

Matching Children on the Autism Spectrum to Classrooms: A Guide for Parents and Professionals

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Abstract Meeting the needs of a learner with an autism spectrum disorder requires specialized expertise. Assessing the extent to which a potential program or classroom meets a child's needs is a source of serious challenge for parents and professionals alike. Indeed, identifying, prioritizing and agreeing upon the child's needs are complex questions for which there are no clear and straightforward answers. The process of establishing a match between a student and a placement must explore several primary dimensions: child, setting, and instructor variables, treatment philosophy and strategies, assessment and evaluation, and family needs and involvement. Additionally, there is a great deal of complexity considering how to interpret, integrate and apply empirical research findings and prominent professional opinions to develop sound and practical solutions. Discussion and agreement about the importance of each of these factors and how they apply in a specific situation forms the foundation of an interactive dialogue between service providers and families to create a "best fit" between student and program.

Keywords Autism · Education · Placement · Intervention

Every child is entitled to an appropriate education. When a child has a diagnosis of an autism spectrum disorder

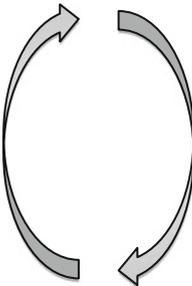
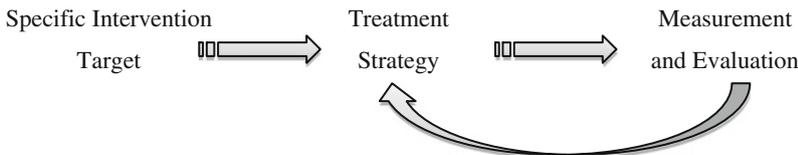
(ASD), meeting that need is complex. Both families and school administrators have to grapple with the question of the most suitable placement. In some countries differences of opinion between families and schools about placements are resolved in a court of law at a financial and emotional cost to both sides while in other countries a tribunal or an appeals system may be used to resolve disputes. It is important for parents to know the appropriate way to resolve a difference of opinion about a placement decision within their own educational system. All of the people involved, and most especially the child, would be best off if there were quality placements meeting the needs of the broad array of children on the spectrum.

However, the answer to the question, "What is the best match for this particular child?" is not based solely on a child's skills and behavioral profile or a particular treatment model, and is not easily extrapolated from the available research. A "good fit" involves compatibility of a child's characteristics and family context, and the values of both the family and school. What follows in the current article is an overview which may form common ground for schools and parents to articulate their goals, questions and concerns about a student; develop treatment priorities; identify evidence-based teaching strategies; and make plans for monitoring the child's improvement and progress toward the identified outcomes.

In the current article we propose a model which encompasses four levels of consideration for parents and professionals to address when making placement decisions for a child. These levels are: 1. Compatibility of ideology and values; 2. Evaluating quality indicators and evidence; 3. Identifying a relationship between child, family and placement characteristics; and 4. Matching specific goals and targets to treatments and measurement (See Table 1).

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Table 1 Levels of decision making

1: Values and Philosophy		
Underlying Assumptions of Treatment Approach Social Validity of Treatment Approach Empirically Based Methods		
2: Evaluating Quality Indicators and Evidence		
Evidence-Based Treatment Staff Training and Expertise Intensity of Treatment Outcome Research Limits of Outcome Research		
3: Child and Family Specific Characteristics and Needs		
<i>Child/Family Variables</i> Chronological Age Intelligence Severity of Core Symptoms Behavioral Difficulties Social/Communication Difficulties Executive Functioning Family Stress and Values		<i>Setting Variables</i> Inclusion Opportunities Intensity Curricular Focus and Scope Available Resources and Services
4: Targeting Individual Outcomes: Matching Child Goals and Strategies		
		

