

Summary of Research Findings 2006-2012
National Center for Special Education Research
Institute of Education Sciences
U.S. Department of Education

The National Center for Special Education Research (NCSEER) became part of the Institute of Education Sciences with the reauthorization of the Individuals with Disabilities Education Act in 2004. NCSEER began awarding grants in 2006 and since that time funded 233 research grants, 6 Research and Development Centers, and 12 postdoctoral training grants. NCSEER's primary mission is to support research that investigates the conditions that improve developmental and education outcomes for infants, toddlers, children and youth with disabilities or who are at risk for developing disabilities. Although NCSEER has a short history relative to the time required to build a coherent scientific body of knowledge, NCSEER researchers have made important progress in understanding factors related to children's academic growth, developing measurement systems integral to documenting children's skill development and learning, and testing interventions designed to improve educational outcomes, broadly defined to include school readiness, academic achievement, and behaviors that support learning. The work of NCSEER researchers captures the developmental range of birth through adolescence in the 13 disability categories recognized in IDEA that include sensory impairments, developmental delays, speech and language impairments, intellectual disabilities, learning disabilities, and emotional disturbance. Below we describe highlights of what has been learned across the NCSEER portfolio and describe projects that reflect our current investments.

Autism: Building Comprehensive School-based Interventions to Improve Child Outcomes

NCSEER established Autism Spectrum Disorders as a separate program for research in 2007. Recently, the Centers for Disease Control and Prevention increased the estimate of the prevalence of autism to 1 in 88 children, with a higher rate for males than for females.¹ The increased prevalence corresponds with new research focused on biomedical and genetic aspects of the condition. NCSEER, however, occupies a unique role in supporting research on *school-based interventions* for students with autism. In addition, the specific research focus in this program is on *comprehensive*, school-based interventions. These interventions target multiple outcomes that are particularly problematic for children with autism that include developmental, cognitive, communicative, language, social and behavioral, academic, and/or functional skills. Further, the emphasis is on embedding interventions within natural classroom settings to promote inclusion practices and to reach a larger number of children than can be accomplished with more narrowly aimed approaches.

NCSEER's autism intervention research has led to important findings, including the results from a randomized controlled trial of *LEAP (Learning Experiences –An Alternative Program for Preschoolers and Parents)*, a comprehensive intervention for preschool children with autism that

¹ Center for Disease Control and Prevention. (2012). Prevalence of autism spectrum disorders – Autism and Development Disabilities Monitoring Network, 14 sites, United States, 2008. *Morbidity and Mortality Weekly Report*, 61 (SS-3), 1-19.

can be embedded within existing preschool curricula. In the *LEAP* intervention, typically-developing children learn to facilitate interaction with their peers with autism, preschool teachers use naturally-occurring classroom situations for incidental teaching, and parents receive skills training. Children with autism who experienced the full-scale *LEAP* intervention model, compared to children who experienced a reduced model, demonstrated more positive child outcomes in cognition and language, a reduction in symptom severity, growth in social skills, and a reduction in problem behavior.² Importantly, the investigators are currently conducting a follow-up study to examine whether these gains persist three years after the intervention ends – a notable endeavor, as maintenance of gains is not often addressed in education research.

Currently NCSER has more experimental studies underway than have been completed. The efficacy of a number of interventions is being evaluated through randomized controlled trials, including *Adaptive Responsive Teaching* (aimed at improving developmental outcomes, ameliorating symptom severity, and preempting more serious consequences for infants most at risk for autism), *Project DATA* (interventions aimed at improving cognitive functioning, language, social relatedness, and adaptive behavior for toddlers and preschoolers with autism), and *Classroom Pivotal Response Training* (naturalistic behavioral intervention, adapted for classroom use, for improving behavioral, communication, play, and social interactions in children with autism ages 3 to 10 years).

Early Identification and Intervention: Optimizing Developmental Outcomes and School Readiness

About 1.1 million children from birth to age 5 received early intervention services under IDEA, Parts B or C in 2011,³ and many more are believed to have developmental problems but are not currently receiving services.⁴ Since 2006, NCSER supported an array of research activities designed to improve the developmental and school readiness outcomes for infants, toddlers, and young children with or at risk for disabilities through the Early Intervention and Early Learning in Special Education research program. This program comprises one of NCSER's larger investments and is unique within IES in that it includes children under 3 years of age.

