

Focus on Autism and Other Developmental Disabilities

<http://foa.sagepub.com>

Choosing Objectives for a Distance Learning Behavioral Intervention in Autism Curriculum

Beth Sulzer-Azaroff, Richard Fleming, Megan Tupa, Robert Bass and Charles Hamad

Focus Autism Other Dev Disabl 2008; 23; 29

DOI: 10.1177/1088357607311442

The online version of this article can be found at:
<http://foa.sagepub.com/cgi/content/abstract/23/1/29>

Published by:

[Hammill Institute on Disabilities](#)



and



<http://www.sagepublications.com>

Additional services and information for *Focus on Autism and Other Developmental Disabilities* can be found at:

Email Alerts: <http://foa.sagepub.com/cgi/alerts>

Subscriptions: <http://foa.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Choosing Objectives for a Distance Learning Behavioral Intervention in Autism Curriculum

Beth Sulzer-Azaroff

University of Massachusetts

Richard Fleming

University of Massachusetts Medical School, Waltham

Megan Tupa

SchoolWorks, Inc., Beverly, Massachusetts

Robert Bass

Charles Hamad

University of Massachusetts Medical School, Waltham

The national need for individuals trained in applied behavior analysis (ABA) helped persuade the U.S. Department of Education to fund the development of a four-course, undergraduate-level curriculum on the topic. In this article, the authors report the results and application of a four-phase *Delphi* survey procedure designed to identify the most critical topics to cover in the curriculum. Thirty-four specialists in behavioral intervention participated and identified 74 items, 36 of which eventually emerged as *strongly recommended*, 27 as *recommended* and 11 as *not recommended*. This information was used to select topics and practices to cover in the courses. Other ABA scholars, researchers, and practitioners may find this information useful in designing instructional programs for adults.

Keywords: *applied behavior analysis; autism spectrum disorders; instruction; personnel preparation*

The alarming rise in the number of individuals diagnosed with autism has placed major demands on medical, behavioral, educational, and family services worldwide. Currently, *early behavioral intervention*, which refers to the systematic application of scientifically validated behavior analytic principles and procedures among young children, is viewed as the developmental “linchpin” in the overall treatment protocol (*Journal of Autism and Developmental Disorders*, 2002; National Research Council, 2001). Two resources are needed to meet the demand for early behavioral intervention: (a) professional and paraprofessional personnel and parents, both knowledgeable and skilled in behavioral interventions, and (b) education and training programs that are effective and sufficiently flexible to enable personnel preparation (McCollum & Hemmeter, 1997).

A few years ago, the U.S. Department of Education, under its *Fund for the Improvement of Post-Secondary Education* (FIPSE), *Learning Anytime Anywhere Partnerships* (LAAP) program, funded the development, evaluation, and dissemination of a four-course applied behavior analysis (ABA) distance learning curriculum,

titled *Behavioral Intervention in Autism* (BIA), to prepare interventionists to address the needs of 3- to 7-year-old children with autism. To meet the needs of a widely dispersed student body, the program was designed to allow students to learn electronically from a distance at times and places convenient to them.

The Eunice Kennedy Shriver Center was chosen based on its specialization in preparing personnel to apply the principles of behavior analysis to individuals with developmental disabilities and its expertise in behavioral instructional methods. The first step in the BIA curriculum-development process was to choose a set of instructional objectives. In the case of personnel preparation, these objectives often are referred to as *competencies*.

The ideal approach for developing competencies would be to isolate each objective and show that when included and supported by effective instruction, the learner would come to function more effectively when working with children; when absent, the learner's performance would be delayed or unaffected. Given the many, practically insurmountable, steps required by that process, waiting for the field to discover all that critical

information for each and every concept and method, within each client category, would take many years. For instance, Neef (1995) suggests that each intervention validated by research would need to be disseminated to individuals, who then would disseminate them to practitioners, who then would apply them in their own settings. Meanwhile, the impact of those applications would need to be assessed among individual students within given populations.

