching strategies, and alternative response strategies to foster positive learning and behavior in all children and to address their diverse needs?
10. Is there a mechanism or structure for the provision of consultation and/or coaching to ensure that instruction/intervention at all levels is high quality, delivered with fidelity, and evaluated to be consistent with evidence- and/or empirically validated processes and programs?

RTI response to intervention

garten may be a critical "window of opportunity" in the prevention of reading difficulties. That is, the provision of tier 2 instruction in kindergarten may be particularly potent in preventing the need for more intense intervention at a later time (Denton 2012). Other researchers, however, have noted that kindergartners who had tier 2 benefited from continued monitoring of skills during the primary grades, and some students required subsequent intervention (Kamps et al. 2008). More research is needed to determine optimal timing of tier 2 for maximizing students' reading success, especially within the primary grades.

At the secondary level, the focus of tier 2 instruction shifts to remediation and content-specific recovery. In addition to the short-term outcome of helping students pass core courses/exams, it has the long-term goal of promoting their graduation (Pyle and Vaughn 2012). Several studies have suggested that intervention emphasizing comprehension (Graves et al. 2011) and vocabulary instruction yields stronger effects for struggling students at the secondary level compared to their elementary-level counterparts (Coyne et al. 2010). Coyne et al. have documented that effective vocabulary learning for at-risk adolescents incorporates motivational strategies coupled with more complex word study (e.g., multisyllabic, vocabulary words linked to subject content). Their supplemental tier 2 vocabulary intervention targeted key vocabulary words through the provision of multiple opportunities for practice and immediate feedback.

There also is support for a multicomponent reading intervention that targets several skill areas (e.g., phonics, vocabulary, oral fluency, reading comprehension) as potentially beneficial with upper-elementary-, middle-school-, and high-school-aged students who struggle in reading (Canter et al. 2008; Graves et al. 2011). Graves et al. designed a tier 2 intervention for sixth-grade students, which consisted of a multiple evidence-based programs to target several key skills, word analysis, fluency building, comprehension, and vocabulary. That is, the tier 2 intervention consisted of different reading programs to address word analysis (i.e., Corrective Reading, REWARDS), fluency (i.e., Read Naturally) and vocabulary and comprehension (i.e., Daybook for Critical Reading and Writing). They found that intensive tier 2 instruction was beneficial for improving middle school students' oral reading fluency and reading comprehension, but no significant effects occurred for vocabulary or on a maze syntactic sentence completion measure. The results of studies such as those by Graves et al. point to the need for more attention to designing and refining targeted interventions for older struggling students. Though the knowledge base on tier 2 interventions with ELLs is somewhat limited, support exists for continued explicit focus on their oral language skills at the secondary level, including vocabulary development and providing extended opportunities for practicing learned words in communicating and in listening activities (Denton 2012; Graves et al. 2011; Vaughn et al. 2011).

Intensive or Tier 3 Interventions At the end of the designated intervention period, students may discontinue tier 2, receive another round of tier 2 instruction, or move to more intensive instruction in tier 3 (Fuchs and Vaughn 2012). The third tier consists of instruction that is customized for students who continue to struggle despite having received evidence-based universal and supplemental reading instruction (approximately 5% of students). Research has documented several effective interventions for students with severe reading difficulties that inform tier 3 reading instruction (Burns et al. 2008; Fletcher and Vaughn 2009; Kamps et al. 2008). Typically, intensive tier 3 interventions are differentiated from lower tiers by several distinguishing characteristics. These characteristics include requiring more time and resources, being implemented by an interventionist rather than the classroom teacher, and conducting progress monitoring more frequently to facilitate improved responding and instruction appropriately matched to the student's skills.

At the secondary level, there also exist some specific EBPs in MTSS. For example, these students need strategy instruction to decode and break multisyllabic words into word parts and explicit instruction in reading comprehension skill.

Due to the more extensive length of time during which students have experienced achievement gaps, secondary level students may require multiple years of intensive intervention and remediation to reach expected levels (Pyle and Vaughn 2012). Thus, the parameters used to determine the duration and level of intensity of tiered interventions will likely need to be fundamentally different for students at more advanced grade levels.