Projects funded by NCSER show that interventions can help children with or at risk for disabilities successfully transition to and succeed in kindergarten. Positive outcomes include improvements in social/behavioral and early literacy skills, positive impacts on parent involvement in their children's schooling, and a reduction in the number of special education services needed with a corresponding reduction in costs associated with special education. For example, preliminary results of an efficacy study of the *Kids in Transition to School (KITS)*

² Strain, P.S., & Bovey, E.H. (2011). Randomized, controlled trial of LEAP model of early intervention for young children with autism spectrum disorders. *Topics in Early Childhood Special Education*, 31(3), 133-154.

³ U.S. Department of Education, Office of Special Education Programs, Data Analysis System (DANS). (2013). Number of infants and toddlers, birth through age 2 and 3 and older, and percentage of population, receiving early intervention services under IDEA, Part C, by age and state: Fall 2011 and Number of children ages 3 through 5 served under IDEA, Part B, by disability and state: Fall 2011. Retrieved from <http://ideadata.org/populationData.asp>.

⁴ Rosenberg, S.A., Robinson, C.C., Shaw, E.F., & Ellison, M.C. (2013). Part C Early Intervention for Infants and Toddlers: Percentage eligible versus served. *Pediatrics*, 131 (1), 38-46.

program suggest that an intervention provided during the summer before kindergarten and the first 8 weeks of kindergarten improved student and parent outcomes for children who receive early intervention and have behavioral and social problems.⁵ An early literacy intervention, *Sit Together and Read*, improved early literacy skills for children with language impairments and delays, a group that is associated with significantly lower levels of kindergarten reading achievement.⁶ A third intervention, *Pre- Kindergarten Literacy*, provides whole class and small group instruction and independent activities to develop at-risk children's skills in precursor reading abilities. The participants made gains in knowledge of letter writing, letter names and sounds, and gains in receptive vocabulary that met or exceeded the national norms for all preschool children.⁷

Developing positive peer relationships in inclusive classroom settings is another important social goal for young children. Children with disabilities who fail to develop positive social relationships with peers are at elevated risk for social maladjustment and academic failure.⁸ NCSER researchers developed and compared *Special Friends*, designed to promote acceptance of children with disabilities, to *Science Start*, a control condition that is a science and literacy program. The investigators found that there may be a tendency for children's attitudes toward peers with disabilities to worsen when they are required to interact with them, yet this is significantly less likely to occur with the *Special Friends* intervention. This finding serves to remind us of potential unintended consequences of inclusive environments.⁹

In addition to focusing on interventions to improve children's social and academic outcomes, NCSER researchers are working to improve assessment tools for screening and progress monitoring. Delays in expressive communication often are not identified until preschool, in part because of the reliance on screening tools that are not sensitive to communication problems. NCSER researchers developed and validated a universal screening and progress monitoring measure, the *Early Communication Indicator (ECI)*, which can help identify communication delays *before* the start of preschool. In addition to increasing accurate and earlier identification of children with communication problems, the *ECI* is sensitive to children's growth in communication skills which helps practitioners assess intervention needs and monitor children's progress.¹⁰

⁵ Pears, K. (2012). A randomized efficacy trial of Kids in Transition School (KITS) program for children with developmental disabilities and behavioral problems (NCSER Annual Report 2012). Eugene, OR: Oregon Social Learning Center.

⁶ Justice, L., Logan, J., Kaderavek, J., & Dynia, J. (2012). *Print-focused read-alouds in early childhood special education classrooms*. Manuscript in preparation.

⁷ Gunn, B. (2011). Developing and testing an empirically-based preschool language and literacy curriculum for children at-risk for reading disabilities using a components analysis (NCSER Final Report 2011). Eugene, OR: Oregon Research Institute.

⁸ Bukowski, W.M., & Sandberg, D. (1999). Peer relationships and quality of life. *Acta Paediatrica Supplements*, 428, 108-109.

⁹ Ostroksy, M. & Favazza, P. (2012). Establishing the efficacy of the "Special Friends" project (NCSER Annual Report 2012). Champaign, IL: University of Illinois.