The need to be expedient in designing a comprehensive curriculum containing a large pool of promising objectives within a finite time frame led to consideration of alternatives. One alternative was to select demonstrably successful programmatic features (e.g., Iovannone, Dunlap, Huber, & Kinkaid, 2003; National Research Council, 2001) or behavioral packages, such as “discrete trial training” (Smith, Eikeseth, Klevstrand, & Lovaas, 1997), “incidental teaching” (Fenske, Krantz, & McClannahan, 2001), “pivotal response training” (Koegel & Koegel, 1995), and others. Another alternative was to incorporate as complete a conceptual foundation into the program as possible, hopefully to enable students to recognize, draw on, and integrate experimentally demonstrated behavioral principles and procedures (Sulzer-Azaroff & Mayer, 1992) within the courses. With more than a half century of research in behavior analysis though, the conceptual pool is quite vast.

A third, more efficient interim approach would be to turn to a group of respected specialists in the field for their suggestions. These options were not mutually exclusive, of course, and the authors drew from each, beginning with a survey of a group of such specialists.

It was agreed that the first step in the curriculum-development process would be to decide what to teach; to select the set of behavioral principles, procedures, topics, and personnel skills deemed most crucial for intervening effectively with children with autism; and to avoid including those deemed less relevant or unimportant. Because the full compliment of behavior analytic concepts and methods is so vast, the *Delphi Method* was used to determine those key elements. Originally developed as a means for determining future needs in the aircraft industry, the *Delphi Method* has been used as a tool in technology, education, and numerous other fields (Cornish, 1977). This method is a structured process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback (Adler & Ziglio, 1996). The *Delphi Method* allows a panel of experts to arrive at a consensus in several phases and is characterized by respondent anonymity, controlled feedback, and statistically interpretable group responses. The

system is deemed to be especially useful when full scientific knowledge is lacking (as it was in the present case) and when decision makers are uncomfortable about depending on their own intuition or on the opinions of a very small set of experts. This method has been used in the ABA field to define “behavior modifiers” working at different levels within the field of developmental disabilities (Sulzer-Azaroff, Thaw, & Thomas, 1975) as well as to query psychology doctoral candidates enrolled in a training program specializing in developmental disabilities (Zane, Sulzer-Azaroff, Handen, & Fox, 1982), behavioral safety personnel (Lischeid, Sulzer-Azaroff, & Alavosius, 1997), and behavior analytic practitioners in general (Shook, Hartsfield, & Hemingway, 1995).

The *Delphi Method* readily lent itself to the challenge of selecting the knowledge and skill objectives crucial for competent practitioners of ABA in the autism area. In a series of phases, a sample of knowledgeable, skilled people in the field were asked which concepts and skills of the vast potential pool to teach (or not teach) to teachers and parents in order to isolate the key objectives to teach instructional personnel and parents the most crucial aspects of applied behavior analysis using the Internet. Those phases included the following:

Phase 1: assembling a pool of specialists and highly invested potential consumers of information and education in autism and related conditions willing to assist in compiling the list;

Phase 2: asking respondents to propose a few essential instructional objectives (i.e., competencies) along with one or more they judged not to belong in the curriculum;

Phase 3: rating the list and adding new items; and

Phase 4: rating the list of new items.

Method

Participants

The study was conducted by the authors, a team of scientists, and curriculum designers affiliated with the Eunice Kennedy Shriver Center and the University of Massachusetts Medical School. Participants who responded to the *Delphi* survey primarily consisted of people nominated by their peers as highly regarded ABA scholars, professionals, and practitioners specializing in early intervention in autism. Table 1 lists participants, their educational attainments, whether they are Board Certified Behavior Analysts (BCBAs), their position titles and minimal years of experience in the field, and the phases of the survey they completed. A few (2, 8, 28, 33, 35) were technical specialists with expertise in evaluation

