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Special Section on Early and Intensive Behavioral Intervention in Children

Behavioral Development Bulletin
A BAO Journals Publication

Special Section on Early and Intensive Behavioral Intervention in Children

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■ MISSION STATEMENT

BEHAVIORAL DEVELOPMENT BULLETIN publishes developmental articles, theoretical and conceptual papers, brief research reports, review articles, news, and announcements. Please submit your articles to Dr. Martha Pelaez, Editor, Department of Educational and Psychological Studies, College of Education, Florida International University, Miami, Florida 33199, and Michael Lamport Commons, … Three photocopies of each manuscript, which meet the submissions guidelines posted at http://www.behavioraldevelopmentbulletin.com, should be submitted to the Editor for review. Reproduction for scientific and scholarly purposes of any material published in this Bulletin will be permitted following receipt of a written request. It is understood that authors would not submit the same manuscript to more than one journal without permission.

The special section on Behavioral Assessment and Intervention in Children is a part of the Behavioral Development Bulletin. Its mission is to provide up to the moment information on critical issues and research in early intervention and intensive behavioral interventions. It perceives itself as being a primary source of information for those who work within the field of early childhood

interventions and intensive interventions from a behavioral perspective. Topics will include issues, literature review, and research on successful interventions for children with various mental health, medical (pain, obesity, etc.) or developmental disorders. In addition, articles and research conducted on organizational behavior management to facilitate program design and development of early intervention centers will also be accepted.

Developmental Psychology is one of the largest subdisciplines of psychology, and yet is one of the smallest subdivisions of Behavior Analysis. Our description of the field is written on our webpage for the Behavior Developmental Bulletin and in a Wikipedia entry. There are three goals. One is to understand all of development, including evolution, in behavioral terms. The second is to reach out to Developmental Psychology with the innovations that Behavior Developmental approaches have provided. Third, we see Behavior Analysis as providing interventions that measure and promote development. That means that we are interested in educational and clinical interventions that stimulate and increase the likelihood of development. Under the topic of the measurement of development that includes what are the sequences of development in different areas.

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Begin with the most important information, but don't waste space by repeating the title. Include in the abstract only the four or five most important concepts, findings, or implications. Embed as many key words and phrases in the abstract as possible; this will enhance the user's ability to find the citation for your article in a computer search. Include in the abstract only information that appears in the body of the paper.

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- Spell out names of tests
- Use generic names for drugs (when possible)
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Use the present tense to describe results with continuing applicability or conclusions drawn and the past tense to describe variables manipulated or tests applied. Use the third person, rather than the first person for as much as possible.

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- All articles should be single spaced, with one inch margins all around.
- All abstracts must contain keywords. Full author contact information must be included in the article.
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Thank you!

The Benefits of Attachment Parenting for Infants and Children: A Behavioral Developmental View

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Abstract

Parents of infants and young children face many challenges when dealing with negative emotions such as crying, distress, fear and anger. If children experience such emotions chronically, and these are not mitigated by parents, evidence suggests that the stress can result in irreversible brain damage. These changes can increase the likelihood of serious problems in children's development. This paper shows that the use of Attachment Parenting practices both with infants and with older children can greatly reduce the child's stress and by so doing may produce both physical and psychological benefits. The major benefits occur as the result of the mitigation of potentially overwhelming negative emotional states. With infants, the specific Attachment Parenting practices include co-sleeping, breast feeding on demand, extensive carrying and holding of infants, and rapid response to infant crying. These have been shown to be associated with less crying and other expressions of distress. The effectiveness of these stress-reducing behaviors is probably due to the high degree of responsiveness to infant signals. Parents who bottle feed instead of breast feed, for example, or those who have their infants sleep nearby but not necessarily in the same bed can also practice highly responsive parenting. For older infants and children, Attachment Parenting consists of continuing to be highly responsive to the child, which especially includes behaviors that help children better regulate emotional states such as distress, fear and anger. The benefits that are discussed include less exposure to stress, which effects brain development and later reactions to stress. This has been shown to reduce mental health problems in later development. Another important psychological benefit is secure attachment, which is the tendency of the child to seek contact with a parent when distressed and to be effectively consoled by that contact. The result of more effective emotion regulation and secure attachment during infancy and childhood is that children engage more effectively with essential developmental tasks, including peer relationships and schooling.

A number of behaviors of infants and children present challenges to parents. For example, some infants may cry often and be difficult to console. Some older infants as well as children can be described as being overly fearful and anxious. They do not seem to engage easily in new situations with peers or teachers who act sometimes act in lieu of parents in this culture. Other children may act out in a variety of ways, grabbing toys, hitting children or adults, or engaging in other aggressive behaviors. All of these examples involve emotion and its regulation, or rather, its lack of regulation. Emotion regulation is something that develops throughout childhood, and to some extent, even into adolescence and adulthood.

When children of any age are distressed, angry or fearful, especially if these emotions are experienced chronically and parents and other caregivers do not mitigate them, the stress that results can have irreversible deleterious effects on the child's brain development (see Gunnar, 1998; and the National Council on the Developing Child, 2005 for summaries). Such damage increases the likelihood of severe problems in a large percent of children who incur it.

