Theory and Theory-driven Practices of Activity Based Intervention

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Abstract

Activity Based Intervention (ABI) is an approach used in many early childhood programs serving the special needs of young children and their families. The purpose of this article is to present theoretical underpinnings of ABI, and discusses theory-based ABI practices. ABI draws upon multiple and varied theories which in turn inform practice. At present, there is not a universal theory that can explain the complexities of how young children develop and learn. This article presents a theoretical model for ABI programs, and then describes theory-driven ABI practices, which include quality professional development opportunities, links to an effective measurement system, and a strong family focused component.

Keywords*:* Activity Based Intervention, theory, early intervention, and early childhood special education

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There is nothing so practical as a good theory. ~Kurt Lewin (1951)

Activity Based Intervention (ABI) is an approach used in early childhood programs to address the special needs of young children and their families. Bricker and others have described ABI as a child-directed and naturalistic teaching strategy occurring in a context that is typical for young children, like their homes and community settings such as a preschool classroom (Bricker & Woods Cripe, 1992; Bricker with Pretti-Frontczak, & McComas, 1998; Pretti- Frontczak & Bricker, 2004). ABI addresses the developmental and educational goals of young children by encouraging child participation in meaningful daily activities using behavioral learning principles. Four elements of ABI are:

- development of goals for children that are functional and can be generalized across settings, events, people, and time;
- implementation of activities to address goals that are child-directed, routine, and planned;
- child experiences consequences and timely feedback that are integral to the intervention; and
- child experiences a variety of learning opportunities to address their goals.

The practice of ABI is based on a theoretical framework that has been evolving since the 1970s. In order to apply ABI effectively, it is necessary to have an understanding of the underlying theory that has influenced practice. Core concepts are grounded in theory. Leonardo DaVinci is reported to have said, *He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast.* Similar to DaVinci's sailor, Interventionists need a theoretical base to guide quality practice. The purpose of this paper is to highlight the theoretical foundation of ABI, and then describe examples of theory-driven ABI practice.

Theoretical Perspectives

What is a theory? Sroufe, Cooper, and DeHart (1992) define theory as, "an organized set of proposals about how things operate. It is an attempt to summarize current observations in light of past observations and to predict future ones" (p. 14). Theory is NOT a list of references, data, opinion, list of variables or constructs, diagrams, or hypotheses (Sutton & Staw, 1995). It is often difficult to reach consensus on what constitutes a theoretical contribution (DiMaggio, 1995; Whetten, 1989). Berk (1999) points out that a theory must be testable, and offer a structure for cataloging our observations. She further explains, "Theories that are verified by research often serve as a sound basis for practical action. Once a theory helps us understand development, we are in a much better position to know what to do in our efforts to improve the welfare and treatment of children" (Berk, 1999, p. 5).

Currently, neither the fields of education nor psychology have a global theory that is capable of addressing all aspects of human behavior. Existing theories tend to focus on different aspects of child development and learning (e.g., social and cognitive). Therefore it is necessary to draw from multiple theories to assist in explaining the complexity of human behavior. One theory alone cannot explain all the mysteries and phenomena associated with the human condition. ABI has eight theoretical perspectives (Bricker & Woods Cripe, 1992; Bricker et al., 1998; Pretti- Frontczak & Bricker, 2004), which include: (a) cognitive, (b) developmental, (c) ecological, (d) learning, (e) situated cognitive learning, (f) social learning, (g) sociohistorical, and (h) transactional. What follows is a brief explanation of each theory and how the theoretical perspective applies to ABI.

Cognitive

The research and writings of the Swiss theorist Jean Piaget have influenced the ABI approach. His background in biology, and observations of his own children, lead way to his understanding of how human beings develop across the life span. Piaget's cognitive theory posits that children will actively explore their environment to develop and construct knowledge (Piaget, 1970). Through varied experiences and feedback from the environment, learners will move from one stage of cognitive development into another. Piaget's stages of cognitive development are: *sensorimotor* (e.g., babies use sensory behavior for exploration and learning), *preoperational* (e.g., preschoolers use symbolic but illogical thinking), *concrete operational* (e.g., school age children use reasoning), and *formal operational* (e.g., adolescents and adults use abstract reasoning) (Piaget, 1932, 1952, 1967, 1970).

Cognitive theory has at least three implications for ABI practices. First, the environment is an important consideration and tool in facilitating learning in ABI programs. Interventionists will purposefully design the space, time, materials, activities, and toys that are motivating to learners. Second, young children are active participants in ABI programs. Third, the concept of following the child's lead is the cornerstone of all intervention efforts. By attending to children's cues and motivations, meaningful goals can be embedded into naturally occurring activities.