¹⁰ Greenwood, C.R., Walker, D., & Buzhardt, J. (2011). The infancy to preschool early literacy connection: Validation studies of Early Communication Indicator (ECI) of Growth and Development (NCSER Final Report 2011). Lawrence, KS: University of Kansas Center for Research, Inc.

There are several other lines of research underway that address some of the field's most pressing issues for young children with or at risk for disabilities. These include how to best involve parents in interventions, promising interventions for English learners, and how to train and support the variety of practitioners who teach or provide services for infants, toddlers, and young children. As these projects come to closure, NCSER will contribute important findings to the goal of improving outcomes for our youngest and most vulnerable citizens.

Closing the Achievement Gap in Reading

The gap in reading performance between students with disabilities and their nondisabled peers is wide: 64% of eighth grade students with disabilities read below the basic level compared to 20% of their peers without disabilities.¹¹ To address this gap, NCSER supports research on effective reading instruction for students with or at risk for disabilities from kindergarten through grade 12. Seminal reports, such as the National Reading Panel report, recommend that effective reading instruction incorporate five critical skills: phonemic awareness, phonics, fluency, vocabulary, and comprehension.¹² However, questions remain about how to best teach these skills to improve literacy outcomes of students with a wide range of disabilities. Through NCSER funding, scientists develop and rigorously evaluate targeted, intensive interventions to determine which are most effective for improving reading outcomes and closing the gap between students with disabilities and their peers.

Findings from the NCSER investment in reading research indicate that intensive interventions in the five critical skills mentioned above improve reading outcomes for early elementary students with or most at risk for reading disabilities compared to interventions typically provided by schools.¹³ Further, interventions that feature an interactive approach and frequent instructional adjustments may provide advantages that extend into subsequent grades.^{14 15} Intervention research on developing the critical reading skills extends to students with intellectual disabilities. Historically, students with intellectual disabilities received literacy instruction limited to isolated skills or specific sight words deemed important for daily living. With support from NCSER, scientists began developing a body of work that investigates whether students with intellectual disabilities show gains when provided comprehensive, explicit, systematic instruction that includes word-level and comprehension skills as well as sight-word instruction. Investigators

¹¹ U.S. Department of Education, Institute of Education Sciences, National Assessment of Educational Progress (NAEP) Data, 2011, Retrieved from <http://nces.ed.gov/nationsreportcard/>.

¹² National Institute of Child Health and Human Development. (2000). Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.

¹³ Simmons, D.C., Coyne, M.D., Hagan-Burke, S., Kwok, O., Johnson, C., Zuo, Y., ...Crevecoeur, Y.C. (2011). Effects of supplemental reading intervention in authentic contexts: A comparison of kindergartners' response. *Exceptional Children*, 77, 207-228.

¹⁴ Coyne, M.D., Simmons, D.C., Simmons, L.E., Hagan-Burke, S., Kwok, O., Kim, M.,...Rawlinson, D.M., (in press). Adjusting beginning reading intervention based on student performance: An experimental evaluation. *Exceptional Children*.

¹⁵ Gelzheiser, L.M., Scanlon, D., Vellutino, F., Hallgren-Flynn, L., & Schatschneider, C. (2011). Effects of the interactive strategies approach-extended: A responsive and comprehensive intervention for intermediate-grade struggling readers. *The Elementary School Journal*, 112(2), 280-306.

demonstrated that students with intellectual disabilities can acquire phonological awareness and phonics skills, strong predictors of learning to read, and that comprehensive reading instruction produces better reading outcomes compared to instruction that only includes sight words.¹⁶ These findings are consistent with knowledge on effective, scientifically-based reading instruction for typically-developing students and suggest it may be applicable for students with intellectual disabilities. However, to reach basic levels of literacy, students with intellectual disabilities may need instruction that lasts two to three years longer than that provided to typically-developing students.¹⁷

NCSER also funds reading research with other groups of students. For example, NCSER researchers are developing and evaluating the promise of a reading intervention that incorporates critical components of early reading and also addresses the challenges with memory, expressive language, and motivation often exhibited by children with Down syndrome. NCSER also supports promising approaches for teaching the critical components of reading to young students who are deaf or hard of hearing. Preliminary results suggest that children who are deaf or hard of hearing can learn sound and letter correspondence.¹⁸

Questions remain, though, regarding the most effective instructional approaches for intervening with students who continue to show little to no improvement in reading outcomes despite receiving intensive intervention. The questions are particularly pronounced for students in late elementary school through high school. Little is known about what instruction should look like for these students with respect to content, delivery mechanisms, intensity, length, and setting. With our recently completed *Accelerating the Academic Achievement of Students with Learning Disabilities Research Initiative*, we expect a network of scientists and educators to further build a science of intensive instruction for older students.