Level 1: Values and Philosophy

Underlying these decisions are assumptions about the child’s potential, and expectations and priorities regarding the focus of education. Although the ultimate goal of educating children with autism, or all children, is personal independence and social responsibility (National Research Council 2001), individual outcomes and the manner in which they are achieved varies greatly. Furthermore, there may be differences in ideology which impact a family or professional viewpoint about what is ultimately possible or best for their child. For example, some treatment approaches (such as Applied Behavior Analysis) may seek to help an individual with autism become indistinguishable from his or her peers to whatever extent possible (Kazdin 2001). In contrast, other approaches such as TEACCH directly foster a respect and acceptance of the “culture of autism”

(Mesibov et al. 2005). Such fundamental differences in ideology affect the underlying goals of these treatment approaches, and establish implicit priorities which may be radically different. The extent to which professionals and families share the same general ideology will affect the placement match at the broadest level. Authors such as Cherniss and Krantz (1983) suggest that identifying with a formal ideology is important in establishing common goals and focus, and can be helpful to ensure shared commitment in the face of difficult decisions.

Despite fundamental and ideological differences, approaches may share common goals and values. For example, ABA and TEACCH share in common a respect for the impact of the learning environment, consideration of the antecedents of behavior, and target useful functional skills and effective communication (Mesibov and Shea 2010). Further, they both have high social validity in the eyes of

teachers and parents (Callahan et al. 2010). Similarly, Callahan et al. (2008) surveyed parents, teachers and school administrators and found consistent support for five shared values in education for individuals with ASD. These values include: ensuring the instruction is individualized, collecting data to assess progress, using empirically-based teaching methods, collaboration among members of an interdisciplinary team, and planning for long term goals. These authors urge that the shared values be used to improve public school education for children with ASD.

We think about these kinds of values as providing the first level of a match between children on the autism spectrum and a potential classroom. While this does not provide a guarantee, identifying these factors and explicitly discussing them will increase the likelihood that the parent and program can establish common goals for the student.

Level 2: Quality Indicators

Beyond seeking a philosophical match between a potential placement and the values and goals of a family and student, appropriate placement decisions must consider what is known about factors that reflect quality programs for children with autism. Parent and school knowledge of quality indicators that have been identified in the research literature and consideration of how these variables apply to a specific child will lead to the most productive placements. An exhaustive discussion of program quality indicators and the status of the research to support them is beyond the scope of this article; however, there are other sources for such comprehensive reviews (e.g., National Autism Center 2009; National Research Council 2001). Quality indicators span treatment and staff characteristics.

Treatment Strategies

There are good educational strategies to address the broad array of needs demonstrated by people with ASD (e.g., Handleman and Harris 2006; National Autism Center 2009). Decades of research have allowed us to develop and use evidence-based educational methods as well as providing meaningful quality indicators for programs serving individuals with autism (e.g., Crimmins et al. 2001). For example, research supports the need for a minimum 25 h of intervention per week for 12 months per year; individualized attention on a daily basis (to ensure progress), focus on spontaneous communication, instruction in and coordination across home, school and community settings, and proactive approach to challenging behaviors.

What is lacking however is a significant body of research allowing us to match individual children to each

specific evidence-based intervention. In other words, quality indicators can help ensure that a setting or treatment has the elements that have been shown to be associated with the success, but do not give the necessary information about how to apply these elements in a specific child's situation.

Even the best known and most influential comparative outcome studies are not 100% effective in achieving a single best outcome for all of the participants. Lovaas' (1987) study of the treatment of preschool aged children using intensive ABA intervention achieved a favorable outcome for 47% of the experimental group. Similarly, Sallows and Graupner (2005) reported that 48% of their young participants showed rapid learning with ABA instruction. The changes in preschoolers who made the greatest gains in these studies are heartening, but with half of the children failing to make such major gains we need to identify other strategies that may enhance the learning of the children whose progress was more limited.

Furthermore, not all outcome studies of early and intensive behavioral intervention in other settings and models have achieved the same level of results (e.g., Anderson et al. 1987; Bibby et al. 2002; Magiati et al. 2007). This is not intended to diminish the value of these studies. They moved the treatment of children with autism forward in a dramatic way. In fact, recent meta-analyses (Eldevik et al. 2009; Reichow and Wolery 2009) suggest that early behavioral intervention generally leads to important improvements in IQ and adaptive behavior for most children with autism. But the question of the optimal child/program match remains to be answered.