Applications of MTSS and EBP in Social–Emotional and Behavioral Domains

Similar to developments in reading and literacy, there has been increased attention to the use of scientifically based behavioral interventions and multiple levels of support to prevent the development of problem behaviors and address the needs of students with behavior challenges. Multi-tiered models for the development of social–emotional and behavioral competence incorporate a continuum of behavior support comprising intervention levels designed to prevent, respond to, and/or reduce challenging behaviors (Iovannone et al. 2009; Stewart et al. 2007). Consistent with MTSS in reading and other academic areas, this continuum is typically conceptualized as a three-tiered approach, with the intensity of intervention matched to student needs. Because a key component of social–behavioral MTSS applications is to foster positive student outcomes, it naturally shifts the blame from child-centered to ecological-focused factors (Gresham et al. 2013; Stoiber and Gettinger 2011). The majority of research-based MTSS applications for behavioral concerns are conceptualized and implemented within a Positive Behavior Support (PBS) or School-Wide Positive Behavior Support (SWPBS) framework (Horner et al. 2010).

Similar to evaluations of MTSS applications for literacy, studies of SWPBS tend to focus on the effectiveness of interventions within separate intervention tiers. In general, there is empirical evidence that when interventions within each tier (especially tier 1) are implemented with fidelity, there are improved social–behavioral as well as academic outcomes. Multiple studies have demonstrated the positive impact of SWPBS on reducing suspensions and office discipline referrals (ODRs), promoting school safety, increasing prosocial behavior while decreasing problem behavior, and enhancing student achievement outcomes (Bradshaw et al. 2008, 2010; Horner et al. 2009; Lassen et al. 2006).

Horner et al. (2010) conducted a review of 46 studies published since 2000 and concluded that SWPBS has sufficient evidence to warrant large-scale implementation. In their review of SWPBS research, Horner et al. applied a set of well-established criteria for determining whether a practice is evidence based (e.g., procedures are defined with operational precision, research employs valid and reliable measurement). Two studies, in particular, met all criteria including the use of a randomized control research design. The first of these studies randomly assigned 21 elementary schools to implement SWPBS and 16 schools to a control group. Data were collected over a 5-year period in all schools and revealed a reduction in student suspensions, fewer ODRs, and improved academic achievement for SWPBS schools (Bradshaw et al. 2010). In the second study, researchers used a randomized, wait-list controlled trial to assess the effect of SWPBS on student outcomes in elementary schools in Hawaii and Illinois (Horner et al. 2009). The use of SWPBS was related to improvements in the perceived safety of the school setting, low ODRs, and a significant increase in the proportion of third graders meeting or exceeding state reading assessment standards. Substantial evidence validates the use of PBIS/SWPBS as an effective MTSS approach to prevent challenging behaviors, to close the gap between identification and intervention, and promote success for all learners (Chitiyo et al. 2012; Horner et al. 2010; Lassen et al. 2006; Sailor et al. 2009). There is less agreement, however, regarding how often and which specific strategies/approaches used in tier 2 or 3 differ from those in tier 1 for behavioral (compared to academic) applications of multi-tiered approaches (Hammond et al. 2013; Lindstrom 2013). Thus, strategies or approaches presented below under tier 1 may be used with a

more intensive and customized manner at upper tiers. Similarly, strategies and programs described in tier 2 may be used in tier 3 and vice versa. Specific decisions regarding the amount and type of intervention used will depend on the presenting concern or possible diagnostic category being served (e.g., autism, attention deficit hyperactivity disorder; ADHD; see Hammond et al. 2013; Lindstrom 2013) and on how a state, district, and/or school have conceptualized multitiered services.

Universal or Tier 1 Interventions Within the MTSS framework, EBIs are organized into a tiered continuum that, first, provides all students with a positive classroom environment and appropriate behavior support (tier 1), and then sequences an array of interventions of increasing intensity to accommodate students whose behaviors are not responsive to tier 1 support (Sailor et al. 2009). Although there is flexibility within the MTSS framework for customizing PBS for individual schools and districts, certain practices are standard across all school-based applications. Specifically, in the first intervention tier, a small number (three to five) of positively stated, operationalized behavioral expectations (e.g., be respectful, be safe, be responsible) are taught to all students using explicit and systematic instructional procedures. It is recommended that each school-wide expectation is posted throughout the school, including classrooms and common areas (e.g., corridors, lunch room, gym). In addition, students receive frequent recognition and positive consequences for meeting expectations, and a continuum of logical consequences for clearly defined unacceptable behavior is explained and administered. For SWPBS to be effective, it requires buy-in from 80% of school staff for a 2-year period (Horner and Sugai 2009). Classroom teachers should create a positive classroom environment and be able to employ a range of consequences or intervention strategies for addressing problem behavior and deliver them consistently.