Building a Strong Foundation in Mathematics

Just as with reading, there is an astounding math achievement gap between students with disabilities and their typically-developing peers. In eighth grade, 64 percent of students with disabilities score below the basic level compared to 22 percent of students without disabilities.¹⁹ The NCSER mathematics program continues to grow but already produced important insights into the foundations of math learning. NCSER-funded researchers report that learning difficulties apparent in mathematics by the end of kindergarten robustly and reliably predict children's mathematics growth over their subsequent five years of schooling with the implication that early

¹⁶ Browder, D., Mimms, P., Spooner, F., & Ahlgrim, L. (2008). Teaching elementary students with disabilities to participate in shared stories. *Research and Practice for Persons with Severe Disabilities*, 33, 3-12.

¹⁷ Allor, J., Mathes, P., Roberts, J., Cheatham, J., & Champlin, T. (2010). Comprehensive reading instruction for students with intellectual disabilities: Findings from the first three years of a longitudinal study. *Psychology in the Schools*, 47, 445-466.

¹⁸ Bergeron, J.P., Lederberg, A.R., Easterbrooks, S.R., Miller, E.M., & Connor, C.M. (2009). Building the alphabetic principle in young children who are deaf and hard of hearing. *The Volta Review*, 109(2-3), 87-119.

¹⁹ U.S. Department of Education, Institute of Education Sciences, National Assessment of Educational Progress (NAEP) Data, 2011, Retrieved from <http://nces.ed.gov/nationsreportcard/>.

intervention is as critical for math as it is for reading.²⁰ A second study showed the unique importance of fraction knowledge in elementary school to algebra and overall math achievement in high school.²¹ While we have known for some time the importance of the link between success in algebra and future educational and career opportunities, this study increases our understanding of the kinds of skills that predict success in algebra. Related to these findings, NCSER-funded researchers tested the efficacy of an instructional intervention focused on the teaching of fractions to students with or at risk for math disabilities. Third grade students who received this intervention experienced statistically and practically significant improvement on all fractions outcomes, including standardized measures, compared to children who received typical classroom instruction.²²

Improving Outcomes for Children with Disabilities through Technology and Small Business Innovations

NCSER-funded researchers continue to make important contributions in the area of technology for students with disabilities. Researchers are developing and conducting an initial evaluation of *SMARTSign*®, an intervention to help hearing parents of deaf children learn sign language through the video delivery of signing on mobile phones.²³ Another NCSER research project is developing *iSkills*®, a video repository of life skills tutorials for students with intellectual disabilities and autism. Designed to be delivered via handheld electronic devices, *iSkills* is intended to assist with direct instruction and self-instruction across several domains including independent living, employment, leisure, community involvement, and community navigation.

Through IES's Small Business Innovation Research Program (SBIR), NCSER funded promising technology-based interventions for students with disabilities. Researchers at HandHold Adaptive are developing *iPrompts*®, a mobile application for handheld devices to assist students with autism spectrum disorders. This best-selling app on iTunes includes picture schedules, visual countdown timers, and choice prompts designed to help teachers set expectations, ease transitions between activities, increase students' attention to tasks, and develop social skills.²⁴ In another SBIR project, researchers at ThoughtCycle are developing an integrated learning and assessment gaming system, *NumberShire*®, to assess and teach whole number concepts to first grade students with or at risk for mathematics disabilities. NCSER is committed to this line of research, as the field is likely on the cusp of many more advances in technology that will improve the lives of children and youth with disabilities.

²⁰ Morgan, P.L., Farkas, G., & Wu, Q. (2009). Five-year growth trajectories of kindergarten children with learning difficulties in mathematics. *Journal of Learning Disabilities*, 42(4), 306-321.