Table 1
Participant Characteristics

Code #	Degree	BCBA?	Position	Years Experienced	Phase(s) Participated			
					1	2	3	4
1	PhD	Yes	Director, ASD practicum training	—	X		X	
2	PhD	No	University faculty, consultant (ASD, personnel preparation)	10+	X			
3	PhD	—	Professor of psychology	35+	X			X
4	MA	—	ASD consultant	—	X			X
5	PhD	No	President, ASD consulting organization	13+	X		X	X
6	MA	Yes	Program supervisor	3+	X		X	
7	PhD	Yes	Case manager	15+	X		X	X
8	EdD, RN	No	Internet nurse educator	16	X			
9	PhD	Yes	Educator/behavior analyst, managing partner, consultant lead trainer	14	X		X	
10	MS	No	President, educator, ASD consulting organization	10+	X			X
11	PhD	—	Professor ABA	—	X			X
12	PhD	No	Executive director ASD program	25+	X		X	X
13	PhD	No	Professor special education	15+	X		X	X
14	MS	Yes	ASD consultant	19	X		X	X
15	PhD	Yes	Executive director AAUAP	—	X			X
16	PhD	Yes	Director ASD treatment program	13+	X		X	X
17	PhD	Yes	Professor, program operation specialist	15+	X			X
18	PhD	No	Foundation director, special school, senior scientist	25+	X		X	
19	PhD	No	Executive director AAUAP	20+	X			
20	MA	Yes	Educational consultant	13	X		X	X
21	PhD	No	Executive director Child Development Institute	25+	X			
22	PhD	Yes	ASD program director	15+	X			
23	PhD	No	Executive director Child Development Institute	25+	X			
24	PhD	No	Resident director, developmental disabilities residential center	—	X			X
25	PhD	No	Professor, education	25+	X		X	
26	PhD	Yes	Staff developer, elementary school	11+	X			
27	PhD	No	Assistant professor, early childhood special education	5+	X	X	X	
28	PhD	No	Resident assistant professor, director university distance learning program	9+	X			
29	PhD	No	Director, university-affiliated center for persons with disabilities	15+	X		X	
30	PhD	No	Professor of psychology	10+	X	X	X	X
31	PhD	Yes	Associate professor, manager university-affiliated ASD program	—	X		X	
32	PhD	No	Associate professor	14	X			
33	MS	No	Director graduate certificate program nursing and health	16	X			
34	MA	Yes	Director ASD education program, director research and development	10+	X		X	X
35	PhD	No	Project evaluator, private evaluation organization	—	X			

Note: BCBA = Board Certified Behavior Analyst; ASD = autism spectrum disorders; ABA = applied behavior analysis; AAUAP = American Association of University Affiliated Programs.

and/or distance instruction and who had working histories with people in this area. To obtain this cohort, members of the advisory board of the federally funded project were contacted, along with a number of other respected colleagues, including members of the Autism Special Interest Group affiliated with the Association for Behavior Analysis as well as a nonprofit organization, the Cambridge Center for Behavioral Studies (CCBS) that is dedicated to informing the public about effective and humane applications of principles of behavior.

These individuals were asked if they would be willing to participate in the project and, if so, to provide some demographic information. These individuals also were asked if they would suggest the names of other experts in the field to contact. The latter group then received the same solicitations and they, in turn, also supplied names of other individuals. Thirty-five participants responded to one or more of the four phases. Fourteen were employed as university faculty, 19 as professional specialists in behavior analytic research-based educational programs serving students with autism, two experienced practitioners also were completing (and subsequently have completed) their doctoral dissertations in the field, two were executive directors of national organizations serving this population, one was a full-time researcher in the field, and two were members of the BIA advisory board (i.e., evaluation and distance learning experts) but were not autism specialists. As appropriate, participants who did not consider themselves specialists in early intervention in autism did not participate beyond the first phase of the study, although several did offer the names of other specialists and suggested additional resources.