Recent indicators suggest that many children come to school with limited social–emotional competencies and would benefit from a caring, encouraging environment aimed at enhancing their motivation and sense of belonging (Peterson et al. 2013). As the focus of MTSS is on positive support, a social–emotional learning (SEL) approach is well aligned with the preventative intent of the foundational tier. The SEL approach stems from a "strengths-based" approach to student behavior with an emphasis on ecological perspectives in favor of targeting child-focused deficit factors is inherent in the SEL philosophy. The primary aims of SEL are to achieve five interrelated positive social competencies in students, self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Collaborative for Academic, Social, and Emotional Learning, CASEL; 2005). The application of SEL concepts to the school context should lead to students being better adjusted and able to focus on their academic skills, which, in turn, should lead to a reduction in social–emotional distress and conduct problems along with improved test performance and grades.

Typically, SEL school-based programs involve the delivery of classroom curricula that incorporate two key sets of educational strategies. The first strategic component includes instructional features whereby SEL skills "may be taught, modeled, practiced, and applied to diverse situations so that students use them as part of their daily repertoire of behaviors" (Durlak et al. 2011, p. 406). Delivery of this SEL program component should be conducted in a developmentally and culturally appropriate manner that fosters health-promoting outcomes and good citizenship. The SEL curricula may also aim to deter specific types of problems, such as bullying, violence, aggression, substance use, and dropping out of school. The second characteristic of SEL approaches is that they promote students' sense of school safety and connection through the provision of responsive teaching and classroom management along with community-building activities across the school environment. Several evidence-based SEL programs are available for use either as a foundational curriculum or to supplement classroom programing with suggested applications at the school-wide level (see for example, selected programs listed on www.

casel.org or the www.ctclearinghouse.com—PATHS; Second Step; Strong Kids/Strong Start/Strong Teens; Social Decision-Making/Problem-Solving Program).

For SEL programs to be effective, it is recommended that they incorporate four essential features represented in the acronym SAFE: (a) follow a *sequenced,* step-by-step approach, (b) incorporate *active* and interactive training, (c) are *focused* on specific goals with sufficient time to address them, and (d) use *explicit* teaching strategies that clarify and support learning expectations (Bond and Hauf 2004; Durlak et al. 2011). A meta-analysis of school-based universal programs was conducted by Durlak et al. to examine the effects on students' development of social competencies and related expected outcomes (i.e., enhanced social–emotional skills, positive attitudes, and positive social behaviors; reduced conduct problems and emotional distress; improved academic performance). Durlak and his associates also explored teacher effectiveness in administering SEL programs and whether multi- or single- (classroom only) component programs were more effective. In addition, they hypothesized that program outcomes would be moderated by use of the four recommended practices (i.e., sequenced, active, focused, and explicit) and by reported program implementation problems.

The meta-analysis by Durlak et al. (2011) was based on 213 studies. More than half of reviewed investigations (56%) were conducted at the elementary school level, and 47% employed a randomized design. The majority of SEL programs were classroom based and taught by teachers (53%); most occurred within urban school contexts (47%); and a minority (26%) were multicomponent programs. Meta-analysis results supported SEL programs as producing positive effects on student social–emotional competencies as well as on their attitudes toward self, others, and school. The SEL programs also were found to enhance students' behavioral adjustment (i.e., increased prosocial behavior and decreased conduct and internalizing problems).