Developmental

A developmental theory can help describe a range of human functioning from typical to atypical development. Further, it can assist in understanding conditions of risk, adaptation and

maladaptation, and disability patterns from birth to adulthood (Cicchetti & Cohen, 1995; Ollendick, Grills, & King, 2001; Rutter & Garmezy, 1983; Sroufe & Rutter, 1984). Cicchetti and Cohen (1995) propose, "Development occurs as a progression of qualitative reorganizations within and among the biological, social, emotional, cognitive, representational, and linguistic systems proceeding through differentiation and subsequent hierarchical integration and organization" (p. 6). As new levels of organization interface with previous structures, growth occurs within and across systems (Cicchetti & Cohen, 1995; Ollendick et al., 2001).

Developmental theory has implications for ABI practices in a couple of ways. First, the targeted intervention should be comprehensive and cover multiple developmental domains. Intervention that takes place in a one-dimensional and isolated manner would not account for the qualitative reorganizations that happen across, as well as within, systems. Second, in order to detect fine- grain growth and development, a system of assessment/evaluation should be in place to monitor changes that will in turn be used for decision making (e.g., continue with intervention, adjust frequency of intervention, etc.). Therefore, there is a significant need for precise, continuous, and in-depth assessment to inform decisions about intervention.

Ecological

Urie Bronfenbrenner (1979) proposed a theory of early childhood development that depicts child outcomes as a result of convergence between multiple environmental factors. The ecological systems theory is concerned with the broad social environment and context (Bronfenbrenner, 1977, 1986; Bronfenbrenner & Ceci, 1994).

The ecological system's theory places the child at the center with concentric circles emanating outward. The *microsystem* is the immediate setting surrounding the child. For example, a child's family and home is a microsystem. The *mesosystem* is the interactions between two or more microsystems. A child's visit to the doctor's office is an example of the mesosystem interacting with other components of the ecological system. The child is influenced by the interaction with the health care provider(s) and health care system, however, the visit to the doctor's office and the interaction may not immediately impact the child on an ongoing basis. The *exosystem* does not usually include the child in an active role. A parent's employment is an example of how an external system indirectly influences a child. Other examples that may fit into the exosystem are local government, school board, and church. The *macrosystem* considers the general societal context for the family. The social connections of both the exosystem and macrosystem indirectly influence the child's development, but the child does not play a direct role. Macrosystem examples may include culture, economic structure, and government.

The ecological systems theory informs the ABI approach by placing emphasis on the many layers of social context that impact child development. A child does not live in a vacuum, so the microsystem, mesosystem, exosystem, and macrosystem should all be considered when applying ABI. For example, a child's social environment starts with her family members and/or caregivers who will be the immediate contact when designing the child's individualized program and implementing ABI. The family should also be a consideration for ABI practices, when appropriate, to best support the child. Extensions beyond the direct relationships that have an impact on the child's development and ABI practices could possibly include, but are not limited

to: extended family members (e.g., grandparents, cousins, etc.), friends of the family, neighbors, employers, family employment situation, the social community where the child lives (e.g., neighborhood, town, and region), people in leadership positions who create policies that directly and/or indirectly influence the child's life, government, culture, social beliefs and norms, and the world community. The theory is especially useful because it takes into account proximal as well as distal influences that can help with ABI planning, implementation, and in evaluating the effectiveness of ABI across contextual arrangements. For example, an interventionist could monitor the effectiveness of ABI when it is implemented in the child's home, at school, during transitions, and everyday places where the child spends time (e.g., play dates, grocery shopping, church, and park). Bronfenbrenner's ecological systems theory is illustrated in Figure 1.

