Empirical research in the treatment of autism spectrum disorders (ASDs) has resulted in the identification of numerous evidence-based interventions (EBIs). Adolescents with an ASD are faced with unique academic challenges, complex social environments, and physiological changes. They often require interventions to aid in acclimating to their evolving social environments and physical changes. One of the many challenges for practitioners working with adolescents is turning research findings into practice. We provide a framework to build capacity within a middle or high-school setting to implement EBIs for adolescent students with an ASD. Key elements of implementing EBIs in the school setting include: developing a team of professionals dedicated to achieving a system change, a systematic plan, monitoring progress, and a plan for sustainability. Teacher training is an essential part of implementing EBIs in an educational setting. Empirical evidence suggests that teacher training consists of different strategies including in-vivo training. Accessing resources outside of the school system, such as professionals at universities and teaching hospitals, can aid in training and other aspects of implementing EBIs in the classroom.

The definition of adolescence often includes various stages of physical and emotional development and a corresponding chronological age range (e.g., American Academy of Child & Adolescent Psychiatry, 2011a). However, different sources provide different chronological age ranges (e.g., American Academy of Child & Adolescent Psychiatry, 2011b; Greydanus, 2003; World Health Organization, n.d.) According to Greydanus & Bashe, 2003, adolescence refers to individuals ranging in age from 11 to 21 years. This age range is divided into early (ages 11–13), middle (ages 14–18), and late (ages 19–21) adolescence. Adolescence is set apart from other developmental stages (e.g., early childhood and elderly) by the development of higher cognitive functioning, development of sexuality and intimate relationships, moving from educational services to vocational training, and work in the community (American Psychological Association, 2002).

Adolescents with an autism spectrum disorder (ASD) are not immune to the challenges that come with typical adolescent development. Therefore, interventions to improve the quality of life for adolescents with an ASD should incorporate developmentally appropriate goals using evidence-based interventions (EBIs). The objectives of this article include 1) identifying EBIs for adolescents with an ASD; 2) providing a framework for schools to build capacity to implement the EBIs; and 3) providing examples of capacity building for schools educating adolescents with an ASD.

In recent years, there have been a number of systematic reviews completed that identify EBIs for the treatment of individuals with an ASD (Huffman, Sutcliffe, Tanner, & Feldman, 2011; National Autism Center [NAC], 2009 Odom, Collet-Klingenberg, Rogers, & Hatton, 2010; Warren et al., 2011; Young, Corea, Kimani, & Mandell, 2010). The systematic reviews have led to the identification of a number of interventions and techniques with quality scientific evidence to support their use with individuals with an ASD, including adolescents. Although the systematic reviews noted above included a wide age range (i.e., birth through adulthood), only the National Standards Project (NSP, NAC, 2009) and Young et al. (2010) teased out interventions applicable to adolescents.
Table 1
EBIs as Identified in the NSP (NAC, 2009) and Young et al. (2010)

<table>
<thead>
<tr>
<th>Age Range</th>
<th>10-14</th>
<th>15-18</th>
<th>19-21</th>
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<tbody>
<tr>
<td>Evidence-Based Intervention</td>
<td>Antecedent Package (NSP)</td>
<td>Antecedent Package (NSP &amp; Young et al., 2010)</td>
<td>Antecedent Package (Young et al., 2010)</td>
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<tr>
<td></td>
<td>Behavioral Package (NSP)</td>
<td>Behavioral Package (NSP)</td>
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<td>Modeling (NSP)</td>
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<td>Peer Training (NSP)</td>
<td>Self-Management (NSP)</td>
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<td>Schedules (NSP)</td>
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<td>Self-Management (NSP)</td>
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<td></td>
<td>Story-Based Intervention (NSP)</td>
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</table>

with an ASD. Table 1 provides a summary of EBIs for adolescents as identified in the NSP (NAC, 2009; Young et al., 2010).

EBIs are important but only a single component of evidence-based practice. Evidence-based practice, as defined by Sackett (1996), includes implementation of interventions supported by empirical research, using professional judgment and the consideration of client values and preferences. This article will focus on a discussion of building capacity within middle and high schools to implement EBIs for adolescents. To implement evidence-based practice as defined by Sackett (1996), additional consideration should be given to train educators in the use of professional judgment and the importance of family and student values and preferences.

