Evidence-Based Practices and Students With Autism Spectrum Disorders

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The past several years have been witness to a variety of education reform and reorganization efforts, including for students with disabilities. Prominent among these restructuring efforts have been initiatives that require educators to adopt practices that are supported by research. Noteworthy examples of this trend include the No Child Left Behind Act of 2001 and other calls for use of effective practice methods by educators and others who are connected with students with disabilities. Although this is a daunting challenge for any group of students, the process of identifying and consistently and correctly using effective practice methods has been especially demanding for professionals who work with children and youth with autism spectrum disorders. This article discusses issues and factors that relate to identifying and using effective practices with students with autism-related disorders. Recommended effective practice methods are also provided.

Signed into law in January 2002, the No Child Left Behind Act of 2001 (NCLB) is an ambitious congressional attempt "to ensure that all children have a fair, equal, and significant opportunity to obtain a high-quality education, and reach, at a minimum, proficiency on challenging state academic achievement standards and state academic assessments" (NCLB, 2002). Included in the noteworthy, standards-based NCLB enactment is the expectation that all students, including those with disabilities, will demonstrate annual yearly progress (AYP) and perform at a "proficient" level on state academic assessment tests. The means, suitability, and even the sensibility for accomplishing these lofty goals are under intense debate (Albrecht & Joles, 2003; Allbritten, Mainzer, & Ziegler, 2004; Center on Educational Policy, 2003). Algozzine (2003), for example, observed that federal control is being exerted through discretionary and other incentives to state and local education agencies, even though the U.S. federal government has no designated power to manage education. Yet, independent of these debates, there is general agreement that improving students' performance and outcomes is an important and necessary endeavor. Moreover, increasingly there is a perception that improved student outcomes will be most likely to occur within a restructured education system (Egnor, 2003; Robelen, 2002).

Education restructuring includes teachers' willingness and ability to adopt and properly use effective-practice materials and strategies (Lerman, Vorndran, & Addison, 2004). Indeed, a salient element of NCLB relates to using effective education practices developed from scientifically based research (SBR). Such practices are defined as those that have met rigorous peer review and other standards and that, when consistently and reliably applied with fidelity, have a history of yielding positive results (Simpson, LaCava, & Graner, 2004).

The call for effective and scientifically supported methods for use with students with disabilities extends beyond NCLB and other legislative and policy statements (Odom et al., 2005). This appeal has been particularly trumpeted within the field of autism spectrum disorders (ASD; National Research Council, 2001). Demands and pleas for adoption of effective practices for children and youth with autism and related disabilities are connected, at least in part, to the significantly increased prevalence of ASD (American Psychiatric Association, 2000) and a longstanding tradition and legacy of accepting, condoning, and even promoting methods and strategies that lack efficacy and proven utility (Gresham, Beebe-Frankenberger, & MacMillan, 1999; Simpson, 2004). This article addresses several issues connected to identifying and using scientifically supported and effective-practice methods with students with ASD. Effective practices for students with ASD are identified.

Controversial Interventions and Treatments for Students With ASD

Notwithstanding noteworthy advancements in treating and understanding individuals with ASD, autism-related disabilities remain largely inexplicable (Frith, 2003). Thus, in spite of crucial and meaningful gains in information about ASD and

procedures and intervention strategies that benefit individuals with ASD, persons with autism-related disorders remain an enigmatic group. Highly unique and idiosyncratic characteristics associated with ASD, manifestation of irregular and occasionally even advanced skills that accompany diagnoses of autism, and a remarkably increased prevalence of ASD (American Psychiatric Association, 2000; Autism Society of America, 2005) are only a few of the factors that have fueled significant debate about which treatment and intervention choices are most apt to lead to favorable outcomes (Prizant & Rubin, 1999).

Furthermore, related to its perceived distinctiveness and inimitability and because autism is considered to be a life-long, permanent disability, autism-related disabilities have attracted a number of highly controversial treatments and intervention strategies (Bettelheim, 1967; Biklen & Schubert, 1991; Sillman, 1995). In this context, *controversial* is a reference to unvalidated methods and strategies for which there is little in the way of scientific support and efficacy, especially when extraordinary and incomparable results are promised (Simpson & Myles, 1998).