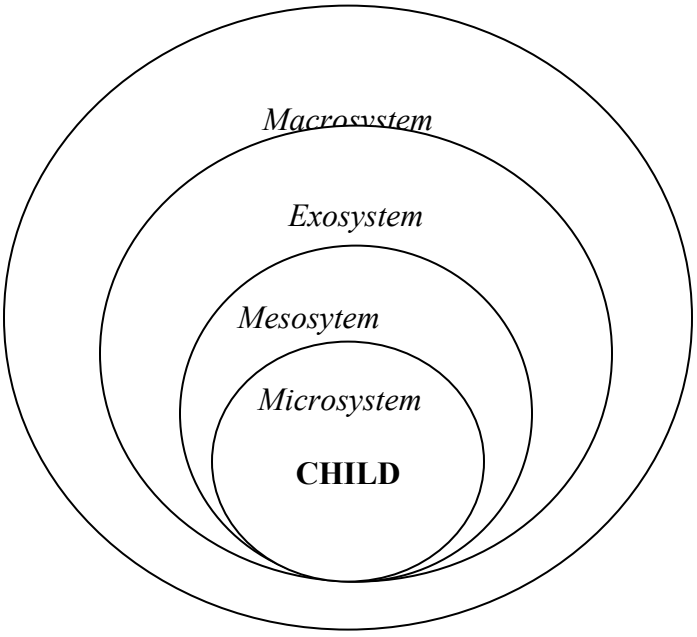


Figure 1. Ecological systems perspective

Learning

The work of John Dewey has influenced ABI by placing emphasis on the types of active learning experiences children encounter. Dewey's theory of learning maintains that learners are best served by having hands-on, active, and *authentic* experiences (Dewey, 1938, 1959). Authentic activities involve creating a simulation or activity that mirrors or closely resembles the real life situations and conditions under which the behaviors/skills are needed. The ABI approach includes activities that are child-initiated, routine-based, and planned so that children have a variety of authentic opportunities to master their developmental and educational goals.

An ABI child-initiated activity occurs when a child shows interest in something (e.g., toy, peer interaction, play) and the interventionist builds on the child's motivation to create a meaningful learning opportunity where the child can practice a targeted skill. An example might

include a child pointing to a utensil during mealtime. The adult could incorporate the child's interest by providing an opportunity for the child to negotiate the utensil to eat something. An ABI planned activity involves the interventionist designing a specific activity in advance that will elicit desired target behaviors from child(ren). If the goal is for the child to learn to eat with a spoon, the adult could plan various activities for the child to practice this skill, like having a tea party with applesauce where the child could use the spoon to serve himself to eat. Routines are established procedures or events that occur on a regular basis. ABI routine activities happen throughout the day and can be good times to embed authentic and embedded learning opportunities for children. Mealtime is an example of a routine activity when children's adaptive, social, and communication goals can be applied in the context of predictable ongoing events.

Situated Cognitive Learning

Situated cognitive learning theory (also called situated learning or situated cognition) builds on Dewey's learning theory by emphasizing the importance of where, when, and how opportunities are available to learners (Brown, Collins, & Duguid, 1989; Greeno, Collins & Resnick, 1996; Putnam & Borko, 2000). The authenticity of experiences and activities created for children occurs through structuring the activity and learning in the environment (Brown et al., 1989). Greeno and colleagues (1996) contend that classroom planning, teaching, and assessment are professional tools needed for situated learning to take place.

According to Putnam and Borko (2000), situated cognitive learning theory has a few fundamental themes. First, cognition is situated in physical and social contexts. *Situated cognition* relies on authentic activities to encourage cognitive development. Second, cognitive development is a social process. *Social cognition* involves interactions with people in the environment as a factor in how cognition develops and what types of skills are learned. Third, cognitive development occurs as a result of interactions across the individual, other persons, and tools, and is often called *distributed cognition*.

Situated cognition theory is a helpful framework for ABI because it underscores the significance of authentic learning opportunities for children. ABI should encapsulate authentic experiences with the physical environment and social climate in mind. Thus ABI will occur in naturalistic setting for an individual including his home, community-based, or combination. Safe and appropriate materials (e.g., toys, equipment, physical furnishings such as child size chairs) will be used in the ABI program to engage the child in meaningful learning experiences. Putnam and Borko assert, "How a person learns a particular set of knowledge and skills, and the situation under which a person learns, become a fundamental part of what is learned" (p. 4). Social atmosphere will need to be considered for appropriate implementation of ABI, because of the powerful influence other people in the environment have on how and what is learned by a child.

Social Learning

Research studies conducted by Pavlov, Skinner, and Watson all influenced what is known as social learning theory, which many consider an outgrowth of behaviorism. Bandura's views on how children learn can be traced directly to their social world. In essence, children will learn information based on environmental factors. Learning occurs through observations and imitation. Social learning theory emphasizes *modeling* as a teaching approach (Bandura, 1977, 1985,

1986). This theory has informed ABI by using logically occurring antecedent, response, and consequence (ARC) units to identify functional and generative skills for children (Bricker & Woods Cripe, 1992). Bricker and Cripes (1992) state

"Activity based intervention is a child directed, transactional approach that embeds intervention on children's individual goals and objectives in routine, planned, or child-initiated activities, and uses logically occurring antecedents and consequences to develop functional and generative skills." (p. 40)

The arrangement of antecedents and reinforcement of desired responses are integral to applying ABI. Timely feedback would include the use of natural, rather than artificial, consequences. If a child has a goal to use words to express wants and needs, the consequence for a correct response would be a logical reply that closely resembles the intention of the behavior. For example, the child asks for an apple. The natural and logical consequence would be granting the child an apple and permission to eat it, rather than a sticker or star on a chart for providing a correct response to a targeted task.