Educational and Behavioral Needs Unique to Adolescents

Some of the needs unique to adolescent students with an ASD include the development of a transition plan, implementation of vocational training, and education around sexuality (Koller, 2000; Roberts, 2010; Wehman, Smith, & Schall, 2009). Transition planning for adolescents with an ASD may include preparation to participate in a day-treatment program as an adult or preparation for college. Vocational training may occur in simulated work environments and/or community settings. Finally, education around issues of sexuality, health, and safety are topics that educators working with adolescents with ASD face regularly. Without an efficient, effective system in place to guide the development of individualized goals to meet the unique needs of adolescents with an ASD, educators may be left to piecemeal complex educational and behavioral protocols. However, developing a systematic plan to utilize EBIs to address educational and behavioral needs of adolescents with an ASD can result in improved outcomes for educators and students.

Supporting Capacity Building

The application of research to practice is a challenge in many professional fields, and implementation of EBIs in an educational setting is no exception (Lerman, Vorndran, Addison, & Kuhn, 2004). Professionals in schools, consulting agencies, and specialized programs require the capacity to implement EBIs. In this era of budget cuts and limited resources, the notion of capacity building to support the use of EBIs for ASDs is not often met with excitement. However, there are a number of reasons to focus on building capacity to implement these interventions for adolescents with an ASD. First, the Individuals with Disabilities in Education Improvement Act (2004) and No Child Left Behind (NCLB, 2002) require the use of interventions based on “scientifically-based research” (16) in the school setting. NCLB (2002) specifically outlines the definition of “scientifically-based...
research” as involving systematic and empirical methods, rigorous data analyses, reliable and valid methodology, use of experimental or quasi-experimental designs, ability for systematic replication, and submission to a peer-review process.

Second, adolescents with an ASD should be afforded access to EBIs. For adolescent students with an ASD to make adequate progress in educational domains, interventions targeting these domains (e.g., Schedules, Antecedent Package, and Behavioral Package) must be based on quality scientific evidence. Third, there are resources in many school districts that could be allocated in a more relatively prudent manner. That is, whenever sufficient evidence supporting treatment for a population (e.g., adolescents with ASD) is available, money should be spent on these interventions, rather than allotting funds to interventions without scientific support.

Unlike the abundance of empirical treatment literature for young children with an ASD, there is a paucity of treatment outcome studies focused on adolescents with an ASD. That is not to say that some EBIs for young children cannot be adapted to adolescents with an ASD, but there is certainly a dire need for more empirical evaluations of treatments for adolescents with an ASD (Iovannone, Dunlap, Huber, & Kincaid, 2003). For example, according to the NSP (NAC, 2009), Peer Training interventions are identified as an EBI for children aged 3 to 14 years. Does this mean that Peer Training will not be effective for adolescents 15 to 18 years of age? Probably not, but more research to support Peer Training and other EBIs for adolescents is necessary.

Finally, educators should be adequately prepared to manage the educational and behavioral needs of adolescents with an ASD. Ayres, Meyer, Erevelles, and Park-Lee (1994) surveyed teachers’ use of evidence-based practice and found that teachers self-reported difficulty with implementation, time constraints, and limited administrative support as barriers to implementing EBIs. Although extensive consideration is given to the idea of linking science with practice, it remains unclear as to how educators are to implement EBIs.

COMPONENTS OF CAPACITY BUILDING

There is a vast literature on capacity building in the medical field, nonprofit organizations, and school settings (Allsop & Stevens, 2009; Connolly & York, 2002; Hoyle, Samek, & Valois, 2008; Loureiro & Freudenberg, 2012; Wing, 2004). Essential elements of capacity building in the educational setting include consensus from all levels of administration, a dedicated team of professionals to monitor and evaluate program changes, assessment of current resources and needs, and ongoing professional development of educators (Hoyle et al., 2008; Mathur, Clark, & Schoenfeld, 2009; McLaughlin, Leone, Meisel & Henderson, 1997; Wilczynski, Russo, & Christian, 2008). Building capacity within a middle-school or high-school system requires the commitment of educators and administrators, as well as time to implement change.

Lachat (2001) provides examples of effective capacity building in high-school settings. The examples are provided as narratives after high schools completed 1 year toward building capacity for effective data-based decision making. After just 1 academic year, principals and high-school teachers could identify a number of areas in which change was evident and capacity building had a positive impact. Although the author did not focus on implementation of EBIs in the high-school setting, the process of capacity building discussed could easily include implementation of EBIs for adolescents with an ASD. Lachat (2001) provides evidence that large-scale, systematic change in a high-school setting can be successful.