²¹ Siegler, R.S., Duncan, G.J., Davis-Kean, P.E., Duckworth, K., Claessens, A., Engel, M.,... & Chen, M. (2012). Early predictors of high school mathematics achievement. *Psychological Science*, 23(7), 691-697.

²² Fuchs, L.S., Schumacher, R.F., Long, J., Namkung, J., Hamlett, C.L., Cirino, P.T.,... Changas, P. (in press). Improving at-risk learners' understanding of fractions. *Journal of Educational Psychology*.

²³ Weaver, K.A. & Starner, T. (2011). We need to communicate!: Helping hearing parents of deaf children learn American Sign Language. *Proceedings of the 13th International Conference on Computers and Accessibility*, 91-98.

²⁴ Zamfir, B., Tedesco, R., & Reichow, B. (2012). Handheld "app" offering visual support to students with autism spectrum disorders (ASDs). *Computers Helping People with Special Needs*, 7383, 105-112.

Understanding the Needs of Adolescents with Disabilities

The transition from high school to post-school life is difficult for any student let alone a student with a disability. Findings from the National Longitudinal Study-2 show that students with disabilities are less likely to attend postsecondary education, be employed, and live independently compared to their peers without disabilities.²⁵ There are many questions that require attention for this vulnerable group. NCSER researchers have documented important correlates of postsecondary success and are moving toward testing interventions.

NCSER-funded researchers demonstrated that there is a strong association between high school work experiences and postsecondary outcomes for students with severe disabilities.²⁶ Another factor that appears to be important to post-school outcomes is students' self-determination, which reflects the capacity to self-advocate, problem solve, and set and attain goals. NCSER researchers reported that self-determination can be increased through intervention²⁷ and that it is causally linked to other positive outcomes including school engagement and performance.²⁸

NCSER's current research investments address the efficacy of school- and community-supported transition intervention programs, peer-supported interventions for high school students with severe disabilities, and interventions designed to improve reading achievement and persistence for secondary students with severe reading difficulties. Findings from these studies will represent important steps toward the goal of improving outcomes for adolescents with disabilities.

Improving Response to Intervention Models

Response to Intervention (RTI) is an instructional system widely adopted by districts and schools. Conceptualized as a multi-tiered (often three-tiered) model, RTI includes increasingly intensive levels of research-based intervention at each tier that is informed by screening and frequent monitoring of progress. NCSER scientists are providing new knowledge on ways to address the challenges of assessment, intervention, and implementation of RTI models.

A strong assessment system represents one important aspect of an RTI model. It allows schools to screen students to identify accurately those who show signs of academic difficulty. Screening approaches often have high rates of classification errors with the costly result of misidentifying too many children for more intensive intervention. Researchers supported by NCSER have identified valid screening approaches. For example, one approach uses a two-step screening

²⁵ Newman, L., Wagner, M., Knokey, A.M., Marder, C., Nagle, K., Shaver, D.,...Schwartz, M. (2011). *The post-high school outcomes of young adults with disabilities up to 8 years after high school. A report from the National Longitudinal Transition Study-2 (NLTS2)* (NCSER 2011-3005). Retrieved from Institute of Education Sciences website: <http://ies.ed.gov/ncser/pubs/20113005/pdf/20113005.pdf>.

²⁶ Carter, E.W., Austin, D., & Trainor, A.A. (2012). Predictors of postschool employment outcomes for young adults with severe disabilities. *Journal of Disability Policy Studies*, 23(1), 50-63.

²⁷ Weymeyer, M.L., Shogren, K.A., Palmer, S.B., Williams-Diehm, K.L., Little, T.D., & Boulton, A. (2012). The impact of the self-determined learning model of instruction on student self-determination. *Exceptional Children*, 78(2), 135-153.