These stress-producing emotions in infants and young children may be reduced by child-centered parenting called Attachment Parenting. We will show that there are both physical and psychological benefits to Attachment Parenting techniques. The physical benefits include less stress, with its possible resultant effects on brain development. The psychological benefits are greater emotion regulation as well as a more adaptive attachment relationship to parents and to significant others. Finally, because Attachment Parenting has rarely been discussed as applying beyond the period of infancy, we will propose ways in which it can be implemented in older children, thereby continuing the goals of stress reduction, emotion regulation and attachment in those children.

■ ATTACHMENT PARENTING WITH INFANTS

The term Attachment Parenting (AP) was introduced by a number of researchers and practitioners, starting in 1998 (Frissell-Deppe, 1998; Granju, 1999; Sears & Sears, 2001). Publications using related terms (e.g. empathic parenting or natural parenting) also appeared around that time (Hunt, 2001, as cited in Schön & Silvén, 2007). The heart of AP, according to Sears and Sears (2001) is learning to read the cues of the baby and to respond appropriately to those cues. Parenting in this view is child-centered and not parent-centered.

A parent-centered child rearing technique is seen in a typical U.S. parent's approach to children's bedtimes (Richman, Miller & Solomon, 1988). American parents believe that having a specific bedtime is good for infants and children. A great deal of parental behavior in the U.S. is directed toward putting infants and children to bed at a specific time. This is done irrespective of whether the infant (or child) is ready for sleep. A more child-centered strategy is described by New (1988) in the same volume. In the Italian households that she studied, there was no specific bedtime for infants. Infants were included in the evening family rituals and were only put to bed if they fell asleep. In the Italian case, it is the infant's own sleepiness that serves as the signal to help them fall asleep and then put them to bed. In the American case, it is the parent's time-based rule that serves as the signal to put the child to bed. Perhaps not surprisingly, a number of researchers (e.g. Green, Groves, & Tegano, 2004) have related the parent-centered bedtime practices of American families to a greater use of transitional or security objects in infants and young children, and the need for bedtime routines (see Jenni & O'Connor (2005), for an extensive discussion).

AP is identified by some as a fixed approach in which the parent must breast feed exclusively and on demand, hold and carry the baby most of the time, co-sleep, and respond quickly to the baby's crying. That is not a correct view, however. Sears and Sears (2001) argue instead that parents might work or bottle feed and still be using AP, if their own parenting behavior is still as child centered as possible. These authors also argue that any parenting behavior, including holding, feeding and co-sleeping could be applied in a way that is not responsive to cues from the infant. What is most important is not the specific behavior, but whether or not it is responsive to cues from the infant.

It is nevertheless true that breast feeding on demand, holding, co-sleeping and responding quickly to infant crying are still a very important part of AP as it is practiced with most young infants. The reasons for this are several. First, and most importantly, these behaviors tend to be exactly what most young infants need. As long as they are used in a child-centered way they can have multiple beneficial effects, including helping infants to regulate their emotions, particularly those of distress, and promoting attachment to the caregivers.

According to Sears and Sears (2001), AP minimizes stress in infants, and results in children who are more psychologically healthy and resilient. It may, as a result, protect children from the negative effects of stress. It also promotes infants' secure attachment to parents and closer attachments to others. This notion of secure attachment has been extensively studied by Ainsworth and her colleagues (e.g. Ainsworth, Blehar, Waters & Wall, 1978; Weinfeld, Sroufe, Egeland & Carlson, 1999). In their work, a securely attached infant or child is one who appropriately relies on their parent for comfort and support, particularly when stressed, afraid or ill. These benefits of AP will be discussed more below.

PHYSICAL OR PHYSIOLOGICAL BENEFITS OF ATTACHMENT PARENTING WITH INFANTS

As argued in a number of sources (e.g. Barr, Konner, Bakeman & Adamson, 1991; Konner, 1977; LeVine et al., 1994; Schön & Silvén, 2007) the practices that are part of AP were adaptive in the environments in which humans originally evolved (the Environment of Evolutionary Adaptedness, or EEA, Bowlby, 1969). Because early humans lived in precarious circumstances in terms of possible exposure to predators as well as disease, it would make sense to keep infants as close as possible to an adult (as seen in co-sleeping and holding). Attending quickly to crying would help to maximize infant survival because crying might indicate current hunger, but also longer term conditions such as illness. Similarly, breast feeding on demand could be protective when infants are ill. LeVine et al. (1994) went so far as to say that some cultures have a *pediatric model* for infant care. In those cultures, a parent's most important goal is protecting the health and survival of the infant. That goal is reflected in how they interact with their infant. Such interactions include the AP behaviors already mentioned. From an evolutionary psychological perspective, having this kind of parenting would increase the likelihood that the parents' genes would be passed on.

Below, arguments about the physical benefits of AP practices will be presented in some detail. In almost all cases, the original studies of these issues were naturalistic, often anthropological or cross-cultural studies, of parenting practices. Their purpose and effects in the cross-cultural studies could only be inferred. As is possible, the naturalistic and anthropological data will be supplemented with existing quasi-experimental or experimental literature.