Ideally we would have a broad array of strategies available to help each child make optimal progress. Although researchers have reported predictor factors that describe who ultimately benefited most from their interventions, these studies tell us nothing about how the more moderate outcome children would have done in a setting that used different instructional strategies. Even some of the best outcome children might have benefitted from different instructional methods for some of the skills they had to master.

As such, the information gleaned from outcome studies and incorporated in summary documents of ASD program quality indicators is not prescriptive for the individual child. Relying on broad statements from outcome studies leads to broad generalizations from a large, complex collection of studies. Integrating these findings into an educational plan for an individual child is not simple. The outcome research, vital as it is, is not able to generate a detailed educational plan that targets the specific needs of each learner. It is the child's personal educational plan that must consider a specific child's characteristics and needs and consider the available setting and teaching variables to customize a program for the learner.

There is very limited research trying to match children to specific treatments. For example, Sherer and Schreiber (2005) developed behavioral profiles of six children with ASD, three of whom responded to Pivotal Response Training and three of whom did not. Children who fit the “responder” profile before treatment made progress with that intervention, while children who matched the “non-responder” profile did not. Examples of matching variables where the children differed during pre-treatment assessment included the responders engaging in more toy play and less avoidant behavior than the non-responders.

This research hints at the potential for being able to do precise matches of treatments for learners, but the data are too limited to be of immediate practical value on a large scale and the study did not examine the benefit of alternative teaching strategies for the non-responders. In the absence of such research parents and professionals must make treatment decisions based on the child’s response to initial assessment data and intervention with on-going data-based monitoring of progress. Thus, initial decisions about an educational plan are part of the treatment planning process, but the process does not stop when that document is completed. Rather, teachers and parents need to be open to trying various interventions until they identify strategies that work for a specific learner. This is the critical process in ensuring an appropriate placement and treatment plan, and in highly effective programs serving children with ASD it happens all the time.

Staff Characteristics

The complex and varied presentation of ASD requires specialized training and expertise, which may not occur within standard training in regular and special education. Schools should seek consultation and training services specific to autism, hire experienced staff, and support their work with quality supervision (National Research Council 2001). One-time training or historical knowledge and experience are not sufficient for a staff member to remain “state of the art.” The commitment to training must be ongoing and reflect progress in the field. Even proven intervention models may be expanded or augmented by the integration of new techniques and strategies.

Level 3: Child and Family Specific Characteristics and Needs

Child Variables

A more specific level of matching a particular learner to a classroom with characteristics most suited to his or her needs starts with careful consideration of the learner. The

term ASD includes an array of people with markedly different educational needs (Harris 2007). These dimensions of difference include intellectual ability; severity of autistic symptoms including communication, resistance to change, and social skills; chronological and developmental age; the presence of challenging behaviors such as tantrums, aggression or intrusive stereotypic behaviors; and the specific skill sets of each child. There is research to support general placement considerations based on these factors.

Chronological age is an obvious variable in making an appropriate placement. The research suggests that the earlier intervention is provided the better the potential outcome. Much of the outcome literature has been done with preschool aged children (e.g., Eikeseth et al. 2002; Lovaas 1987; Smith et al. 2000) or most recently, infants and toddlers (e.g., Rogers and Dawson 2010). Harris and Handleman (2000) found a correlation between early age at initial intervention and placement in a mainstream setting after preschool.