To be certain that parental viewpoints were considered, a mother of a child on the spectrum, known to the first author, volunteered to assemble a group of parents of other children with autism spectrum disorders (ASD). Three couples and two individual parents attended a meeting between Phases 3 and 4. Other than informally, parents did not supply many details about themselves or the specific ages and functioning levels of their children, although it was clear that all of their children were receiving local educational services. All were articulate and seemed highly motivated to do whatever they could to enhance the quality of such educational services.

Delphi Procedures

Simple, short cover messages and questionnaires, intended to take respondents no more than 5 to 10 minutes to complete, were either faxed or sent to participants by e-mail.

Phase 1. The cover message explained the purpose of the project: (a) the need to develop a distance learning training program for teachers and parents of students with autism and related disabilities and (b) a request for their help in developing the best possible state-of-the-art distance learning program for teaching professionals, paraprofessionals, and parents about applying behavior analysis among students with autism (and related disabilities).

Participants were assured that their responses would consume no more than 10 minutes and were asked to supply information about themselves, including their backgrounds, their interest in the project, and their current professional roles. They also were asked to suggest other specialists in the field who they believed would be willing to contribute to the effort. Thirty-five respondents completed the forms.

Phase 2. A new form, distributed a month later, simply requested that they write down a list of the following:

- three or more absolutely essential aspects of behavioral intervention in autism that the learners taking the course should be able to know and/or do after completing the sequence,
- one or more important objective others might easily overlook, and
- one or more objectives that did *not* belong in the curriculum.

Only two people responded, suggesting a total of seven objectives. Adhering to the behavior analytic dictum that “the subject is always right” (i.e., their reticence to comply was assumed to reflect that the requested task was too daunting), a new step was interposed. The authors (senior researchers and textbook authors in the field) drew up a list of many of the key concepts and skills covered in contemporary behavior analytic research, scholarly writings, and educational training texts. This item pool was presented in Phase 3.

Phase 3. The combined pool of topics constituted a total of 52 items. These items were listed on a form and faxed, e-mailed, or mailed to all participants. On the form, the respondents were asked to (a) rate each of the items by assigning two checks for those topics they considered *absolutely essential* and one check for those topics they deemed important *but not essential*, (b) cross out any items they felt did not belong in the curriculum at all, (c) add any items they felt were missing from the list, and (d) write down their suggestions for important audiovisual resources, useful textbooks, and articles. Seventeen people responded, for a response rate of 49%.

Parent meetings. While Phase 3 was in process, an informal meeting was held with eight parents of children with

autism. The parents were asked to discuss specific skills and information that they felt they needed to learn to be able to better teach their children. Their suggestions were recorded, verified via e-mailed minutes, and added to the fourth list of items. This process ensured the documentation of parental perspectives along with those of professionals.

Phase 4. Shortly afterward, the list of the 24 new items respondents had added to the list during Phase 3, along with those that had been suggested by parents, were distributed. Participants were requested to rate the new items as they had rated the previous items. Sixteen responded (46%). Mean ratings were calculated for each item by assigning weights to those marked by respondents with two checks as 2, with one check as 1, with no checks as 0, and if crossed out as -1.

Results

The total pool of 74 items is displayed in Table 2. Thirty-six of these constituted the group of *strongly recommended* items according to a cutoff point designated jointly by the authors with a rating of ≥ 1.5 . The most highly rated items span an array of response categories, including *ABA principles* and concepts (e.g., reinforcement, extinction, punishment), *ABA procedures* (e.g., prompting methods, shaping, differential reinforcement), *instructional design skills* (e.g., task analysis, organizing instruction), *ABA programs* (e.g., incidental teaching, discrete trial training), *general professional skills* (e.g., working/collaborating with families, legal and ethical considerations), and *child skill selection* (e.g., self-help skills, play/social skills).

In addition, a shorter list of items, displayed in the second column, was *recommended*, but with lesser levels of enthusiasm, as indicated by ratings between 1.05 and 1.47. Those in column 3 fell into the category of *not recommended*.