One of the most important indications stemming from the meta-analysis is that the SEL programming led to improved academic performance, with their results showing that systematic social–emotional curricula boosted student achievement, on average, by 11 percentile points. Another noteworthy finding of Durlak et al. (2011) was that classroom teachers and other school personnel were effective in implementing SEL programs, suggesting that preventative tier 1 programs can be conducted without outside personnel. Further, SEL programs were successfully implemented across educational levels (elementary, middle, high school) and community settings (urban, suburban, rural), though they are studied less frequently in high school and rural settings. Finally, as predicted, the SAFE practices and implementation problems had an impact on student outcomes, pointing to the positive value of well-designed and well-executed programs. Interestingly, the meta-analysis did not demonstrate that multicomponent approaches such as those incorporating parent or school-wide program features produced additional benefits. This finding may be due to a restricted sample as few SEL programs added coordinated school-wide and parent components to the classroom-based programming. Thus, more research examining whether, which, and how additional components might enhance core SEL programing is needed. In addition to manualized SEL interventions, other classroom-level interventions have been shown to effectively promote cooperation and are suggested for use at tier 1. Two examples are the strategic programs, the Good Behavior Game and Red Light/Green Light, which aim to decrease classroom rule violations, while simultaneously creating a positive learning environment (Stoiber 2004).

Intervention strategies that focus more generally on promoting student engagement through environmental support and effective classroom management strategies have been shown to facilitate a positive classroom environment. Ysseldyke and Christenson (2002) identified several key conditions to support learning, such as instructional match, relevant practice, adaptive instruction, and informed feedback, that should be in place at tier 1 to assure high-quality instruction. It is recommended that specific quality

indicators are examined by school administrators' routinely conducting a "walk through" of tier 1 practices. Regardless of whether a school adopts a structured set of guidelines or a manualized SEL program, systematic and responsive teaching of appropriate behavior to all students should be apparent at the universal or primary instructional level.

Targeted or Tier 2 Interventions Tier 2 strategies are provided for students who require more structured behavioral interventions, more frequent and contingent behavior feedback, and/or more active supervision and monitoring by adults. At tier 2, social–behavioral programs typically direct greater attention on teaching schoolwide behavioral expectations to at-risk students in small groups. Teachers continue to focus on problem prevention through the provision of frequent recognition and positive consequences to students for meeting expectations. Students in tier 2 also receive systematic teaching of social–emotional skills by building in ample opportunities for them to practice competencies such as engaging peers appropriately, taking turns when talking, giving compliments, or using strategies such as "stop and think" to resist impulsive reactions or criticism. Several researchers (Gettinger and Stoiber 2006; Lane et al. 2012; Sailor et al. 2009; Stoiber and Gettinger 2011) have suggested that to determine the focus of interventions, it is useful to consider high-priority behavioral concerns and, when feasible, to integrate them within academically focused activities. These concerns are then linked to replacement behaviors or goals and subgoals that may be targeted for improvement in higher tiers, either in small groups or on an individual basis.

Several resources offering possible social competence goals to target in a tiered intervention model are available (see Durlak et al. 2011; Stoiber 2004). In designing the intervention, functional assessments can be useful for selecting appropriate social-behavior goals (Gettinger and Stoiber 2006; Gresham et al. 2013; Jones and Wickstrom 2010; Stoiber and Gettinger 2011). As school personnel choose appropriate goals, they should focus on changing behavior that students are capable of learning, keystone competencies (Gettinger and Stoiber 2006) that likely have powerful effects on adjustment, or "access" behaviors that allow entry to beneficial environments (e.g., following teacher directions, demonstrating self-control, making positive comments toward others, joining others in play or small groups). Whenever possible, simple-to-follow or uncomplicated strategies should be selected as they are more likely to result in intervention integrity and efficiency along with a greater percentage of adults scaffolding and supporting the behavior appropriately (Sanetti and Kratochwill 2009).

Several specific intervention strategies that have empirical support are suggested for use as tier 2 interventions, including modeling and guided practice strategies, coaching strategies, supportive and corrective feedback, peer-mediated strategies, and self-monitoring strategies (Greenwood et al. 2011; Stoiber 2004). When implementing these strategies, it is important that teachers/interventionists follow specific step-by-step procedures to assure they are conducted in a systematic manner. Stoiber (2004) suggests using the following steps when implementing modeling and guided practice: (a) determine what skill or competency will most benefit the student (e.g., select keystone behaviors leading to the student being accepted), (b) model the target behavior for the child several times, (c) provide opportunities for child to practice and rehearse the target behavior, (d) offer expanded experiences or situations in which the skill or competence can be applied and used successfully (e.g., small group, lunch room, playground), and (e) present specific feedback by stating or describing explicitly how and why the behavior was appropriate or inappropriate.