IDENTIFICATION OF THE CAPACITY-BUILDING TEAM

The initial step in proceeding with systematic change to build capacity requires the development of a team to oversee the process (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). Team members should consist of principals, superintendents, educators, nursing staff, school psychologists,
allied health professionals (e.g., speech-language pathologists and occupational therapists), Board Certified Behavior Analysts, paraprofessionals, and vocational trainers. Each of these professionals is responsible in some manner for the behavioral, vocational, and educational programming for adolescent students with an ASD.

Principals and superintendents provide support to educators in many ways, including accessing resources and ensuring adherence to policies and procedures. Allied health professionals work individually or in small groups with adolescents with an ASD. Educators within special education classrooms and mainstream classrooms are ultimately responsible for the implementation of educational programs. Often, paraprofessionals have daily contact with adolescents with an ASD. Much literature exists demonstrating the importance of paraprofessional training (Hall, 2009). Although the average number of instructional paraprofessionals in a high-school setting is fewer than in an elementary-school setting (seven vs. eight, respectively), paraprofessionals in a high-school setting are more likely to be full-time employees (Hampden-Thompson, Diehl, & Kinukawa, 2007). Therefore, representation from paraprofessionals working in the middle- or high-school setting can provide valuable input to the capacity-building team.

The complexity of systems change to implement EBIs is evident even from the initial team development stage. Adoption of new strategies (e.g., Schedules, Antecedent Package strategies, or Self-Management protocols) into any system requires careful planning, a systematic approach, and documentation of progress. Systematic change to build capacity in a middle- or high-school setting will not happen overnight. Wing (2004) suggests that within nonprofit organizations, capacity-building projects can span 1 to 5 years, with an average of approximately 2 years. In terms of time span for capacity building in a middle-school or high-school setting, professionals may want to extend the timeline of full implementation of a program. Given that a majority of high-school professionals work approximately 9 months of the year, consideration for an academic calendar is necessary. Capacity-building teams may want to outline specific “short-term goals” that can be achieved during one quarter of the academic year. For instance, a short-term measurable goal for building capacity to include EBIs in a vocational training program could be meeting with vocational trainers to assess current use of EBIs.

MISSION AND ASSESSMENT

To initiate a capacity-building movement to implement EBIs for adolescents with an ASD, administrators and educators must be in agreement with the mission. The development of a mission statement can set the course for the changes required to build capacity (Venture Philanthropy Partners, 2001). The mission statement should include identification of the individuals responsible for carrying out the mission, the overarching goal(s), and the ultimate outcome as it relates to adolescents with an ASD. For example, if the capacity-building team members are interested in community-based vocational training, a mission statement might include information regarding participating community employers, employment outcomes for the students, identification of reliable resources for EBIs for adolescents, and identification of outcomes for the school vocational program.

The team should then complete an assessment of current capacity and needs (Wilczynski et al., 2008). The assessment should address several areas: 1) educators’ knowledge of EBIs for adolescents with an ASD; 2) inventory of current EBIs in practice; 3) resources needed at a classroom level (e.g., curriculum and materials); 4) resources needed at a school level (e.g., staffing and building space); and 5) consultation needs. Wilczynski (2009) published a brief assessment of educator knowledge regarding EBIs (see Appendix). This basic assessment is based on the eleven EBIs identified by the NSP (NAC, 2009). This assessment was modified with highlighted sections indicating EBIs specific to adolescents with an ASD. Use of this assessment can aid in the identification of educators who may be trained in various EBIs and areas in which educators require training.
Hendricks, Smith, & Wehman (2009) described the complexities of developing a community-based work program for adolescent students with an ASD. Conducting a job-market analysis, setting up a community-based site, and implementing and evaluating instructional strategies are just a few of the steps the authors suggest for a viable community-based work program (Hendricks et al., 2009). The EBIs identified in the NSP (NAC, 2009) can be used for acquisition of vocational skills as well as decreasing the frequency of challenging behavior in a community-based work program. For instance, Self-Management interventions were identified as an EBI for adolescents with an ASD. A vocational trainer could easily make use of an individualized Self-Management protocol to assist an adolescent with maintaining low rates of repetitive or self-stimulatory behaviors in the work setting. In terms of assessment for the development of a community-based work program, the capacity-building team would be tasked with assessing resources within the school setting as well as in the community setting. Additionally, vocational trainers participating in a community-based work program would also be required to complete the assessment regarding their knowledge of EBIs for adolescents with an ASD.