Sociohistorical

Vygotsky's sociohistorical theory (1978) is focused on learning as a social process. Sociohistorical theory was pivotal to viewing knowledge acquisition as a reciprocal interaction between the learner and her or his social environment. The theory relies on children being a part of a larger context than their immediate social environment, as well as children learning from the exchanges that occur between themselves and their social environment. A child's culture and history uniquely shapes development and learning.

ABI takes place in social environments. The concept of Zone of Proximal Development (ZPD) is used when interventionists develop individual program plans for children. ZPD is based on the idea that learners should be presented with learning tasks that are geared to meet their individual needs. Learning opportunities are most appropriate when they are within the learner's suitable zone and neither too challenging nor too easy. For instance, a child with a vocabulary of 20 words might be expected to use those words to express herself along with nonverbal gestures. Eventually adding some more words with increased complexity will be expected. A solid understanding of individual learner characteristics and present levels of development can help interventionists plan learning opportunities accordingly.

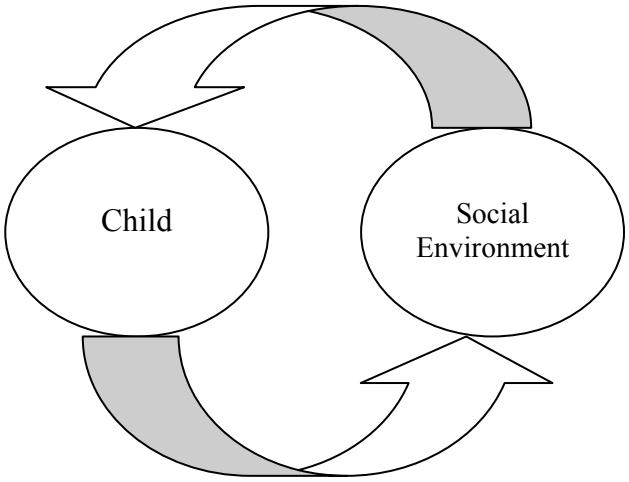
Transactional

Until the mid-1960s, child development literature reflected an understanding that parent and child interactions were unidirectional where the parent/caregiver's behavior had a direct and one-way effect on the growth and development of the child. Bell (1968) was one of the first to introduce a bi-directionality model by proposing a two-way interaction between the parent and child. Bell's bidirectional model described babies as active and competent members in dyadic exchanges with their parent. An extension of Bell's work is Sameroff and Chandler's (1975) transactional perspective that takes into account a complex give and take between innate child capacities and external influences. They argued mutual regulation and adaptation in the child and social environment dyad occurs through shared interactions (Sameroff & Chandler, 1975; Sameroff & Fiese, 2000; Sameroff & MacKenzie, 2003). A change in the social environment

provides an opportunity for the child to reorganize his/her behaviors and vice versa (i.e., the child changes and the social environment or caregiver reorganizes).

A child's development is not based solely on his biology, but in the negotiations between the child and social environment (e.g., parent/caregiver) that have important consequences for a child's development. ABI can be used to promote developmental and educational outcomes for children based on the transactions that occur between the child and the ABI social environment created for learning to occur. Children's development is shaped by the ongoing interactions between people and their environment. Figure 2 depicts Sameroff and Chandler's transactional perspective.

Figure 2. Transactional perspective.



Theory-driven ABI Practice

On a recent visit to an inclusive early childhood community-based program serving a large number of young children with and without disabilities, published informational materials explained the vision, mission, and goals of the program. All written and verbal records explicitly stated the program was based on an ABI approach. The hard working staff seemed to be doing their best to teach all of the children at their site. Unfortunately, however, the interventionists were applying the ABI approach incorrectly because they did not seem to understand the underlying theories that should guide practice. For instance, interventionists primarily used a didactic approach that was highly structured. Children were passive recipients of intervention efforts that focused on discrete and isolated tasks (e.g., moving small, round, blue poker chips from one cup to another). Little or no opportunity was provided for building on children's interests or motivation.