Peer-mediated strategies also have considerable empirical support (Greenwood et al. 2011; Latz et al. 2009; Stoiber 2004). Peer-mediated strategies incorporate the child's peers as models or "teachers" to support his/her development of social competencies. Peer-mediated approaches may be used, for example, to provide better or alternative ways for responding to aggression, resolving a conflict, or completing classwork

assignments. Types of peer-mediated strategies include peer proximity, peer prompting, peer initiation, peer–buddy interventions, and peer tutoring.

Several structured intervention programs may be especially useful for implementation of tier 2 as a method of responding to and preventing additional problem behavior, while at the same time, teaching expected and/or alternative response behavior. One program described by Crone et al. (2010) is check in/check out (CICO). To implement it, schools provide a CICO mentor with whom selected students meet at the beginning of the day to review their behavioral expectations, identify solutions to respond to any potential barriers to appropriate behavior, practice the behavior, and review their goal for obtaining daily points. Throughout the day, the student receives feedback using a daily progress report, which is reviewed by the adult mentor at the end of the day. Upon reaching the established number of daily goal-linked points, the student may be awarded a "prize" or reward. Several researchers have documented that CICO effectively reduces problem behavior across elementary and secondary students and is endorsed by school personnel as an acceptable intervention (Todd et al. 2008). The daily progress report also may be used to communicate the students' progress toward goals with families. Caution should be exercised when incorporating this home component, however, because it may be misused by a parent and result in the child being punished. Moreover, the CICO approach should not only focus on reducing problem behaviors but also on facilitating students' development of appropriate social competencies by including goals for positive behavior to monitor on the daily progress report. In this regard, CICO can be better aligned with the intent of MTSS in helping students develop social competencies such as self-control and positive classroom behaviors which are associated with improved academic success (Durlak et al. 2011; Stoiber 2004).

Another program that might be implemented as a tier 2 intervention is *Check & Connect,* which is designed to deter drop out in at-risk elementary, middle, and high school students. Similar to CICO, a mentor meets with students who are identified as benefiting from additional support to stay in school. At daily meetings with the student, the mentor discusses the importance of staying in school and monitors the student's grades, tardiness, absenteeism, and discipline infractions. Other supports may also be provided, if needed, including a behavior plan, academic tutoring, parent counseling or consultations, and social skill groups. Researchers who designed the *Check and Connect* program have conducted several studies indicating it effectively reduces problem behaviors in students with emotional and behavioral concerns at both the elementary and secondary level (Lehr et al. 2004; Sinclair et al. 2005). An additional manualized social skills program designed to provide targeted support for students who do not respond favorably to universal class-wide programs is the *Intervention Guide of the Social Skills Improvement System* (SSIS; Gresham and Elliott 2008). The intervention guide provides instruction for teaching 20 keystone social skills within a small-group structure (1 h/week), with each skill following a modeling and guided feedback format (i.e., tell, show, do, practice, progress monitor, generalize). There also are a number of cognitive-behavioral intervention programs that may include components such as goal setting, interactive role plays or activities, behavioral contracting, and corrective feedback (e.g., Steps to Respect; Resolving Conflict Creatively Program; see http://www.whatworks.ed.gov)). For students who experience internalizing issues or school refusal behavior, programs that focus on depression or anxiety may be applied. Specifically, Stark and Kendall's (1996) *Taking Action* is designed to treat students with depression and Kendall and Hedke's (2006) *Coping Cat* is for treating anxiety.