²⁸ Geenen, S., Powers, L.E., Powers, J., Cunningham, M., McMachon, L., Nelson, M.,...Fullerton, A. (in press). Experimental study of a self-determination intervention for youth in foster care. *Career Development and Transition for Exceptional Individuals*.

procedure that accurately classifies first grade students as at risk or not at risk for reading disabilities which reduces the amount of instructional time lost to assessment activities.²⁹

Monitoring children's responsiveness to instruction (progress monitoring) represents a second important aspect of an RTI model. Progress monitoring allows schools to determine whether instruction is successful or should be changed to better meet students' needs. NCSER-supported scientists are developing and testing progress monitoring measures for a range of ages and academic content areas. For example, a simple measure assessing students' word fluency skills is a valid method for accurately determining reading growth for first grade children.³⁰ Similar work is underway in mathematics.³¹ Other work suggests that RTI instructional levels do not have to be experienced sequentially, with students moving through each tier. It may be more appropriate for students who require the most intensive interventions to move directly to tier 3.³² Finally, NCSER is investing in a relatively novel RTI assessment technique called dynamic assessment that may ultimately shorten the assessment-intervention cycle in RTI. Dynamic assessment may have value as part of a kindergarten or first grade screening battery for identifying young students who require intensive intervention.^{33 34}

With respect to implementation, preliminary results from a NCSER-funded study indicate that, at the end of first grade, students who had access to RTI as early as kindergarten demonstrated better reading outcomes than children who began in first grade. In addition, the scientists examined the movement of these students across tiers of intervention and found that students who had access to RTI in kindergarten moved back to general education instruction (tier 1) at greater rates than those who began RTI in first grade. Finally, the subpopulation of English learners at risk for reading disabilities saw the greatest benefit from early access with statistically significant reading outcomes at the end of second grade.³⁵

NCSER is extending its investment in RTI and building a science of RTI implementation for young children (ages 3-5) through a series of studies conducted by a Research and Development Center and other research grants. Researchers are addressing questions related to effective

²⁹ Compton, D.L., Fuchs, D., Fuchs, L.S., Bouton, B., Gilbert, J.K., Barquero, L.A.,...Crouch, R.C. (2010).

Selecting at-risk readers in first grade for early intervention: Eliminating false positives and exploring the promise of a two-stage screening process. *Journal of Educational Psychology*, 102(2), 327-340.

³⁰ Zumeta, R.O., Compton, D.L., & Fuchs, L.S. (2012). Using word identification fluency to assess first-grade reading development: A comparison of two word-sampling approaches. *Exceptional Children*, 78, 201-220.

³¹ Foegen, A. & Morrison, C. (2011). Putting algebra progress monitoring into practice: Insights from the field. *Intervention in School and Clinic*, 46, 95-103.

³² Compton, D.L., Gilbert, J.K., Jenkins, J.R., Fuchs, D., Fuchs, L.S., Cho, E.,...Bouton, B. (in press). Accelerating chronically unresponsive children to tier 3 instruction: What level of data is necessary to ensure selection accuracy? *Journal of Learning Disabilities*.

³³ Bridges, M.S. & Catts, H.W. (2011). The use of a dynamic screening of phonological awareness to predict risk for reading disabilities in kindergarten children. *Journal of Learning Disabilities*, 44.

³⁴ Fuchs, D., Compton, D.L., Fuchs, L.S., Bouton, B., & Caffrey, E. (2011). The construct and predictive validity of a dynamic assessment of young children learning to read: Implications for RTI frameworks. *Journal of Learning Disabilities*, 44.

³⁵ O'Connor, R.E., Bocian, K.M., Sanchez, V., & Beach, K.D. (in press). Access to a Responsiveness to Intervention Model: Does Beginning Intervention in Kindergarten Matter? *Journal of Learning Disabilities*.

instruction across all tiers, efficient implementation and allocation of resources, valid and reliable measures for screening and monitoring progress across tiers that may improve academic outcomes and reduce special education referrals and placement.

Improving Social, Emotional, and Behavioral Skills with Targeted Interventions

Teachers recognize that if children cannot manage their behavior, they cannot learn. There is an empirical link between social, emotional, and behavioral skills and outcomes for students with or at risk for disabilities, yet attention to improving practices in schools has been limited. For example, youth with emotional and behavioral disorders (ED) are more likely than other student disability groups to experience poor educational outcomes (e.g., dropping out of school, lower rates of postsecondary education and employment), and these outcomes have persisted for decades.^{36 37} NCSEER has built on the growing interest in, and recognition of, the association between children's social-emotional functioning and academic outcomes by funding a range of research in this area.