A specific situation occurred during the site visit which illustrates how an ABI approach was mistakenly applied and a lack of understanding regarding theoretical underpinnings. A

toddler with a severe disability, Abigail, became very upset when her mother dropped her off in the morning. Abigail cried and refused to participate in any of the activities. After about a half hour she finally stopped crying when she became interested in a Hello Kitty doll in one of the play areas. Abigail walked over, picked it up, smiled, and displayed the doll for the interventionist to see. Abigail's actions indicated that she was interested in playing with the doll, however she did not yet have the words to explicitly state her desires. The interventionist immediately removed the toy from her and tried to redirect Abigail to one of the workstations to engage her in a structured activity. Becoming even more upset, Abigail cried, kicked a table, and spent a great deal of time that morning in the "time out" corner. The crux of the problem was a vast disconnect between theoretical orientation and actual practice. The staff did not integrate ABI theory with their practices.

Underlying theories of ABI should inform practices, and should be observed across areas of service delivery. Applying the theoretical orientation described earlier would lead to different ABI practices from the ones described for Abigail. Here are some issues that arose with Abigail, along with recommendations for applying ABI, and theoretical considerations:

- Abigail became upset when she arrived at school. An ABI activity schedule would be a helpful tool to use to identify times of the day when events take place, expectations for the child's participation, frequency/duration, and targeted goal/objectives (Bricker & Waddell, 1996; Bricker, Pretti-Frontczak, & McComas, 1998). For example, Abigail may need transitional prompts and more time for adjustment before being expected to jump right into learning activities. Consider the ecology of the classroom and transactions between Abigail and her social environment *(underlying perspectives include the ecological, situated cognitive learning, social learning, sociohistorical and transactional theories)*.

- Abigail became interested and attended to an object in the classroom. This is an example of a child-initiated prompt where the interventionist has an opportunity to elicit target behaviors from the child and practice skills. Similar to a lesson plan, a child-initiated activity plan can be created in an ABI program to address individual learning goals (Bricker & Waddell, 1996; Pretti-Frontczak & Bricker, 2004). Consider following the child's lead to embed learning opportunities by expanding on her curiosity with the Hello Kitty doll (*underlying learning, situated cognitive learning, and social learning theories*).

- Abigail struggled to communicate with others. An ABI individual program plan is a tool that addresses target goals and objectives. Plans include: dates when the plan was initiated and when the target was achieved, team members' names, the goal, description of the goal, criteria, teaching considerations (e.g., antecedents, responses, consequences), evaluation procedures (e.g., who, where, and when), type of evaluation (e.g., narrative summary, portfolio, or behavioral observation), and decision rules (i.e., when intervention may need to be modified) (Bricker & Waddell, 1996; Pretti-Frontczak & Bricker, 2004). Abigail's communication goals could be planned to include specific teaching strategies and evaluation procedures using the individual program plan. Consider modeling and encouraging behaviors from Abigail – such as gestures or signs to express her wants and needs (*underlying*

cognitive, developmental, situated cognitive learning, social learning theories, and sociohistorical).

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These are only a handful of considerations for applying ABI practices that are derived from a theoretical framework. Additional theory-driven ABI practices include: professional development, measurement, and family involvement.

Professional Development

A theoretical framework is at the heart of ABI professional development practices. Activity-Based Interventionists are both in-service and pre-service professionals who are developing, or continuing to develop and refine, strategies for applying ABI. The developmental theory takes into account the qualitative reorganizations that occur as professionals learn new skills, modify practices, and develop proficiency in the application of ABI. The learning and situated cognitive learning theories are useful perspectives when applied to professional development because of the importance placed on creating authentic experiences. Where, when and how ABI practitioners develop skills is important; therefore the context for the professional development activities should closely match the situation where the ABI practices will later be applied. For example, rather than training practitioners to use ABI in a clinical or laboratory setting, it is necessary to provide opportunities in the field (e.g., classrooms and home visits).

Practitioners can learn ABI by observing a master interventionist, read books and articles, watch ABI videos (Bricker, Veltman, & Munkres, 1995; Cripe, 1995), apply the practice with children, and attend professional development activities. Professional development opportunities are available through professional organizations like the Division for Early Childhood (DEC) of the Council for Exceptional Children. Workshops, conferences, and trainings are activities that can be helpful to learn or refine ABI practices. Professional development programs are also offered at colleges and universities.