Intensive or Tier 3 Interventions Tier 3 interventions are implemented with students who require behavior support that is highly specialized, intensive, and individualized. Within the third tier, interventions focus on teaching functionally equivalent, replacement or alternative response behaviors; placing problem behaviors on extinction; strengthening the contingencies

between behavior and positive consequences; and, if necessary, applying negative consequences to eliminate severely disruptive and potentially harmful challenging behaviors (Gresham et al. 2013; Sugai and Horner 2009). Tier 3 may be delivered one on one or in small groups to the approximately 1–5% of students who do not respond sufficiently to approaches in the first two tiers. Tier 3 interventions are more strategic and focused and often of considerably longer duration than the 6–20 weeks of supplemental approaches that occur within tier 2. At tier 3, functional assessment of variables that influence student behavior is highly recommended for use in determining individualized and customized interventions (Gresham et al. 2013; Iovannone et al. 2009; McIntosh et al. 2008). Functional assessment approaches, which include examining ecological and environmental influences on the student, should not be reserved only for use at the highest tier, in that they should help facilitate a better understanding of the reasons associated with behavioral concerns at lower tiers as well. As the steps for conducting a functional assessment are available in the literature, they will not be described here in detail (see McIntosh et al. 2008; Stoiber and Gettinger 2011). It is important to note, however, that considerable evidence supports the use of functional assessment in planning a customized intervention for students who demonstrate significant social behavioral difficulties; in particular, when data are collected to define the concern and to determine the hypothesized function or intent of the inappropriate behavior (Jones and Wickstrom 2010; Gettinger and Stoiber 2006; McIntosh et al. 2008; Stoiber and Gettinger 2011). Also, information collected in the functional assessment should be drawn upon to determine appropriate goals or replacement behaviors, design the intervention, and monitor whether the intervention produced improved outcomes.

It is likely that due to the severity of the challenging behavior demonstrated in students requiring higher-tiered interventions, they will require a multicomponent support plan aimed at targeting several variables (McIntosh et al. 2009). Several researchers report the advantage of well-designed interventions matched to the hypothesized function that include clearly specified preventative, teaching, and altered response or reinforcement strategies (Iovannone et al. 2009; Stoiber and Gettinger 2011). A substantial body of research has documented the effectiveness of multiple-component, prevent–teach–respond/reinforce (PTR) interventions stemming from functional assessments that focus on improving target skills in small-group or individualized approaches (Gettinger and Stoiber 2006; Iovannone et al. 2009; Stoiber and Gettinger 2011). That is, multiple components should be included in the behavior intervention plan to address the multiple reasons linked to the behavior concern. For example, a student who exhibits severe bullying behavior will likely need a continuum of prevention and intervention strategies to teach the student how to resist engaging in verbal and physical confrontation. Relying on one or two of the interventions described in the tier 1 and 2 sections above will likely not suffice. Rather, the student may require explicit teacher-directed instruction in conflict resolution and negotiation strategies along with a mentor-facilitated behavior monitoring and behavioral contract/reward program. An important goal is to help the student develop skills in areas such as appropriate communication, self-monitoring of aggressive indicators, and de-escalation and to maintain a safe learning environment. Indeed, the adults involved in implementing tier 3 interventions also may benefit from explicit training in appropriate communication, mediation, assertiveness, and de-escalation strategies to use with the target student. Further, there are several available resources on EBI strategies and methods for selecting them that school personnel may find useful (See http://www.promisingpractices.net; Greenwood et al. 2011; Stoiber 2004; Stoiber and DeSmet 2010; Vannest et al. 2008).

Despite the level of empirical support for using functional assessments in conjunction with intervention planning and monitoring, there exists a solid body of literature indicating that educational professionals do not routinely have knowledge, skill, or experience in collecting function-based data to guide the development

of positive support plans (Gresham et al. 2013; Iovannone et al. 2009). In addition, key aspects of functional assessments are not typically being implemented in schools, including collecting and using data to define the key concern, determine the function, specify a replacement or alternative response behavior, or monitor how the intervention is working (Watson et al. 2011). Thus, even when procedures such as functional assessment are implemented, many school professionals fail to consider the resulting function-based assessment data in determining replacement behaviors, developing hypotheses for the misbehavior, and designing a function-linked intervention (Gresham et al. 2013). Further, teachers are frequently not involved in the functional assessment despite often having access to essential knowledge necessary for conducting it accurately (Iovannone et al. 2009; Scott et al. 2008). Given many educators' limited role and experience with functional assessment procedures, it may not be surprising that Stormont et al. (2011) found 57% of teachers were not sure whether functional behavioral assessments and intervention planning were provided at their school. Together, these indications suggest that functional assessment practices should receive greater attention in conjunction with MTSS.