Effective and Scientifically Valid Interventions and Treatments for Students With ASD

Persons associated with children and youth with autism and autism-related disorders are not exclusive in their struggle to sort between effective and ineffective interventions and treatments and to identify the salient components of an effective program. Indeed, no area of disability has managed to escape the difficulties associated with controversial and unsupported treatments and interventions (American Speech-Language-Hearing Association, 2004). Yet, no area of disability has experienced this problem to the same degree as those within the autism field. Parents and professionals connected to children and youth with ASD have been singularly and exceptionally prominent in their willingness to consider and advocate use of unproven and controversial interventions and treatments, including strategies and methodologies that supposedly lead to attainment of skills, knowledge, and progress that are well beyond those characteristically found with established effective-practice methods (Heflin & Simpson, 2002; Volkmar, Cook, & Pomeroy, 1999a). That some of these methods are promoted to result in rapid, all encompassing, and dramatic improvements, or to actually restore an individual with an autism-related disability to normalcy, has been particularly problematic.

The appeal and lure of overvalued and unvalidated interventions and treatments are both explicable and arguably even logical. Consider and identify with the parents of children with autism: These individuals are confronted with raising children who have been identified with a life-long pernicious disability

for which there is neither a clear explanation nor a universally accepted course of treatment. When confronted with opportunities and options that purport to lead to significantly improved outcomes, even if the techniques that are being considered lack scientific validation, it is understandable that many parents, as well as numerous professionals who work with these children and youth, are willing to consider and even forcefully advocate for approaches that promise improved outcomes or to restore an individual to normal functioning. Kalb (2005) poignantly makes this point in a *Newsweek* feature article on autism, commenting on one family's search for treatments: "Since their sons were diagnosed [with autism], both at age 2, Barry and Dana Craven have tried a dizzying array of therapies: neurofeedback, music therapy, swimming with dolphins, social-skills therapy, gluten-free diets, vitamins, anti-anxiety pills and steroids" (p. 45).

In spite of the comprehensible reasons for the current intervention and treatment dilemma, it is nonetheless painfully evident that unrestricted use of and reliance on untested methods, especially those that promise extraordinary results, have been detrimental to the ASD field. Gullible and uncritical acceptance of interventions and treatments that promise phenomenal results and acceptance of unvalidated methods and strategies that capriciously and naively supplant proven strategies have undermined wide-reaching identification, correct implementation, and prudent evaluation of methods that bode best for children and that may be the prerequisite foundation for effective programs for students with ASD. In short, dependence on and uncritical use of miracle cures and unproven methods have encouraged unhealthy, unrealistic, and improbable expectations and have, in all too many cases, retarded the progress of students with ASD.

The apparent solution to this dilemma is to identify and use scientific methods and evidence-based practices (Shavelson & Towne, 2002). This clear-cut and evident answer is appealing and has obvious value. Yet its implementation is fraught with Herculean challenges. Regarding using a science-oriented strategy for identifying and adopting evidence-based methods, Odom and his colleagues sagely observed that "the 'devil is in the details'" (Odom et al., 2005, p. 137). To be sure, there are significant difficulties and a lack of consensus regarding how best to identify, use and evaluate scientifically valid and effective practices (U.S. Department of Education, 2003).

NCLB has prominently and aggressively supported the use of SBR in selecting educational practices. Mentioned more than 100 times in NCLB, SBR is defined as "research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs" (NCLB, 2002). Accordingly, NCLB has identified effective SBR practices as those that have met thorough and particular standards and that have reliably yielded positive results when applied in the approved manner. Rigorous peer review policies and strategies are the preferred means for testing and confirming that practices are

scientifically based. More specifically, scientifically based practices include products and materials validated by means of research designs that use random samples and control and experimental groups. This model of research is considered by NCLB to be the "gold standard." For a variety of sound reasons, however, randomized control group designs are infrequently used in research involving children and youth with autism-related disorders. This narrow interpretation of what is scientifically valid has broad and significant implications related to endorsing intervention and treatment practices for children and youth with ASD.