For example, the Early Intervention Program at the University of Oregon offers intense graduate level training for learning and practicing ABI (Clifford, Macy, Albi, Bricker, & Rahn, 2005; Ryan, Squires, Straugh, Leve, & Potter, 1997; Squires, 1995; Straka, Losardo, & Bricker, 1998). Authentic and experiential learning is integrated into the professional development program; which reflects learning and situated cognitive learning theories. One of the innovative offerings, where master's students develop and apply an ABI inclusive preschool program, is called *Building on Opportunities for Student Teaching and Learning* (BOOST; Macy & Squires, submitted; Squires, Daniels, Allen, & Rahn, 2003; Squires, Macy, & Waddell, 2006;).

Graduate students typically start their master's program in the fall and graduate the following summer for a total of 4 terms. Throughout the year-long program students are immersed in field based experiences, because of the belief that enculturation is enhanced by the ongoing contextual interactions based on both sociohistorical and social learning theories. During their third term, students enroll in a methods course where they develop a preschool program with an ABI approach.

In their fourth and final term, students implement the ABI preschool program by serving young children with/without disabilities from the community and their families. Results from a program evaluation study revealed that BOOST implemented DEC Recommended Practices (Hemmeter, Joseph, Smith, & Sandall, 2001; Sandall, Hemmeter, Smith, & McLean, 2005) to varying degrees, graduate students developed teaming skills needed to effectively practice ABI, families reported high levels of satisfaction, and children showed progress across multiple areas of development (i.e., adaptive, cognitive, motor, social, and social-communication).

Measurement

In order to measure the effectiveness of ABI, the developmental theory offers a useful construct to capture the growth that occurs within and across systems. The United States Department of Education, Office of Special Education Programs (OSEP), state accountability standards, and DEC Recommended Practices (Neisworth & Bagnato, 2005; Sandall et al., 2005) all report the need for reliable and valid measurement systems. It is necessary for ABI programs to include a rigorous measurement system to monitor the effectiveness of interventions. Information derived from the measurement system can aid in the decision making process. Individual and group data can help ABI programs make decisions about duration and frequency of intervention, modifications needed to the intervention, and accommodations for learners.

Activity-based assessment is a type of measurement process often used with an ABI approach (Grisham-Brown, 2000; Kim, 1996; Macy, Bricker, & Squires, 2005; Sher, 2000). Activity-based assessment involves creating an activity or analog circumstance that closely resembles the authentic situations and conditions under which the behaviors/skills are needed. For instance, if we wanted to learn more about how a young child uses a pincer grasp, we could create an activity during a routine mealtime where she needs to use the skill to pick up raisins from her plate. An inauthentic assessment would measure how the child performs this skill under conditions that she would unlikely encounter in her everyday life experiences – such as dropping a small pill size object into a cylinder. Children's performance on activity-based assessment will be collected, monitored, and evaluated across time to measure ABI.

ABI practices can be measured by incorporating a dependable measurement system that can show progress children are making toward learning goals and objectives (Bricker & Woods Cripe, 1992; Bricker, with Pretti-Frontczak, & McComas, 1998; Neisworth & Bagnato, 2004; Pretti-Frontczak & Bricker, 2004). Using an activity-based or curriculum-based assessment with ABI is one way to monitor performance and instructional effectiveness (Macy & Bricker, 2006). There are at least two innovative approaches to measuring the impact of ABI.

The first approach involves using a measurement system to monitor ABI for addressing the social-emotional needs of young children (Squires & Bricker, 2007). A linked ABI approach, which includes an assessment and curriculum, has been developed specifically for the social-emotional developmental domain. Several linked curriculum-based assessment tools are commercially available (Bagnato, Neisworth, & Munson, 1997), however most cover multiple developmental domains (e.g., adaptive, cognitive, fine motor, gross motor, social, and social-communication). The ABI social-emotional tool is in-depth since it specializes in one area of

development. By using ABI to assess and intervene in the social-emotional area, programs have a resource for serving children and their families with these specific needs.

A measurement system that links to a curriculum is helpful to interventionists because it can provide ideas for intervention content. The *Assessment, Evaluation, & Programming System* (AEPS; Bricker, 2002) is a curriculum-based assessment covering multiple developmental areas. It can be used for eligibility determination, ABI programmatic assessments, and ABI curricular content. The AEPS curriculum is activity-based and includes several suggestions and ABI activities that are associated with child goals and objectives that can be derived directly from the AEPS assessment items (Bricker, 2002). The curriculum provides task analysis and intervention strategies for prompting (from least to most intrusive) that include verbal, gestural, modeling, partial and full physical (Bricker & Waddell, 1996).