Students with severe emotional and behavioral difficulties often require wraparound services, which include community-supported interventions by social services (e.g., child welfare) and mental health providers (Merrell and Gueldner 2010; Novins et al. 2013). For example, there exists considerable evidence for implementation of multisystemic therapy (MST) with violent and/or chronic juvenile defenders, especially when MST incorporates contingency management and intervention fidelity monitoring (Holth et al. 2011). There also is evidence that youth with ADHD symptoms benefit from psychopharmaceutical interventions, in particular, when used in conjunction with behavioral strategies (Novins et al. 2013). Other research-validated multicomponent approaches, primarily supported by single-subject studies, are often used as supplemental tier 2 or intensive tier 3 interventions (Scott et al. 2008). The collection of progress-monitoring data for determining whether and how the intervention is working should occur more frequently at tier 3, and may be necessary daily to monitor severe problem behaviors. These data should be reviewed regularly so that indicated adjustments to the intervention occur early.

Questions Regarding EBPs to Address Concerns Within MTSS

MTSS has significant flexibility that allows programs and schools to define the nature of tiered instruction along several instructional dimensions. Although this inherent flexibility promotes adoption of MTSS approaches by schools and districts, it also poses a significant challenge to evaluating MTSS applications in a controlled and systematic manner. First, educators and schools face considerable issues regarding best and/or empirically supported practices in MTSS. The majority of knowledge regarding implementation and effectiveness of MTSS stems from evaluations of interventions conducted by researchers, often with the research team providing assistance to schools, classrooms, and students. As a result, there exists limited information on the feasibility and cost of implementing EBP and MTSS in actual schools. For example, although data-based instructional decisions are considered essential for EBPs within an MTSS framework, little knowledge exists regarding several key applications by practitioners. For example, in terms of actual school-based implementation, it would be useful to develop an increased understanding of whether and what types of data sources and procedures are used, how decision-making practices stemming from these data are applied, and what guides differentiation and intervention practices in typical educational settings (Fuchs and Vaughn 2012). Perhaps most importantly, it is not known whether outcomes linked to EBP and MTSS practices are typically being evaluated and examined in schools.

Fuchs and Vaughn (2012) point out several unknowns and issues regarding best practices regarding student placement in tier 2 and tier 3. First, greater clarity is needed regarding the

criteria for determining when and whether students should move from secondary to more intensive tertiary intervention. Other questions raised by Fuchs and Vaughn include: (a) should students remain in tier 2 for long periods of time (several years) if they do not meet benchmarks?, (b) how many times should students who meet benchmarks in tier 2, but then fail to keep on target at tier 1 and repeatedly need to return to the second tier, be allowed to move back and forth?, (c) should students who exhibit substantial deficiencies despite effective tier 1 instruction be placed in tier 2 when there are clear indications that they require more intensive intervention immediately?, and (d) should students remain in tier 2 or tier 3 (when tier 3 is not deemed special education) for multiple years when their markedly slow progress suggests it is unlikely they will ever catch up? Perhaps an even more essential question relates to policy decisions for determining when and whether MTSS is necessary and a "best practice" for identifying students who have learning disabilities (and require intensive, long-term intervention). In addition to the limited information regarding the validity of various MTSS approaches, little is known regarding the practical feasibility of recommended practices such as treatment integrity checks and matching type and level of intervention to student needs. Current circumstances surrounding implementation of MTSS provide strong support for increased attention to the development and dissemination of EBPs within MTSS.

Collectively, research findings demonstrate that multi-tiered interventions exert a substantial advantage for low-achieving and at-risk children. There are some indications, however, that selected subsets of students, including those students with severe deficiencies such as learning disabilities, may not benefit from diagnostic intervention trials that occur through multi-tiered forms of intervention. Rather, such students may require more intensive and sustained interventions immediately to achieve better outcomes (Fuchs and Vaughn 2012). Thus, although considerable evidence supports MTSS and EBP for achieving academic and behavioral outcomes for most learners, more research is needed to determine whether and how these positive outcomes can be applied to all learners, especially those who are at risk for academic and social–behavioral difficulties.