The severity of expression of the core symptoms of ASD also can influence a placement decision. A child who poses serious behavior management issues, engages in many rigid routines, has very limited cognitive skills and/or appears indifferent to other people may require a more specialized classroom setting than a youngster of average intelligence who poses few behavior problems, and shows some interest in other children. Eaves and Ho (1997) note that children who were older, less intellectually able, and exhibited more symptoms were more likely to be placed in special education classes than were younger, more able, and less symptomatic youngsters. On the other hand, many high functioning and mildly affected young people make good use of an inclusive educational setting to develop effective study skills and a sound corpus of knowledge. In such cases, academic achievements may also allow them to continue their education in college. By contrast a child on the lower end of the spectrum who has a co-occurring intellectual disability may only benefit from participating in some carefully selected inclusion experiences, and may require highly intensive services for her entire educational experience. This degree of variation among learners means that having an “autism” classroom in a school building may meet the needs of some children with ASD, but will not meet the needs of all (Eaves and Ho 1997).

The intellectual ability of a child with ASD is highly correlated with educational placement. Measures of IQ are predictive of overall academic achievement and placement following intensive preschool intervention (Eaves and Ho 1997; Harris and Handleman 2000). However, the research literature does not examine the effectiveness of the types of placements for children with ASD with intact cognitive skills. Cognitive ability may indicate a student’s ability to participate in a certain level of educational material

consistent with one's age peers, and most of these youngsters can learn in inclusive educational settings, but other significant needs are present, even in the absence of significant cognitive challenges.

Learners who exhibit dangerous or otherwise challenging and disruptive behavior may have fewer placement options available, as these serious needs frequently require extensive resources and expertise. Often, despite a learner's ability to participate in the educational or social experiences offered by a particular placement, his or her behavior may preclude a less restrictive setting.

Research has also documented the presence of executive functioning deficits in ASD (Ozonoff et al. 2005). These deficits may impede the general problem solving and organizational skills necessary to be successful and organized in school. However, despite universal acceptance of this deficit and need for attention to it in education settings, relatively little research has been generated to identify ways that this factor informs intervention for a best programmatic "fit" for the learner with an ASD.

Based on the diagnostic criteria, every person on the autism spectrum needs a great deal of support learning social skills. That teaching should start at an early age, continue throughout the educational experience, and often into adulthood (Lopata et al. 2010; Reichow and Volkmar 2010). It is important to consider that the presence of intact cognitive skills may make such social and behavioral difficulties less expected by others and the higher functioning student with ASD may experience negative evaluation by peers (e.g., Swaim and Morgan 2001) or teachers (e.g., Handleman et al. 2005). For example a young child who is verbal and of at least average IQ may be assumed to be disobedient by a teacher who does not understand that his non-compliance reflects a failure on the child's part to understand her directions. In a related vein, many youngsters who are integrated with peers report loneliness and challenges forming friendships, and navigating the non-academic aspects of school (e.g., Locke et al. 2010). While these deficits in social/behavioral domains may not be central to educational achievement, they are critical to a successful placement. The school needs to ensure that supports are in place to help children deal with the challenges they face in being part of a typical school setting.

Setting Variables

Information from the child's specific strengths and weaknesses as discussed above will give information about which classroom characteristics should be modified or put in place. Well-planned inclusion can be a powerful aspect of the education of a student with ASD (Ferraioli and Harris 2011). In public schools, typical peers are more accessible than in many specialized settings. However,

research indicates that proximity alone is insufficient to benefit children with ASD (e.g., Odom and Strain 1986). Schools must arrange meaningful inclusion opportunities suited to the specific needs of individual children with ASD in the school community. In a recent study, Rotherham-Fuller et al. (2010) examined the social experience of a group of elementary students with ASD in inclusive settings. These authors found that although almost half of the children had some engagement in peer networks, it was marginal and decreased in the higher elementary grades. Additional work needs to be done to identify strategies to improve these outcomes.

It is important for students with ASD to have classmates with skill sets and needs similar to, or complimentary to, their own. For example, Harper et al. (2008) used Pivotal Response Training with peer buddies who taught playground skills to two boys with autism. If a child is ready to learn shared play or conversation with peers, there should be responsive peers who can model and support that learning. Schools should balance the needs of both peers and children on the spectrum when making classroom assignments and parents need to inquire about how this balance is achieved.