Smith (2003) attempted to explain NCLB's narrow interpretation of SBR by citing the U.S. Department of Education's *Questions and Answers on No Child Left Behind: Doing What Works*, a guidance tool for parents and educators:

> To say that an instructional program or practice is grounded in scientifically based research means there is reliable evidence that the program or practice works. For example, to obtain reliable evidence about a reading strategy or instructional practice, an experimental study may be done that involves using an experimental/control group design to see if the method is effective in teaching children to read.
>
> [NCLB] sets forth rigorous requirements to ensure that research is scientifically based. It moves the testing of education practice toward the medical model used by scientists to assess the effectiveness of medications, therapies and the like. Studies that test random samples of the population and that involve a control group are scientifically controlled. To gain scientifically based research about a particular educational program or practice, it must be the subject of such a study. (p. 126)

The call for implementation of scientifically based practices was strongly promoted by the Coalition for Evidence-Based Policy (Council for Excellence in Government, 2002). On the basis of the argument that decades of stagnation in American education needed to be reversed through the promotion of evidence-based practices, the Coalition proposed, in 2002, that the U.S. Department of Education establish a knowledge base of validated educational interventions that have been proven effective in clinical trials using large-scale replication methods and create incentives for programs that receive federal education funds to use such interventions.

In August 2002, to facilitate the aforementioned validation process, the U.S. Department of Education awarded $18.5 million to the What Works Clearinghouse (WWC) to assess and report on effective programs (Eisenhart & Towne, 2003). Designed to be "a central, independent and trusted source of evidence about what actually works in education," the WWC was intended to provide information about reliable, scientifically based practices and supporting evidence from which educators could make choices. Because the WWC has posted few results of their investigation of products or practices, it is unclear whether they will be successful in this effort. This is particularly the case with students identified with ASD.

The WWC strategy for identifying SBR practices is the *Design and Implementation Assessment Device* instrument and a related protocol for ensuring that methods are scientifically verified (What Works Clearinghouse, 2004). The *Design and Implementation Assessment Device* and its related validation process are particularly controversial due to the requirement that evidence-based and SBR practices should be supported by randomized experimental group design methodology (White & Smith, 2002). Such research methodology has typically not been used to evaluate ASD methods, primarily because of limited samples of students with ASD with similar characteristics, programs, needs, and so forth. Moreover, it appears obvious that different research methodologies are needed to answer different questions (Horner et al., 2005; Shavelson & Towne, 2002). For example, identifying effective management interventions for highly idiosyncratic self-injurious behaviors of youth with severe forms of autism might best be undertaken using a single-subject design validation approach. Similarly, a possible environmental or educational link associated with certain outcomes might best be identified using correlational methods (Thompson, Diamond, McWilliam, Snyder, & Snyder, 2005). Accordingly, using a variety of methodologies to identify effective practices for students with ASD appears to be the most sensible and pragmatic path for the ASD field to follow. At the same time, even though there is controversy regarding the precise means of determining scientific evidence, there is an obvious need for professionals and parents to be able to identify effective methods for students with ASD (Browder & Cooper-Duffy, 2003; National Research Council, 2001; Volkmar, Cook, & Pomeroy, 1999b).

In summary, the SBR requirement of NCLB appears to restrict and impede identification of effective practices for students with ASD. Research involving students with ASD often precludes use of randomized group design methodology because of limited student samples, heterogeneous clinical educational programs, and the need for flexibility in matching research designs to specific questions and issues under investigation. The National Research Council (2001) recognized that there are important occasions when randomization is not feasible. Furthermore, Sailor and Stowe (2003) correctly observed that "No Child Left Behind and accompanying education legislation at the federal level . . . has begun to not only inform inquiry, but also to restrict it" (p. 151). Algozzine (2003) furthered this line of reasoning by observing that government control of discretionary funds and other incentives allows the government to wield power over state and local education agencies, institutes of higher education, and any other individuals who must comply with NCLB, thus effectively impeding the very goal that NCLB pursues: the identification of scientifically valid methods for all students, including those with ASD. Finally, Eisenhart and Towne (2003) prudently called for more dialogue among individuals involved in the NCLB SBR debate, perceptively noting that "more of it" is an obvious need (p. 35).