Discussion

This *Delphi* investigation was the initial step in an arduous and ongoing process of attempting to identify what information and skills teachers and parents of children with ASD need to have mastered to be able to intervene effectively with those children. The results reported here represent each *Delphi* respondent's best judgment. They do not necessarily represent the views of all professionals or parents concerned with autism education, although they appear to mirror many of the general recommendations made in other reviews of the literature on early behavioral intervention with children with ASD (e.g., National Research Council, 2001,

Schreibman, 2000). Again, curriculum development in the BIA program is a continuing process, with revisions to content and objectives implemented based on the most current scientific research.

That 35 specialists in the field took the time to participate at some level was most heartening. The authors felt confident that the input was broad-based and thoughtful. Parents, directors of leading autism advocacy organizations, federal agencies, ABA educational programs, researchers, behavioral educators, and personnel trainers from major universities were all represented. Participants resided in various geographical areas of the nation, spanning all time zones within the contiguous United States.

Although the authors tried to be sensitive to the time demands on this pool of participants by keeping requests minimal, it appeared that the bounds were overstepped during the second phase when participants were asked to formulate several complete objectives. In fact, one respondent phoned with the observation that the request was too burdensome.

At that point, to prepare for Phase 3, the authors contributed suggestions, based on previous work (Sulzer-Azaroff et al., 1975; Zane et al., 1982), and combined them with those that had been received. Perhaps this step biased the item pool, although respondents could and did offer a range of ratings. The revised format was more successful in encouraging people to respond and offer suggestions. In fact, during Phase 3, respondents added quite a few items to the pool, filling in some apparently important gaps in the list. As one example, "chaining" (or "sequential tasks"), an important behavior analytic procedure, inadvertently had been missing from the initial list. That item, along with 23 others, was added to the item pool.

The results of this survey have proven their value by helping to guide development of the BIA curriculum. The authors were able to cross-check materials under consideration against the lists of *strongly recommended* and *recommended* items and to locate or develop *de nova* missing resources (e.g., a package of laboratory and field experiences; Sulzer-Azaroff, 2007).

Specifying topics for coverage in courses was just the beginning. Next, the authors needed to decide how students should be able to make use of those items for purposes of educating their own students or children with autism. Should BIA students just be familiar with a concept at a simple verbal behavioral level (i.e., be able to identify something as a correct example: "*Harry can use vending machines of different configurations to purchase a can of juice. Is this a case of generalization?*") or should they be able to differentiate it from others (say, when an example does and does not match the definition: "*Harry can*

Table 2
Mean Ratings of Items

Strongly Recommended	<i>M</i>	Recommended	<i>M</i>	Not Recommended	<i>M</i>
Promoting generalization	2.11	Demonstrating functional relations	1.47	Time management	0.89
Supporting maintenance	1.95	Managing instruction	1.47	Historical aspects of ABA	0.89
Reinforcement	1.95	Definitions and characteristics	1.47	Motor skills	0.84
Motivational variables (establishing operations)	1.94	Picture exchange communication system	1.44	Medical issues in autism	0.79
Incidental teaching	1.94	Selecting mastery criteria	1.44	Sensory/motor handicap	0.68
Shaping	1.89	Designing educational plans	1.42	Stress management	0.62
Working with families	1.88	Scientific underpinnings	1.42	Drug state	0.63
Differential reinforcement	1.84	Child development	1.38	Verbal behavior: Partington model	0.50
Prompting methods	1.84	Fluency training	1.38	Illness	0.31
Correcting errors	1.84	Working with caretakers	1.38	Obtaining funding	0.21
Task analysis	1.83	Communication: Picture assisted	1.32	Quick autism cure methods	0.00
Defining behavior	1.82	Ecobehavioral assessment	1.29		
Recording behavior	1.82	Collaboration with other professionals	1.25		
Establishing and strengthening behavior	1.79	Cognitive skills	1.21		
Behavioral measurement	1.76	Higher order conditioning	1.16		
Discrete trial teaching	1.76	Designing curricula	1.16		
Extinction	1.74	Communication: Sign	1.16		
Decreasing behavior	1.74	Writing assessment reports	1.13		
Play, other social skills	1.74	Self-control	1.13		
Choosing appropriate behavioral measures	1.73	Working with schools	1.11		
Self-help skills	1.68	Learning-readiness skills	1.11		
Selecting target behaviors and goals	1.68	Self-preservation methods	1.11		
Functional analyses of maladaptive behavior	1.68	Prerequisite analysis	1.06		
Displaying and interpreting data	1.68	Assessment of cumulative mastery	1.06		
Assessing instruction	1.63	Communication: Oral only	1.05		
Simple operant conditioning	1.63	Communication: Adaptive tech.	1.05		
Sequential tasks	1.58	Simple classical conditioning	1.05		
Organizing instruction	1.58				
Legal and ethical considerations	1.58				
Punishment	1.58				
Common characteristics of students with autism	1.58				
Verbal behavior	1.56				
Descriptive analysis	1.53				
Working with staff	1.50				
Selecting verbal operants to develop	1.50				
Setting conditions	1.50				