A second innovation includes an online version of the AEPS which directly links to ABI. In 2006, an electronic web-based measurement system was designed from the AEPS to streamline work for users. Interventionists can input data and have the capacity to develop materials (e.g., progress reports) using a tool called the *Assessment, Evaluation, & Programming System Interactive* (AEPSi; available at Brookes Publishing Company). The AEPSi is designed to increase efficiency for ABI programs because once data are entered into the online system; the interventionist can develop several products for measuring ABI outcomes. For example, the AEPSi can generate group and individual data for measuring children's progress and response to ABI. An interventionist might use the reports for goal development, intervention, ongoing assessment practices, sharing progress with others (e.g., families), and program evaluation.

Family Involvement

ABI family practices draw on many of the theoretical perspectives. The ecological systems, social learning, sociohistorical, and transactional theories are vital environmental factors associated with intervention and play an important role in effective service delivery. Service providers under the Individuals with Disabilities Education Improvement Act (IDEA) are in a unique position to not only serve young children with disabilities (and children at risk in some states), but also their families (Bruder, 2000; Brown & Conroy, 1999). Legislative actions have placed increased awareness and responsibility for early intervention (EI; birth to three) and early childhood special education (ECSE; three to six) programs to document and report results of IDEA service delivery efforts. The national Office of Special Education Programs and others have communicated recommendations so that young children can be served appropriately with an eye toward child and family outcomes (Bailey et al., 2006; Turnbull et al., submitted). Bailey and colleagues (2006) suggest families understand their child's strengths, abilities, and special needs, as well as help their child develop and learn.

Family-centered ABI practices are used to attend to these suggestions by Bailey and others. ABI programs typically serve children and families in home-based, community-based, or a combination of home and community-based settings. A family's concerns, priorities, and resources need to be well thought-out when applying ABI. *Family concerns* include issues the family would like to discuss, such as reliable transportation for their child to attend a neighborhood EI/ECSE program. *Family priorities* are issues the family perceives to be

important, such as the family's priority for their child to be included in neighborhood activities with peers. *Family resources* could be information, services, and/or support that are available and accessible to the family, such as a gas card supplied by the EI/ECSE agency for the family to drive their child to the neighborhood program.

Increasingly, programs are using ABI with family members (Woods & McCormick, 2002; Woods Cripe & Venn, 1997). The rationale for implementing ABI with families is that often young children's family members are the people with which children spend the most time. The social learning theory supports the idea that learning occurs through observation and family members can model and use ABI with their children. Innovative multimedia resources, such as a family video (Cripe, 1995) and website (Project Tactics http://tactics.fsu.edu/modules.html), have been developed to support families and caregivers in their use of ABI during everyday learning opportunities. A transactional perspective recognizes the give and take that happens in children's transactions with their families. Researchers have examined the effectiveness of families implementing intervention during routines and have found that families can provide a significant contribution to facilitating the development of skills (e.g., social communication) in their young children with disabilities (Wetherby & Woods, 2006; Woods, Kashinath, & Goldstein, 2004).

An ABI family-centered approach provides interventionists with a strategy for working with families/caregivers to increase the use of embedded learning opportunities during routine-based events (e.g., bathing, brushing teeth, and meals) within the child's home and across settings. ABI family-centered practice provides parents with tools to produce gains in their child's development across domains (e.g., fine motor, gross motor, communication, social communication, cognitive, and social).

Concluding Thoughts

Theories should not only provide a framework for ABI practice, but they should also serve as a foundation for conducting scientific research. Some have argued that research efforts, in the absence of theory, offer little in the way of a significant contribution to the knowledge base (DiMaggio, 1995; Sutton & Staw, 1995; Whetten, 1989). Designing and implementing quality research in special education (Gersten, Baker, & Lloyd, 2000; Odom, Brantlinger, Gersten, Horner, Thompson, & Harris, 2005), and building a body of research-based literature (Odom & Wolery, 2003) with an aim toward practice (Abbott, Walton, Tapia, & Greenwood, 1999; Smith, Strain, Snyder, Sandall, McLean, Ramsey, & Sumi, 2002), are significant endeavors for advancing knowledge and improving IDEA services for children and their families.

The ABI approach has been written about in journal articles and books (Bricker & Woods Cripe, 1992; Bricker with Pretti-Frontczak, & McComas, 1998; Pretti-Frontzcak & Bricker, 2004). Empirical work has started on studying relationships or aspects of ABI and naturalistic intervention within the context of teaching approaches in the form of comparisons between ABI and Direct Instruction (Losardo & Bricker, 1994; Werts & Losardo, 2006; Werts, 2007), strategies (e.g., time delay, embedding), environments (e.g. naturalistic, structured), developmental domains (e.g., communication, social, and motor), goals and objectives, and

content areas (e.g., early literacy) (Pretti-Frontczak, Barr, Macy, & Carter, 2003). A list of ABI research and practice journal articles is presented in the Appendix.