It is evident that identification of effective practices for students with ASD extends far beyond NCLB. Indeed, professionals and family members must ultimately determine whether a particular strategy or method that is deemed to be an effective or scientifically based method is suitable for an individual student. Accordingly, the onus for making responsible methodology decisions falls with teams of professionals and parents. Professionals and parents require access to straightforward information about the efficacy of various methods, as well as supplementary information that will assist them in determining a method's suitability with individual students. Moreover, it is essential that the professionals and parents who are making decisions about which methods to use demonstrate a willingness and ability to use this information in a collegial and collaborative fashion. There appears to be little doubt that the successful identification and implementation of effective practices will best be made at the local level by groups of professionals and parents who possess the most knowledge and information about individual students. Teachers, other professionals, and parents involved in the decision-making process must become better consumers of objectively verified and effective intervention methods available for use with children and youth with ASD.

Recommendations for Professionals and Parents

Based on work of Heflin and Simpson (1998), we propose the following recommendations for helping professionals and parents become better consumers of intervention methods for students with ASD and for deciding the suitability of various intervention options. Three basic questions can be used to facilitate selecting a program or method for individual students diagnosed with ASD:

1. What are the efficacy and anticipated outcomes that align with a particular practice, and are the anticipated outcomes in harmony with the needs of the student?

2. What are the potential risks associated with the practice?

3. What are the most effective means of evaluating a particular method or approach?

Question 1

The first question asks, What are the efficacy and anticipated outcomes that align with a particular practice, and are the anticipated outcomes in harmony with the needs of the student? This process involves assessing the merits of a particular approach, including what the approach purports or has been found to accomplish with persons with ASD or similar conditions. This is not a straightforward and undemanding process, at least in part because of the slapdash and ubiquitous use of such terms as *evidence-based, research-based,* and so forth. These terms are prominently displayed on the Web sites, in the catalogs, and in the brochures of companies that sell educational and psychological materials, which is clear testament to this problem. Just because a brochure indicates that a particular method is supported by research does not make it so. Practitioners and others who recommend a particular material or method must have an understanding of its utility and underlying scientific support.

Determining whether a method is objectively verifiable is essential. Thus, as outlined in NCLB, interventions and treatments for students with ASD must demonstrate their worth. They must pass rigorous and objectively measured standards and demonstrate value by producing positive outcomes when used correctly. It, however, is also strongly recommended that the autism community recognize that *objectively verifiable* is not limited to a single form of supporting research and efficacy. That is, "rigorous, systematic, and objective procedures" that recognize "reliable and valid" (NCLB, 2002) interventions and treatments can take multiple forms (e.g., single-subject designs, correlation studies, quasi-experimental designs), in addition to research designs that have random samples and control and experimental groups. The salient issue in judging the merits of a particular method is whether there is objectively verifiable supporting evidence that is appropriate for the issue, circumstances, and conditions that are under investigation. Objectively verifiable supporting information and data in the form of high-quality studies in peer-reviewed journals are unquestionably vital and necessary. Although non–peer-reviewed materials on Web pages and other briefly written, easily read, and effortlessly and convenient information has clear appeal, these sources of support often lack the credibility, objectivity, and impartiality of more traditional forms of research information. Information from a single source that is not supported by other researchers and entities and information that lacks peer review and empirical validation but instead comes primarily from personal testimonials should be considered with caution. Furthermore, many objective and peer-reviewed research reports are available via Internet sites (see, for example, Pyramid Educational Consultants, 2005).

In addition to an evaluation of the overall effectiveness and usefulness of a method, the assessment process must include an appraisal of the extent to which the outcomes associated with an approach align with the needs of an individual student. Furthermore, it is recommended that product or procedure consumers consider the extent to which supporting research was conducted with students who are similar to the student for whom the product is being considered. A severely impaired child with limited language, for instance, may be a poor candidate for a scientifically supported method that primarily focuses on pragmatic social language outcomes and that was validated using high-functioning students with intact expressive verbal communication skills.