Note: ABA = applied behavior analysis.

operate the vending machines at school and outside of the supermarket but not the one at the movie theater. Has he learned sufficiently to generalize his skill?)? Is it important to use concepts to analyze more complicated problems (*“Harry can get juice from any vending machine. Can he now apply those ‘machine’ skills to learn to use the automated bank teller?”*)? Is knowing (being able to define, discriminate, use in higher order verbal learning, etc.) sufficient or do BIA students need to be able to use their

knowledge to solve problems (e.g., how to design a curriculum to teach the use of the automated bank teller)? Furthermore, do students need to be taught how to perform a skill correctly (e.g., actually teach one of their students to use the automatic bank teller)?

To an extent, the analyses of topical *classes* provided information about the level of sophistication an objective should represent, and thus the level of knowledge and skill students must achieve to be effective interventionists.

Although attempts have been made to teach all of the *strongly recommended* and most of the *recommended* items at the simple verbal/conceptual level, the curriculum moved into the *application* level for those items on the list deemed to be practitioner skills. For instance, promoting generalization, one of the heavily endorsed items, was designed to be taught as both a concept and a skill. Students are learning to define what stimulus (and also response) generalization is and is not. They also are asked to choose examples of generalization from an array; generate examples of their own; use the concept in analyzing teaching plans of others (as in Course 3: *Program Models in Behavioral Intervention in Autism*); and design and carry out, actually or in simulation, teaching plans of their own (as in Course 4: *Practicum in Behavioral Intervention in Autism*).

Students are informed about ABA perspectives on punishment so they know how difficult it is to use it properly and ethically, along with its other downsides. However, students are not taught to actually apply punishment because preferable positive alternatives exist in most cases and because applying punishment ethically and effectively requires more in-depth sophistication and qualified expert supervision than was available at this undergraduate level. It would not be feasible to guarantee such supervision in a distance course organized as is the present one. As an alternative, though, students were instructed via simulation about how to functionally assess maladaptive behavior and to select and apply positive strategies to promote constructive alternative behaviors.

In the process of elaborating the list of topics into instructional objectives of the type detailed by Mager (1962) and his successors (including the verbal, motor, and other classes of *behavior* to be performed, the *conditions* under which they should and should not be performed, and the type and level of *standards* to be achieved), the list of topics has been cross-checked against others' inventories. Subsequent to the current investigation, one such list published by the Behavior Analysis Certification Board—the *BCBA and BCABA Behavior Analysis Task List*—is currently in its third edition (www.bacb.com). The competencies addressed in the *Task List* are in the areas of Ethical Considerations; Definitions and Characteristics; Principles, Processes, and Concepts; Behavioral Assessment; Experimental Evaluation of Interventions; Measurement of Behavior; Displaying and Interpreting Behavioral Data; Selecting Intervention Outcomes and Strategies; Behavior Change Procedures; and Systems Support. Of interest, although not surprisingly, the results of this *Delphi* assessment and related BIA curriculum closely reflect the competency items now listed in that BACB task list. This, in a sense, provides further validity for the content identified

as important in the *Delphi* process and later incorporated into the BIA curriculum.