Training and Consultation

Ongoing training and coaching for educators is a critical component of developing capacity to implement EBIs in middle-school and high-school classrooms. Several studies suggest that attendance at a workshop and didactic instruction are not sufficient when trainees are expected to implement new strategies in an applied setting such as a classroom (Dixon et al., 1999; Smith, Parker, Taubman, & Lovaas, 1992). Workshops and in-service training opportunities can provide an introduction to new strategies and interventions. However, to maintain a relatively high degree of treatment fidelity, educators should have the opportunity to participate in in-vivo training and should have access to ongoing consultation (Duhon, Mesmer, Gregerson, & Witt, 2009; Fixsen, Blase, Horner, & Sugai, 2009; Gilbertson, Witt, Singletary, & VanDerHeyden, 2007). This type of training model often involves collaboration with professionals working in settings other than school districts.

The literature regarding capacity building suggests that the team employ the assistance of professionals outside the organization that is undergoing change (Fixsen et al., 2005). Often, schools collaborate with universities, hospitals, or other agencies that employ professionals with expertise who can assist in various components of building capacity (Lerman et al., 2004). For example, Hoyle et al. (2008) described the success of the Pueblo, Colorado, School District 60 in increasing capacity of schools’ ability to promote the health and well-being of students. The project included wellness programs at selected middle schools and high schools in the district. To accomplish this lofty goal, the committee overseeing the capacity-building project enrolled the expertise of local professionals outside the field of education. The benefits of consultation from professionals external to the school resulted in a strengthened health program and enhanced training opportunities for educators (Hoyle et al., 2008).

Another example comes from the literature regarding health and sexuality education. Numerous authors have noted the need for training around issues of sexuality for adolescents with an ASD (Hatten & Tector, 2010; Klet & Turan, 2012; Koller, 2000; Sullivan & Caterino, 2008). Colarossi, Betancourt, Perez, Weidi, & Morales (2013) described a capacity-building program to enhance training focused on sexuality and health. Although Colarossi et al. (2013) discussed protocols for typically developing adolescents, the model and community partnerships could be considered for adolescents with an ASD. Colarossi et al. (2013) described partnerships with agencies providing after-school education and with Planned Parenthood. When considering building capacity for an educational program focused on sexuality, the capacity-building team may want to investigate health care agencies in the community that are equipped to provide assistance or resources.
Capacity-building team members must decide the focus of training (i.e., the EBIs to train) for professionals working with adolescents with an ASD. Teams are urged to make use of the results of the NSP (NAC, 2009), as the authors have provided tables, definitions, and other resources that can be used to inform training protocols. As training proceeds, measures of competence, fidelity, and social validity should be administered to monitor progress. Competency measures provide trainers and trainees with information regarding effectiveness of training methodology and areas of strength and weakness.

Luiselli, St. Amand, MaGee, & Sperry (2007) demonstrated the use of competency-based measures following training. The authors developed measures to ensure basic levels of mastery for a group training in applied behavior analysis. Results of these measures provided trainers with guidance on which components of training require further instruction. Measures of fidelity provide evidence that interventions are implemented appropriately in an applied setting (e.g., classroom). Empirical studies suggest that the level of treatment fidelity can impact student outcomes (DiGennaro, Martens, & Kleinmann, 2007; DiGennaro, Martens, McIntyre, 2005). Although no practitioner implements a treatment or educational protocol with 100% accuracy, it is important to monitor how fidelity may affect student outcomes. Finally, measures of social validity provide the opportunity for trainees to provide feedback on the process of didactic and in-vivo training.

Working with adolescents with an ASD can bring challenges to measures of fidelity. For instance, special consideration may be needed for observing implementation fidelity in a community-based vocational program or a program focused on health and sexuality. Klett & Turan (2012) described the use of Social Stories (an identified EBI for adolescents with ASDs) to train adolescent females with an ASD to independently engage in self-care skills during menstruation. Some of the skills targeted for acquisition included changing a sanitary pad. The results suggested Social Stories were an effective component of the skill acquisition protocol. However, the authors noted limitations that included the inability to collect fidelity data due to scheduling issues, as Social Stories were used during morning and evening routines. Measures of fidelity in the home and community setting can bring unique challenges to staff members attempting to incorporate EBIs for adolescents. The capacity-building team will need to allow opportunities for problem solving (e.g., regularly scheduled meetings with educators) throughout the training and implementation of EBIs for adolescent students with ASDs.