ABI is a research-based practice, with a theoretical foundation, for addressing the developmental and educational needs of young learners. Model ABI programs have: cognitive, developmental, ecological, learning, situated cognitive learning, social learning, sociohistorical, and transactional theoretical underpinnings. One theory alone cannot explain how children develop and learn, and as a result, ABI draws upon multiple and varied theories. Theory-driven ABI practices include quality professional development opportunities, links to an effective measurement system, and a strong family focused component that are steeped in a theoretical tradition. Effective ABI practices are supported by a solid understanding of theory.

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Appendix

Research and Practice Journal Articles Related to Naturalistic and Activity Based Intervention

Research	Practice
Autism	
Hancock & Kaiser, 2002 Kohler, Strain, Hoyson, & Jamieson, 1997 Kohler, Anthony, Steighner, & Hoyson, 1998 Wetherby & Woods, 2006 Woods & Wetherby, 2003	Macy, Sharp, & Chan, 2006 Schwartz, Billingsley, & McBride, 1998
Communication	
Halle, Alpert, & Anderson, 1984 Hemmeter & Grisham-Brown, 1997 Schwartz, Carta, & Grant, 1996 Schwartz, Anderson, & Halle, 1989 Sigafoos, Roberts, Kerr, Couzens, & Baglioni, 1994 Warren, 1992	DiCarlo, Banajee, & Buras-Stricklin, 2000 Duchan, 1997
Embedded Learning Opportunities (ELO) & Naturalistic Learning Opportunity	
Brigman, Lane, Switzer, Lane, & Lawrence, 1999 Caldwell, Wolery, Werts, & Caldwell, 1996 Daugherty, Grisham-Brown, Hemmeter, 2001 Doyle, Schuster, & Meyer, 1996 Dunst, Bruder, Trivette, Hamby, Raab, & McLean, 2001 Fox & Hanline, 1993 Grisham-Brown, Schuster, Hemmeter, & Collins, 2000 Horn, Lieber, Li, Sandall, & Schwartz, 2000 Johnson & McDonnell, 2004 Johnson, McDonnell, Holzwarth, & Hunter, 2004 Jolivette, Stichter, Sibilsky, Scott, & Ridgley, 2002 Macy & Bricker, 2007 McDonnell, Johnson, Polychronis, & Riesen, 2002 McDonnell, Johnson, Polychronis, Riesen, Jameson, & Kercher, 2006 Polychronis, McDonnell, Johnson, Riesen, & Jameson, 2004 Pretti-Frontczak & Bricker, 2001 Sewell, Collins, Hemmeter, & Schuster, 1998 Schepis, Reid, Ownbey, & Parsons, 2001 Stowitschek, Laitinen, & Prather, 1999 Tate, Thompson, & McKercher, 2005 Woods, Kashinath, & Goldstein, 2004 Wolery & Anthony, 1997	Dunst, Herter, Shields, & Bennis, 2001 Dunst, 2000 Haertig Sadler, 2003 Macy & Bricker, 2006 Milagros Santos & Lignugaris-Kraft, 1997 Rule, Losardo, Dinnebeil, Kaiser, & Rowland, 1998 Woods Cripe & Venn, 1997 Woods & McCormick, 2002
IEP/IFSP Goals and Objectives	
Malmskog & McDonnell, 1999 McBride & Schwartz, 2003 Peck, Killen, & Baumgart, 1989 Pretti-Frontczak & Bricker, 2000	Grisham-Brown & Hemmeter,1998 Grisham-Brown, Pretti-Frontczak, Hemmeter, & Ridgley, 2002 Wolery, Gessler Werts, & Holcombe, 1994
Motor	
Apache, 1998	Block & Davis, 1996

Apache, 2005	
Other Approaches v. ABI	
Losardo & Bricker, 1994 (Direct Instruction)	Novick, 1993 (Developmentally Appropriate Practice)
Time Delay Procedure(s)	

Chiara, Schuster, Bell, & Wolery, 1995
Ficus, Morse, Schuster, & Collins, 2002
Riesen, McDonnell, Johnson, Polychronis, & Jameson, 2003
Venn, Wolery, Werts, Morris, DeCesare, & Cuffs, 1993
Wolery, Anthony, Snyder, Werts, & Katzenmeyer, 1997
Wolery, Anthony, Caldwell, Snyder, & Morgante, 2002