Assessment of the suitability of a method should also include an evaluation of its potential social validity (Maag, 2004; Wolf, 1978). Given the multiple and pervasive challenges fac-

ing children and youth with ASD, it is essential that maximally significant targets be addressed and that these targets have pivotal importance. Because individuals connected to students with ASD may have differences of opinion, it is recommended that this process be undertaken by multiple individuals who have varied perspectives, including parents and family members, students, teachers, and so forth. Indeed, the social validity associated with matching interventions to perceived needs and desired outcomes is by its very nature weighted in unity with individuals' subjective and personal opinions, attitudes, and perceptions of the objectives, outcomes, procedures, and cost effectiveness of potentially using a particular method. Moreover, because social validation is predictably slanted toward individuals' perceived notions of practical and pragmatic relative benefits, such as quality-of-life factors, social validity should be considered relative to its perceived practical benefit, rather than judged solely on the basis of quantitative or empirical scientific findings. It is important to remember, however, that social validity is most effective when combined with a consideration of quantitative and other objectively verified information, when intervention targets address basic and salient needs of students with ASD (i.e., social interaction, communication/language, behavioral) and when multiple judges who hold different stakeholder positions are independently permitted to offer their subjective evaluative and perspective input. Although social validity in no way is a replacement for more objective and empirical evaluation of a method or procedure being considered for use with a student with ASD, it does augment the methodology evaluation and selection process by adding components that otherwise might be neglected.

Question 2

The second question asks, What are the potential risks associated with the practice? This query includes consideration of any possible negative outcomes or side effects associated with using a method, including health, behavioral, and quality-of-life risks for a student. It also includes consideration of potential parent- and family-related quality-of-life considerations. For example, a family considering implementation of a highly intensive and long-term discrete trial training method with a young child with autism should be assisted in considering the cost, time, and possible effect on the family of implementing such a program.

This question also includes consideration of what options would be excluded if a particular method were to be adopted. Teams of professionals and parents do not have unlimited amounts of time and opportunities to work with children and youth with ASD. Accordingly, adoption of a particular method often means that an alternative approach cannot be used. Hence, pragmatic and realistic consideration of intervention methods requires that teams of parents and professionals carefully compare methods and strategy options and consider the consequences of dropping one alternative in favor of another.

Question 3

The third question addresses how a method or strategy will be evaluated. This involves considering the process and procedures that may be used to determine whether a particular method is able to produce desired and anticipated outcomes. It also involves evaluating negative outcomes and undesired side effects that may result from using a method.

By its very nature, declaring that a method is an objectively verified effective practice involves evaluation. Consumers of these methods are urged to judge them on both the basis of the reported scientific merits and the demonstrated utility with individual students. It is insufficient to accept that a methodology is an objectively verified effective practice solely on the basis of published or reported research results. Equally important is determining, via ongoing data collection, whether the method results in positive outcomes with individual students.

The evaluation process with individual students includes three basic considerations: (a) How will the method be evaluated, including how will student progress be demonstrated? (b) Who will carry out the evaluations, and to whom will the results be provided? and (c) How frequently will an evaluation of an intervention occur? Although the process appears mundane and conventional, specification of these elements will structure and clarify the crucial evaluation process for various stakeholders.

Specifying the criteria that will be used to determine whether an intervention or treatment is effective and whether the method should be continued also is an essential element of the assessment process. That different individuals associated with students with ASD will have different expectations and perceptions related to the meaning of success, positive outcome, and so forth is to be expected. Accordingly, clarification of at least the broad parameters of standards and criteria by which a procedure will be judged is vitally important.

Current Best Practices for Students With ASD

Clearly there is a decided and dramatic need for identification and use of scientifically based and effective practice methods. Positive and expected outcomes occur when knowledgeable and skilled professionals, in collaboration with parents and families, use methods that have objectively verified efficacy. As anyone who has ever worked with a student with an ASD can attest, however, successful outcomes require not only that an effective method be chosen but also that it be properly matched to the needs of a particular student and the planning team. Furthermore, the strategy can be expected to work effectively only if it is correctly applied by a knowledgeable professional or group of professionals. Indeed, without treatment fidelity, wherein methods are correctly, consistently, and carefully implemented using all prescribed practices, procedures, steps, and techniques required for promised results, even the

most effective technique will likely be unable to deliver expected outcomes (Cook & Schirmer, 2003; Detrich, 1999; Lang & Fox, 2003).

It is also increasingly evident that there is no single best-suited and universally effective method for all children and youth with ASD. The best programs appear to be those that incorporate a variety of objectively verified practices and that are designed to address and support the needs of individual students and the professionals and families with whom they are linked (National Research Council, 2001; Olley, 1999).