Limitations

It must be remembered that respondents' ratings are subjective and could be influenced by various factors: their learning histories, the nature of their current activities, and anticipated future demands. For instance, under the *Items Not Endorsed* list was verbal behavior: Partington model. Written comments and informal conversation with several participants suggested either that they were unfamiliar with that model or that they felt verbal behavior already was incorporated within other topics. Similarly, perhaps it was a lack of familiarity with Precision Teaching and relaxation techniques for children with autism that resulted in those items receiving weaker ratings.

Because the cohort of responders was selected and not chosen at random, the resulting competencies could reflect a thread of common histories and values. Although every effort was made to identify as broad a range of behavior-analytic expert participants as feasible, certainly the group was heavily weighted toward the experimental side. Probably that was due to the authors' familiarity with the more productive researchers, who present regularly at conferences and whose names have appeared repeatedly in the ABA literature. Possibly, as well, the authors may have turned more toward that faction of the ABA-in-autism community that reflected personal biases toward positive and constructive methods in contrast with those involving application of more punitive ones.

By contrast, variability among respondents could depend, as mentioned above, on the nature and levels of their familiarity with the current research and experimental literature in the field. That, in turn, could influence their designations of which concepts and skills they considered valuable. Undoubtedly, though, many of their choices probably were subjective and perhaps not thoroughly substantiated.

The ultimate test would be the influence that the BIA students' mastery of objectives has on the rate and precision of their own students' learning. An example might be to show that mastering incidental teaching skills relates functionally to that individual's own students' increased rates of communicating. Experimentally analyzing the function of each objective for individuals on the autism spectrum in this way would be too daunting a task for an enterprise of the present scope. Identifying the most powerful instructional arrangements at both micro- and macrolevels will take many years. In the interim, turning to expert experimentalists, scholars, and practitioners in the field seemed a reasonable approach.

The resultant sequence of competences has been pilot tested with small groups of volunteer students, and their

progress rates and satisfaction with the curriculum have been surveyed. Measures of both BIA student learning and satisfaction, reported elsewhere in detail (Fleming & Sulzer-Azaroff, 2002, 2005), have been highly promising.

Conclusion

Competence in the knowledge and skills of applied behavior analysis has been identified as crucial for effectively teaching students with autism. With its dozens of scientific journals; multitude of local, regional, national, and international organizations; and extensive inventory of textbooks and other instructional resources, ABA has shown itself to be a vast field. Skillful performance as a practitioner within the discipline covers a huge array of potential instructional objectives. If the goal of providing Internet-based instruction (emphasizing behavioral intervention in autism) within four undergraduate-level courses were to be met, these items needed to be chosen with extreme care. This *Delphi* survey, representing the initial step in the distance training curriculum process, brought together the combined expertise of scholars, researchers, curriculum, and program administrators and developers. The findings have been used as a tool to fine-tune the curriculum. Other ABA scholars, educators, and trainers may, similarly, find these results valuable when they design their own programs. The ultimate test, however, is to evaluate its impact on individual students with autism, the critical consumers.