Capacity building to incorporate EBIs for adolescents with ASDs should be individualized to meet the needs of the unique system (e.g., a high school), just as educational plans are individualized for students. There are a number of professional agencies and organizations that provide resources for professionals interested in EBIs for adolescents with an ASD (e.g., NAC, National Professional Development Center, and Association for Science in Autism Treatment). Using information from reliable resources, capacity-building teams can develop tools and technologies to document and move system change forward. Development of tools need not be a daunting task. There is empirical evidence that implementation of simple checklists, as described in Gawande (2009), can aide in accomplishing complex tasks (Albuquerque, Miller, & Roeske, 2011; Winters et al., 2009). Checklists can be used to monitor the general process of system change (e.g., identification of team members and meeting schedules) and to train educators in specific EBIs (e.g., components of training protocols for implementation of Self-Management protocols). Gawande (2009) urges professionals in any field to make use of checklists to decrease errors and monitor the progress of a variety of tasks.

**Measures of Progress**

Ultimately, it is the progress the students with an ASD make that will determine the success of a systems change in a middle-school or high-school setting. The capacity-building team will be tasked with identification of specific student outcomes that indicate progress, such as the amount
of time an adolescent student with an ASD is able to attend to didactic instruction in a mainstream classroom, the ability to work independently in the community, the reduction in aggressive behavior demonstrated by some students, or the ability to participate in small-group activities, as opposed to one-to-one staffing. The goals should be well defined, behaviorally oriented, and measurable. Further, it is important to collect baseline data on these goals prior to implementing the systems change. Collection of baseline data will allow the team to evaluate student progress prior to and following implementation of the new EBI protocol.

Once all practitioners (e.g., educators, para-professionals, and allied health professionals) are trained in implementing the EBI protocols, sustainability becomes crucial. The team must ensure that effective training and practices are maintained over time. This is achieved with periodic monitoring of the system through meetings, treatment fidelity checks, and continued professional development. The capacity-building team should meet on a monthly or quarterly basis to engage in problem solving, review data (e.g., student progress), and consider training opportunities. Problem solving may be necessary when the team is faced with situations such as staff turnover or an adolescent student in crisis. The treatment literature for adolescents with an ASD is active and must be monitored. As EBIs for adolescents with an ASD evolve and become increasingly sophisticated, staff training in new strategies will be required. Periodic measures of treatment fidelity provide assurance that educators have not “drifted” in the prescribed implementation of EBIs.

In summary, capacity building to implement EBIs in a middle-school or high-school setting is challenging, but the goal is achievable. There are success stories of systems change within educational settings documented in professional literature (Hoyle et al., 2008; Stichter et al., 2006). Critical elements to systems change include a dedicated team of professionals, a systematic plan, data collection and monitoring, and a plan for sustainability. Additionally, small accomplishments along the way to achieving the larger goal must be recognized. Capacity building requires behavior change in all professionals responsible for implementation of EBIs in a school setting. The result of a system change of this nature is an improved educational system for adolescents with an ASD.
### Research-Supported Treatments – Teacher Report Form

This table identifies treatments for Autism Spectrum Disorders that have been shown to be effective through research. We would like to know more about your knowledge and use of these treatments. Please check the box for the statement that most accurately describes your level of familiarity or competence with each of these ASD treatments.

The last item is for teachers to identify appropriate staff. Please use the back of this form if you need additional room.

<table>
<thead>
<tr>
<th>Antecedent Package</th>
<th>Behavioral Package</th>
<th>Comprehensive Behavioral Intervention for Young Children</th>
<th>Joint Attention</th>
<th>Naturalistic Teaching Strategies</th>
<th>Peer Training Package</th>
<th>Pivotal Response Treatment</th>
<th>Schedules</th>
<th>Self-Manage</th>
<th>Story-Based Intervention</th>
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<tbody>
<tr>
<td>I am not familiar with this treatment.</td>
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<td>I know how to use this treatment but have not used it before.</td>
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<td>I know the “basics” about this treatment but could not explain it to others.</td>
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<td>I know this treatment well enough to teach others the “basics.”</td>
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<td>I could implement this treatment tomorrow.</td>
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<td>I could teach someone to implement this treatment.</td>
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<td>I have used this treatment in the past.</td>
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<td>I have data to show that I can accurately implement this treatment.</td>
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<td>The following people can accurately implement this treatment in my classroom.</td>
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</table>

**Other Treatments:** You may accurately implement treatments that are not identified on this form. Please identify any additional treatments for which you could provide training to others in the school system.

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### References


*Psychology in the Schools*  DOI: 10.1002/pits