The field of ASD is unmistakably in its infancy stage, but there are basic intervention and treatment methods that appear to have the capacity to serve as the foundation for successful educational programs for students with ASD. As previously noted, effective practices are ultimately those that are systematically and objectively verified, are used with fidelity, and are tailored to fit the individual needs of students. In this context, the following methods were evaluated solely on the basis of their perceived objective, scientific, and effective-practice merits. The ultimate utility of these interventions and treatments is a function of their alignment with the needs of individual students, as well as program planners and implementers, and the extent to which they are used in the prescribed fashion by appropriately trained, knowledgeable personnel.

The reviews are based on work undertaken by Simpson et al. (2005). This team evaluated 33 commonly used interventions and treatments for children and youth with ASD. They organized the methods into five categories: interpersonal relationship, skill based, cognitive, physiological/biological/neurological, and other. In addition to describing each ASD method, their intervention and treatment evaluations included the following considerations: (a) reported outcomes and effects; (b) qualifications of persons implementing the intervention or treatment; (c) how, where, and when the intervention or treatment is best administered; (d) potential risks associated with the intervention or treatment; (e) costs associated with using the intervention or treatment; and (f) methods for evaluating the effectiveness of the method. On the basis of these factors, the 33 interventions and treatments were graded as falling within one of four categories: (a) scientifically based, (b) promising practice, (c) practice having limited supporting information, or (d) not recommended (Simpson et al., 2005). *Scientifically based practices* were recognized as those that have "significant and convincing empirical efficacy and support" (p. 9). *Promising practices* were those methods that emerged as having "efficacy and utility with individuals with ASD" (p. 9), even though the intervention requires additional objective verification. *Practices with limited supporting information* were those that lacked objective and convincing supporting evidence but had undecided, possible, or potential utility and efficacy. The classification *not recommended* was used for interventions and treatments that were perceived to lack efficacy and that might have the potential to be harmful.

The results of the evaluation process are summarized in Table 1. As noted, no perceived *scientifically based practices* fell

in the interpersonal relationship, physiological/biological/neurological (prescription medications are not included), and "other" categories. Within the skill-based category, applied behavior analysis (Alberto & Troutman, 2003; Anderson & Romanczyk, 1999), discrete trial training (rated independent of applied behavior analysis; Maurice, Green, & Luce, 1996), and pivotal response training (Koegel, Koegel, Harrower, & Carter, 1999) were judged to meet the standard of *scientifically based practices*. This was also the case for *Learning Experiences: An Alternative Program for Preschoolers and Parents* (LEAP; Strain & Hoyson, 2000), which was included in the cognitive category. Two options, holding therapy (Welch, 1988) and facilitated communication (Biklen, 1993; Biklen & Schubert, 1991) were perceived to meet the criteria for the *not recommended* classification (i.e., they were judged to lack efficacy and had the potential to be harmful).

Although important efforts were made to ensure impartiality and objectivity, the evaluations, as with similar projects (National Research Council, 2001), were likely affected to some extent (albeit unknowingly) by the reviewers' perceptions and experiences. Similar undertakings of this nature will, in all likelihood, reflect the overt and unconscious biases of the persons who make the judgments. Yet, in spite of the inherent partiality and bias that accompany methodology assessments, this process is crucial. Indeed, the field will be unable to move forward unless it first prudently and systematically undertakes the difficult task of identifying objectively verifiable methods and strategies that have the greatest probability of producing desired outcomes with students with autism-related disabilities. Complete agreement and total consensus will likely never be achieved. Nevertheless, the development of methodology evaluation processes focused on identifying objectively verifiable effective methods bodes well for students with ASD and is a crucial first step in moving the field to a point of basic agreement on methods and procedures that should be in place for all students.