Students who display a high degree of disruptive and aggressive behavior in elementary school are at greater risk for educational difficulties and poor post-school outcomes. NCSEER-supported research demonstrates that programs implemented in elementary school improve students' behavior in the classroom *and* improve educational performance relative to students in comparison schools. One such program, *First Step to Success*, was tested in both an efficacy and effectiveness study that included a heterogeneous group of students.^{38 39 40}

Tools For Getting Along (TFGA) curriculum for 4th and 5th grade classrooms is designed to ameliorate emotional/behavioral problems by teaching social problem solving. Students who received this intervention improved their cognitive and emotional self-regulation, increased their pro-social choices, and used a more positive approach to problem solving than their peers who did not receive *TFGA*.⁴¹ The *Class-wide Function-based Intervention Teams (CW-FIT)* intervention focuses on a different set of skills that includes appropriate behavior skills (e.g., how to appropriately gain the teacher's attention), as well as individual intervention procedures

³⁶ Wagner, M. (1995). Outcomes for youths with serious emotional disturbance in secondary school and early adulthood. *The Future of Children*, 5, 90-112.

³⁷ Bradley, R., Doolittle, J., & Bartolotta, R. (2008). Building on the data and adding to the discussion: The experiences and outcomes of students with emotional disturbance. *Journal of Behavioral Education*, 17(1), 4-23.

³⁸ Woodbridge, M.W., Sumi, W.C., Thornton, P., Javitz, H., & Wagner, M. (2009). An efficacy trial of First Step to Success (NCSEER Final Report 2009). Menlo Park, CA: SRI International.

³⁹ Walker, H.M., Seeley, J.R., Small, J., Severson, H.H., Graham, B., Feil, E.G.,...Forness, S.R. (2009). A randomized controlled trial of the First Step to Success early intervention: Demonstration of program efficacy outcomes within a diverse, urban school district. *Journal of Emotional and Behavioral Disorders*, 17, 197-212.

⁴⁰ Sumi, W.C., Woodbridge, M.W., Javitz, H.S., Thornton, P., Wagner, M., Rouspil, K.,...Severson, H.H. (2012). Assessing the effectiveness of First Steps to Success: Are short-term results the first step to long-term behavioral improvements? *Journal of Emotional and Behavioral Disorders*.

⁴¹ Daunic, A.P, Smith, S.W., Garvan, C.W., Barber, B.R., Becjker, M.K., Peters, C.D.,...Naranjo, A.H. (2012). Reducing developmental risk for emotional/behavioral problems: A randomized controlled trial examining the Tools for Getting Along curriculum. *Journal of School Psychology*, 50, 149-166.

for students who do not successfully respond to the class-wide intervention. Children in *CW-FIT* classes showed improvement in on-task behavior and decreases in the number of disruptions.⁴² Students at risk for emotional and behavioral disorders showed decreased disruptive behaviors and increased on-task behavior.

NCSER also supports research on *Positive Behavioral Interventions and Supports (PBIS)*, a school-wide model that has garnered national attention. NCSER investigators demonstrated that enhanced training, support, and on-site technical assistance to the collaborative problem-solving teams (e.g., *PBIS Student Support Teams*) at schools already implementing universal *PBIS* leads to positive student outcomes.⁴³ Positive outcomes included lower rates of teacher-reported special education services use by students, improved teacher-ratings of student achievement, and reduced student need for and receipt of classroom-based behavioral supports. Not every outcome of interest showed positive effects (e.g., achievement on state-wide assessments) but these results are encouraging and support further investments.

Attention deficit/hyperactivity disorder (ADHD) is another area where strides have been made. It is one of the most commonly diagnosed mental health disorders in school-aged children, and many students with emotional disturbance and other health impairments have co-occurring ADHD. NCSER-funded researchers are adding to our understanding of effective school-based behavioral interventions for this population of students. For example, students receiving daily report cards (i.e., parents receive daily reports of their child's behavior) significantly improved classroom behavior compared to students who did not receive the intervention.⁴⁴ Another study compared school-based behavioral treatment to treatment with medication, a controversial issue. The researchers found that beginning the school year on medication versus a standard evidence-based behavioral intervention produced differences in the need for further treatment.⁴⁵ Specifically, trying evidence-based behavioral classroom-management strategies and standardized school-home communication before beginning medication may eliminate the need for medication in a substantial number of cases. In addition, an adaptive treatment design was implemented which is rarely used in education. Thus, the investigators contributed both substantively (i.e., results of the treatment sequencing) and methodologically (i.e., use and analysis of adaptive treatment designs in educational settings).