Schools must also consider the impact on typically developing children of being in a setting with children with ASD who might be aggressive, have serious tantrums, and be in great need of teacher attention. Fortunately, models of peer mentoring and training show promise in supporting the development of important skills for students with ASD while also benefiting the children without ASD (Ferraioli and Harris 2011).

An appropriate level of intensity was discussed above as one of the key elements of quality educational programs for children with ASD (National Research Council 2001). How appropriate intensity is defined and achieved beyond a specified number of hours is critically important and may vary from child to child. Howard et al. (2005) found that simply clocking hours in the classroom is not sufficient for learners to make important gains. They compared the progress of young children on the autism spectrum who received 25–40 h a week of one-to-one applied behavior analysis (ABA) with a comparison group who experienced an eclectic approach mixing several different techniques and a mix of teaching ratios including some one-to-one, and some one-to-two for 30 h a week. The children who got 25–40 h a week of ABA had a better outcome than the children who had eclectic instruction. Thus hours in the classroom are not helpful if they do not provide intensity of instruction in a data-based approach to treatment.

Skilled staff members working with more than one student at a time may be able to create environments with high intensity learning, while some settings may provide 1:1 staffing without a focus on creating functional learning

opportunities. Providing intensity in the early years increases the likelihood that children will make sufficient progress to learn in a less intensive setting as they get older and in some cases to function well in a regular education class without support. One of the goals of a good education should be to prepare every student for as much independence as possible, and that means making individualized decisions about the need and appropriateness of a given staffing ratio.

Family Involvement

Research has shown that the most significant and enduring benefits of autism intervention are seen when parents are trained in teaching methods and involved in the child's education (National Research Council 2001). Schools are encouraged to be aware of the benefits of parent education and support in furthering educational goals. A variety of parent involvement models have been shown to be successful in teaching parents effective specific and general behavior change strategies and may significantly support greater generalization of skills outside of the school setting (e.g., Delmolino et al. 2009). Understanding different models of parent involvement and a family's values will lead to the best possible match for helping them meet the needs of their children with ASD. Encouraging the involvement of parents requires being sensitive to the extent of stress that most parents of children with ASD face (e.g., Delmolino et al. 2009). They are called upon to respond to the unrelenting needs of their child on the spectrum as well as trying to address the needs of the entire family. Similarly some siblings may resent the attention being paid to the child on the spectrum and feel ignored by their parents. The school also should be attuned to the structure of the family. A single parent family, a family where one parent is deployed overseas in combat, or a family who come from a non-western culture may all face a great deal of added stress (e.g., Shyu et al. 2010). Providing parents with the teaching skills they need to address their ASD child's behavior at home can make family life much easier.

Level 4: Targeting Individual Outcomes: Matching Child Goals and Strategies

At the most detailed level of consideration, specific strategies must be matched to specific goals and their outcomes at the individual child level. One of the most compelling and well documented examples of this process is found in addressing maladaptive behaviors of students on the autism spectrum. When a child exhibits a problematic behavior such as aggression, noncompliance, or self-injury a functional behavior assessment (FBA) must be done to

determine what factors are maintaining the behavior (e.g., Hanley et al. 2003). Not only is this a vital component of identifying an appropriate treatment strategy, in the United States it is a practice that is mandated and essential for best practice in the Individuals with Disabilities Education Act (PL-105-17). A well done FBA should identify the specific interventions that are required to help a learner replace maladaptive behaviors with more functional ones that enhance communication and increase the probability of more appropriate behavior.

Similar procedures can be applied to identify the most effective ways to support the development of skills in learners with ASD. For example, a well-trained teacher often does a short preference assessment at the start of every lesson to make sure she has information that will motivate the student in that session. In addition there are multiple ways to teach children to form discriminations among items, to produce useful sounds, to engage in pro-social behaviors, and so forth. The skilled teacher knows how to make gradual and appropriate increases in instructional demands to ensure the child continues to make good gains. Professionals or settings that adhere to a single teaching strategy in all situations are likely to do well with some children or goals, but fail with others.