References

- Adler, M., & Ziglio, E. (1996). *Gazing into the oracle*. Bristol, PA: Jessica Kingsley.
- Cornish, E. (1977). *The study of the future*. Washington, DC: World Future Society.
- Fenske, E. C., Krantz, P. J., & McClannahan, L. E. (2001). Incidental teaching: A not-discrete-trial teaching procedure. In C. Maurice, G. Greene, & R. M. Foxx (Eds.), *Making a difference* (pp. 75-82). Austin, TX: PRO-ED.
- Fleming, R. K., & Sulzer-Azaroff, B. (2002, May). *eABA: Designing a PSI-type curriculum in autism education*. Paper presented at the 28th annual convention of the Association for Behavior Analysis International, Toronto, Ontario, Canada.
- Fleming, R. K., & Sulzer-Azaroff, B. (2005, January). *Weaving the essential tapestry: OBM research to practice in training autism personnel on line*. Paper presented at the 10th Organizational Behavior Management Conference, Sarasota, Florida.
- Iovannone, R., Dunlap, G., Huber, H., & Kinkaid, D. (2003). Effective educational practices for students with autism spectrum disorders. *Focus on Autism and other Developmental Disabilities*, 18, 150-165.
- Journal of Autism and Developmental Disorders*. (2002). 32(4) [Special issue].
- Koegel, R. L., & Koegel, L. K. (1995). *Teaching children with autism*. Baltimore: Paul H. Brookes.
- Lischeid, W. E., Sulzer-Azaroff, B., & Alavosius, M. (1997, October). Behavioral safety: Who will train the safety profession? *Professional Safety*, pp. 32-36.
- Mager, R. F. (1962). *Preparing instructional objectives*. Palo Alto, CA: Fearon.
- McCullum, J. A., & Hemmeter, M. L. (1997). Parent-child interaction intervention: When children have disabilities. In M. Guralnick (Ed.), *The effectiveness of early intervention*. Baltimore: Paul H. Brookes.
- National Research Council. (2001). *Educating children with autism*. Washington, DC: National Academy Press, Committee on Educational Interventions for Children with Autism, Division of Behavioral and Social Sciences and Education.
- Neef, N. A. (1995). Research on training trainers in program implementation: An introduction and future directions. *Journal of Applied Behavior Analysis*, 28, 297-299.
- Schreibman, L. (2000). Intensive behavioural/psychoeducational treatments for autism: Research needs and future directions. *Journal of Autism and Developmental Disorders*, 30(5), 373-378.
- Shook, G. L., Hartsfield, F., & Hemingway, M. (1995). Essential content for training behavior analysis practitioners. *Behavior Analyst*, 18, 83-91.
- Smith, T., Eikeseth, S., Klevstrand, M., & Lovaas, O. I. (1997). Intensive behavioral treatment for preschoolers with severe mental retardation and pervasive developmental disorder. *American Journal on Mental Retardation*, 102, 238-249.
- Sulzer-Azaroff, B. (2007). *Applying behavior analysis across the autism spectrum: A field guide for practitioners*. Cornwall on Hudson, NY: Sloane.
- Sulzer-Azaroff, B., & Mayer, B. (1992). *Behavior analysis for lasting change*. Fort Worth, TX: Harcourt Brace.
- Sulzer-Azaroff, B., Thaw, J., & Thomas, C. (1975). Behavioral competencies for the evaluation of behavior modifiers. In W. S. Wood (Ed.), *Issues in evaluating behavior modification* (pp. 47-98). Champaign, IL: Research Press.
- Zane, T., Sulzer-Azaroff, B., Handen, B. L., & Fox, C. J. (1982). Validation of a competency-based training program in developmental disabilities. *Journal of the Association for Persons With Severe Handicaps*, 8, 21-31.

Beth Sulzer-Azaroff, professor emeritus, University of Massachusetts, is an active researcher, distance educator, curriculum developer, writer, and consultant in the field of applied behavior analysis. Her current interests are in the areas of leadership, personnel preparation, and quality assurance in organizations serving people with special needs. She can be contacted at 5555 Heron Pt. Dr., Unit 1102, Naples, FL 34108; e-mail: bazaroff@comcast.net

Richard Fleming is assistant professor of psychiatry at the E. K. Shriver Center, University of Massachusetts Medical School, Waltham.

Megan Tupa is project manager for school quality reviews at SchoolWorks, Inc.

Robert Bass is associate clinical professor of psychiatry at the E. K. Shriver Center, University of Massachusetts Medical School, Waltham.

Charles Hamad is an associate professor in pediatrics at the E. K. Shriver Center, University of Massachusetts Medical School, Waltham.