In behavioral research, success of interventions depend in part on valid screening assessments to identify the children most in need of intervention and effective behavioral progress monitoring

⁴² Kamps, D., Wills, H., Heitzman-Powell, Jaylin, J., Szoke, C., Hobohm, T., & Culey, A. (2011). Class Wide function-related intervention teams: Effects of group contingency programs in urban classrooms. *Journal of Positive Behavioral Interventions*, 13, 154-167.

⁴³ Bradshaw, C.P., Pas, E.T., Goldweber, A., Rosenberg, M., & Leaf, P.J. (2012). Integrating School-wide Positive Behavioral Interventions and Supports with Tier 2 Coaching to Student Support Teams: The PBISplus Model. *Advances in School Mental Health Promotion*, 5(3), 177-193.

⁴⁴ Fabiano, G.A., Vujnovic, R.K., Pelham, W.E., Waschbusch, D.A., Massetti, G.M., Pariseau, M.E.,... Volker, M. (2010). Enhancing the effectiveness of special education programming for children with attention deficit hyperactivity disorder using a daily report card. *School Psychology Review*, 39(2), 219-239.

⁴⁵ Pelham, W.E., Fabiano, G.A., Waxmonsky, J.G., Greiner, A.R., Gnagy, E.M., & Murphy, S.A. *Treatment Sequencing for ADHD: An Adaptive, Multiple-Randomization Study of Medication and Behavioral Interventions*. Manuscript submitted for publication.

tools to evaluate children's response to the interventions. NCSER is advancing the field in this area through behavioral assessment grants. A short screening assessment, the *Behavioral and Emotional Screening System (BESS)* was developed for use by teachers to identify elementary and middle school children with behavioral or emotional problems that predispose them to academic failure.⁴⁶ The researchers determined that the *BESS* is an efficient and comprehensive method for early identification of students at risk of experiencing behavior problems thereby addressing a longstanding need of researchers and practitioners.

NCSER also is supporting the development of efficient and change-sensitive tools for behavior progress monitoring for practitioners. These new tools combine the strengths of systematic direct observation (repeatability, flexibility) with the efficiency of standardized behavior rating scales. For example, researchers who developed *Direct Behavior Rating* tool (*DBR*) indicate that *DBR* is efficient, repeatable, and flexible.⁴⁷ *DBRs* facilitate interventions designed to improve behavior and serve as a communication device to share information among key persons in a child's life.

Summary

Over seven years of research funding, NCSER made considerable investments to address many of the most pressing issues in special education. NCSER-funded researchers are finding ways to identify children with or at risk for disabilities at a young age so that services can be provided as early as possible, developing comprehensive interventions for the many skill areas affected in children with autism spectrum disorders, developing and testing interventions to close the achievement gaps in math and literacy for children with or at risk for disabilities, testing the efficacy of social/emotional and behavioral interventions that show promise for improving outcomes for children with ADHD or ED, and leveraging technology to instruct or provide support for those with significant impairments or who face significant challenges in daily functioning. Investments in three of our research programs - early intervention, social and behavioral outcomes, and reading - have already paid off as determined by the number of efficacious interventions and valid assessment systems developed and tested by NCSER-funded investigators. The NCSER research portfolio is growing in other areas such as mathematics, technology, autism, and adolescents with disabilities. As more of NCSER-funded work moves toward efficacy trials, we expect to learn a great deal more about methods that will improve outcomes for the 12% of the nation's children who have identified disabilities and the large number of children who are at risk for developing disabilities or who have not yet been identified.

⁴⁶ Chin, J., Dowdy, E., & Quirk, M. (2012). Universal screening in middle school: Examining the Behavioral and Emotional Screening System. *Journal of Psychoeducational Assessment*. Published online before print July 20, 2012.

⁴⁷ Chafouleas, S.M., Riley-Tillman, T.C., & Christ, T.J. (2009). Direct Behavior Rating (DBR): An emerging method for assessing social behavior within a tiered intervention system. *Assessment for Effective Intervention*, 34, 201-213.