Some of the most useful research on evaluating the impact of a given teaching strategy for children on the autism spectrum comes from rigorous single subject designs. Recent single subject research designs on teaching methods that have been shown to be effective in the education of children with ASD include teaching empathy skills (Schrandt et al. 2009); increasing diversity of responses among children with ASD (Napolitano et al. 2010); teaching children to raise their hand in class (Charania et al. 2010); using previously mastered tasks interspersed with new material when teaching labels (Volkert et al. 2008); and teaching children to request answers to novel questions (Ingvarsson and Hollobaugh 2010). These strategies are feasible for use in regular education classrooms and/or specialized classes for children with ASD in the public schools. However as Sherer and Schreibman (2005) demonstrated, what is effective for one child may not be for another, and the progress of individual learners must be monitored to evaluate the appropriate fit between learner, goal and strategy.

Data-based, theory driven interventions for ASD have varying amounts of evidence supporting their benefits. For example, ABA models of intervention involve direct measurement of teaching targets, and systematic application and evaluation of strategies informed by proven learning principles. ABA is used for all skill domains and across all environments, and spans a continuum from structured to naturalistic methods of instruction. Choice and evaluation of the effectiveness of programming

decisions should be informed by on-going data collection. If the teacher is uncertain about the interpretation of data or the best course of action her supervisor should have sufficient experience to help with decision making. The extent to which accurate and valid data are obtained and both parents and programs are committed to the use of data-based decision making is an essential part of a good program match. In fact, a good match will be evident to the extent that the data show progress.

In quality programs, teaching begins with assessing the child's skills and problem behaviors. Then, teaching programs are selected to build on existing skills. Specific skill development curricula and assessment instruments are available to support the comprehensive process of identifying instructional targets and planning for ongoing skill development. Parents should inquire about the materials used in a school, and schools should provide a rationale supported in the research literature for the use of specific assessment instruments and practices.

Above and beyond the specific materials that inform the selection and evaluation of goals and objectives, it is important to understand how particular strategies will be used to create a guide for ongoing skill development. It is not sufficient for a teacher to know what skill comes next in a sequence, but to understand how a particular skill or goal fits into a broader conceptual or skill development picture, and lays the foundation for functional skills and activities relevant to each student's life. The teacher must become her own classroom scientist, doing exploratory studies with a child to identify the best strategy for teaching specific skills for the individual child. When a child fails to make progress with one strategy there are others to try and the most effective interventions are the ones that should become first choice for introducing new but related tasks.

Many of the specific strategies within ABA and even across other models of intervention have been integrated into comprehensive treatment models or intervention "packages" built upon the core foundation strategies and theoretical principles, but focused on or associated with specific values, settings, curricula or skill domains (Odom et al. 2010). For parents and schools, understanding the commonalities and differences among these models or treatment packages will help develop a constructive dialogue to determine the elements which are a best fit for a particular child. There is currently no algorithm allowing us to make such matches and treatment planning must be based on assessment, intervention and continual monitoring of progress.

Summary

Despite all that is known about the needs of children on the autism spectrum and strategies to meet those needs, there

remains a significant gap in applying this knowledge (Dingfelder and Mandell 2011). In reality, most educational settings are not equipped with the level of expertise, resources and flexibility to offer appropriately matched and responsive services to every child on the spectrum. Given this current limitation, matching individual interventions at the child level within a classroom may meet the intent of matching a child to a treatment. However, the expectation that this can be done on a broader classroom level is still a challenge in most educational settings.

The uniqueness of individuals along the autism spectrum means that one size does not fit all. A classroom or program that meets a student's needs at a specific time, that considers the family situation and context, and sets the stage to respond to these changing needs will be the most productive match between student and program. An appropriate match will be evidenced by data and result in outcomes producing meaningful change and apparent social validity. One needs to consider variables at all level to increase the chances that the collaboration between families and professionals will be productive and that each student with ASD will receive meaningful and effective services based on empirical support and informed by the available evidence.

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