Initial steps have already been taken in this direction. For example, the Committee on Educational Interventions for Children with Autism, Division of Behavioral and Social Sciences and Education, National Research Council (2001) identified a list of general characteristics perceived to be associated with effective educational programs for children with ASD:

> early [age] entry into an intervention program; active engagement in intensive instructional programming for the equivalent of a full school day, including services that may be offered in different sites, for a minimum of five days a week with full-year programming; use of planned teaching opportunities, organized around relatively brief periods of time for the youngest children (e.g., 15–20 minute intervals); and sufficient amounts of adult attention in one-to-one or very small group instruction to meet individualized goals. (p. 6)

These preliminary and basic recommendations now must be expanded, confirmed, and refined, and specific methodologies must be subjected to well-thought-out and objective

TABLE 1
Evaluation of Interventions and Treatments for Learners With Autism Spectrum Disorders

	Intervention and Treatment Categories				
Classification	Interpersonal relationship	Skill-based	Cognitive	Physiological/ biological/ neurological	Other
Scientifically based practice		• Applied behavior analysis (Hagopian, Crockett, van Stone, DeLeon, & Bowman, 2000) • Discrete trial teaching (Committee on Educational Interventions for Children with Autism, 2001) • Pivotal response training (Hupp & Reitman, 2000)	• *Learning Experiences: An Alternative Program for Preschoolers and Parents* (Strain & Hoyson, 2000)		
Promising practice	• Play-oriented strategies	• *Picture Exchange Communication System* (Pyramid Educational Consultants, 2005) • Incidental teaching (Charlop-Christy & Carpenter, 2000) • Structured teaching (e.g., TEACCH; Panerai, Ferrante, Caputo, & Impellizzeri, 1998) • Augmentative alternative communication (Ogletree, 1998) • Assistive technology (Tjus, Hinmann, & Nelson, 2001) • Joint action routines (Prizant, Wetherby & Rydell, 2000)	• Cognitive behavioral modification (Zirpoli, 2005) • Cognitive learning strategies (Bock, 1999) • Social stories (Rogers & Myles, 2001) • Social decision-making strategies (Myles & Simpson, 2003)	• Sensory integration (Case-Smith & Bryant, 1999)	
Limited supporting information for practice	• Gentle teaching (Fox, Dunlop, & Busch-baker, 2000) • Option method (e.g., Son-Rise program; Option Institute and Fellowship, 2004) • Floor time (Greenspan & Wieder, 2000) • Pet/animal therapy (McKinney, Dustin, & Wolff, 2001) • Relationship development intervention (Gustein & Sheely, 2002)	• Van Dijk curricular approach (MacFarland, 2001) • Fast ForWord (Gillam, Loeb, & Friel-Patti, 2001)	• Cognitive scripts (Krantz & McClannahan, 1998) • Cartooning (Rogers & Myles, 2001) • Power cards (Gagnon, 2001)	• Scotopic sensitivity syndrome: Irlen lenses (Griffin, Christenson, Wesson, & Erickson, 1997) • Auditory integration training (Mudford et al., 2000) • Megavitamin therapy (Adams & McGinnis, 2001) • Feingold diet (Tsai, 1998) • Herb, mineral, and other supplements (Tolbert, Haigler, Wairs, & Dennis, 1993)	• Music therapy (Brownwell, 2002) • Art therapy (Kornreich & Schimmel, 1991)
Not recommended	• Holding therapy (Waterhouse, 2000)	• Facilitated communication (Perry, Bryson, & Bebko, 1998)			

Note. Adapted from Simpson, R., de Boer-Ott, S., Griswold, D., Myles, B., Byrd, S., Ganz, J., et al. (2005). *Autism spectrum disorders: Interventions and treatments for children and youth.* Thousand Oaks, CA: Corwin Press. Used with permission of Corwin Press.

assessment. It is highly likely that time will confirm that there are no universally effective strategies and methodologies and that individual students will respond differently to different strategies. Yet, if basic elements of effective programming are not incorporated into interventions and treatments and programs are not based on objectively verifiable effective methods, children and youth with ASD will fail to achieve outcomes that fully reflect their capabilities.

Summary

Children and youth with ASD have noticeably poor prognoses compared to other groups of students with disabilities. They also have the dubious distinction of regularly and commonly being exposed to intervention and treatment programs and strategies that lack efficacy and demonstrating relatively poor responses to intervention and treatment efforts. Accordingly, there is an unmistakable need for objectively verifiable effective methods that can serve as the underpinning for every student's program. This process will be complicated and at times tedious, it will be encumbered and affected by political and legislative actions, and it will likely never result in total consensus. Yet, the need to identify effective methods is so important that the field will not be able to move forward without significant progress in this area.

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