Summary, Future Research, and Needed Practice Directions

Across MTSS applications for literacy, behavior, or an integrated academic and behavior focus, EBPs are an integral aspect of creating a framework to promote positive outcomes on a school- or district-wide basis. In theory, when low-level problem behaviors or literacy concerns are mitigated through an evidence-based core curriculum, additional time and resources are created so educators can focus resources on more pervasive issues (Horner et al. 2010; Stewart et al. 2007). Despite the promise of MTSS for meeting the needs of all learners, questions remain regarding the quality and conclusiveness of the current evidence base.

Concerns surrounding the research support for MTSS stem from the fact that any multi-tiered system of support is actually a constellation of several EBPs implemented within separate tiers. The multiple tiers of integrated practices used to define MTSS, as well as the flexibility afforded to schools and districts in differentiating among tiers, make it difficult to evaluate MTSS in a systematic manner. On the other hand, there are indications of the importance of districts determining the best-tiered approach to use within their schools. When innovations, such as multi-tiered models, are adapted locally, there is evidence that they have a greater likelihood of being sustained (Berkel et al. 2011). Moreover, MTSS is a school-wide preventive framework, not a standard or scripted set of behavioral programs or literacy curricula. Whereas substantial research provides evidence of individual and separate components of MTSS, less is known about the effects of large-scale comprehensive applications of MTSS as an entire system (Berkel et al. 2011). Some experts worry that such a piecemeal approach is ineffective, causing them to question whether the sum of the research on individual

parts of MTSS is as great as the whole (Burns 2010). At the same time, however, controlled studies of an entire MTSS model are complicated (Sugai and Horner 2010). Studies would need to account for the effect of every separate intervention within each tier, along with other critical components such as the level of professional development or a school's approach to data analysis for decision-making. Also, to the extent that community context (urban vs. suburban vs. rural) and social–economic conditions impact education outcomes in general (Dougherty Stahl et al. 2012; Durlak and Dupre 2008), a need exists to examine MTSS in terms of these more distal ecological factors as well.

Further complicating the situation are indications suggesting schools need help to implement evidence-based programs effectively and routinely. Surveys indicate, for example, that many schools fail to use evidence-based social–behavioral prevention programs (Ringwalt et al. 2009), that teachers lack knowledge of them (Stormont et al. 2011), and/or they are often implemented with poor fidelity (Sanetti and Kratochwill 2009). Thus, the scenario of limited incorporation of EBPs in schools likely is due to a variety of reasons ranging from school personnel not being aware of effective programs/strategies to schools lacking resources to implement them correctly and to monitor their effects. Evidence that EBPs are implemented at low rates in schools is a striking contrast to nearly 95% of all schools reporting implementation of RTI at some level and 24% reporting full implementation (Spectrum K–12 2011). These contrasting data support a wide gap between RTI and EBPs, despite federal mandates and initiatives requiring the use of EBPs in conjunction with the multi-tiered RTI and PBS.

Nonetheless, as schools continue to move toward district-wide applications of MTSS, research evaluating the benefits of comprehensive MTSS models (including an assessment of outcomes for culturally and linguistically diverse learners, as well as students with disabilities) will be a critical addition to the evidence base. It also will be important to consider ways to best operationalize MTSS so as to address the learning needs of more advanced students who not only can be easily disregarded but also should be considered in a multi-tiered model (Reis et al. 2011). Schools will benefit from the support of school psychologists and other school professionals who have research-based knowledge and practical experience in both MTSS and EBPs. Such expertise, paired with concerted efforts in completing the multiple steps in the diffusion process, will be essential to moving integrated MTSS approaches forward. In doing so, particular attention should be given to the steps linked to successful dissemination of MTSS and EBP approaches, including (a) accessing knowledge about available programs and procedures, (b) selecting strategies and programs that fit best with the school and surrounding community, (c) conducting implementation integrity checks, and (d) collecting outcome evaluation data to assess progress toward desired goals (Bernhardt and Hebert 2011; Durlak and Dupree 2008; Dougherty Stahl et al. 2012; Stoiber 2011; Stoiber and DeSmet 2010). A focus on implementation steps and ongoing assessment of the implementation climate should occur across district, school, classroom, and tiered levels in a systematic and efficient manner. These efforts should facilitate proper implementation of newly adopted strategies and programs and, moreover, ensure EBPs within multi-tiered service models are maintained and sustained as beneficial for all students for the long term.

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