Co-sleeping. At the present time parents and infants sleep together in many cultures (see Jenni & O'Connor, 2005; McKenna, Ball & Gattler, 2007). Parents could be sometimes mothers or fathers only. These cultures include the !Kung San in southern Africa (Barr, Konner, Bakeman & Adamson, 1991; Konner, 1977), the Gusii of Kenya, studied by LeVine et al. (1994), the Mayans studied by Morelli et al. (1992), and many others (e.g., Latz, Wolf, & Lozoff, 1999; Welles-Nystrom, 2005). This practice generally lasts until the mother's next child is born, but can last into childhood (Welles-Nystrom) or even beyond (Caudill & Plath, 1966; Takahashi, 1990). It is primarily among white middle class parents in the U.S. and in some European groups that co-sleeping is not so common.

Reported rates of co-sleeping are found to vary somewhat from study to study, as would be expected from studies based on different samples. Studies in the U.S. have reported from 0% co-sleeping in the first few months of life (Morelli et al., 1992) to up to 15% (Latz, Wolf & Lozoff, 1999). McKenna (2007) reports that what seems most true is that many U.S. infants (as many as 68%) will sleep in their parent's bed at least some of the time. Many such parents will continue to report that they are not co-sleepers, especially if they are concerned about the reactions of their pediatricians. Note that those interested in a more extensive review of the history, prevalence and other information about co-sleeping can consult the studies above, as well as additional discussions by Schön and Silvén (2007), McKenna (2007) and Small (1998).

The original physical benefits of co-sleeping were thought to be protection from predators and allowing the infant to continue to breast feed on demand (see McKenna, Ball & Gettler, 2007). In the contemporary world, co-sleeping still provides the

important benefit of allowing breast feeding to take place more easily and frequently, with less wakefulness in the mother. In addition, McKenna and colleagues have argued that it may be associated with a reduction in Sudden Infant Death Syndrome (SIDS). The main reason for this is that an infant who sleeps "separated from the physiological regulatory effects of its mother's body is sleeping in an environment for which it is not designed biologically…" (McKenna, Ball & Gettler, 2007, p. 141). In other words, the mother's breathing and other behaviors help the infant to better regulate its own physiological functions, including breathing. McKenna and colleagues present both experimental and non-experimental evidence to support this view. In the laboratory, they have shown that both mothers and infants spend more time in lighter sleep states when co-sleeping. Both because of this and because of more frequent breast feeding, they believe that infants may be more likely to be able to arouse themselves should they have a serious episode of apnea sleep. Cross-cultural evidence provides some indirect support for McKenna's view, in that cultures in which parents and infants co-sleep have much lower incidences of SIDS (McKenna & Mosko, 1990).

Co-sleeping, in the U.S. context, is still controversial. The American Academy of Pediatrics, citing epidemiological data from two studies, have recommended against co-sleeping (American Academy of Pediatrics, 2005b). As McKenna and colleagues have argued about the Academy report, there continue to be many factors that are not controlled or even examined in many of the epidemiological studies, including maternal drug and alcohol use, fatigue, smoking, and bedding type. At the same time, the Academy recognizes that infants who sleep alone in a separate room have increased SIDS risk, and suggests that parents should have their infants in their rooms, if not in their beds. McKenna (2007) continues to be a strong supporter of co-sleeping, but he also describes ways to get as close to co-sleeping as possible, for example, by using a small bed that is either next to or attached to the parent's. It should be noted that modern sleeping arrangements were almost surely generated for reasons other than co-sleeping and do not inherently make for safe co-sleeping. A better co-sleeping environment would be one large mattress (perhaps even larger than King-sized) on the floor of a bedroom. Children could be well within reach, but not squashed into a double or queen-sized bed, not situated between two sleeping adults, not several feet off the floor, and not exposed to gaps between mattresses or between mattresses and a crib side. The latter situation – the gap between a crib mattress and the crib sides - has itself resulted in a number of deaths, including recently (see "Cribs recalled after two infant deaths", Fox News, October 21, 2008).

Breastfeeding on demand: When mothers sleep next to or very near to infants this facilitates breastfeeding. In many cultures breast feeding on demand both at night and during the day typically continues into the second year, and perhaps beyond, along with co-sleeping. In their studies among the Gusii of Kenya, LeVine et al. (1994) argued that frequent breast feeding has played an essential role in cultures where infant mortality was very high. It helps to ensure early weight gain and the possible maintenance of hydration in the presence of diarrhea. Among the !Kung

San, breast feeding is even more frequent than among the Gusii, occurring in some mothers at some times up to four times an hour (Barr, Konner, Bakeman & Adamson, 1991; Konner, 1977). These authors have made similar arguments about the importance of on-demand breastfeeding for infant health and survival.

For modern societies, in which health risks are not present to such a great extent, breast feeding on demand still provides health benefits for infants (as well as mothers). The Academy of Pediatrics' (2005a) recent report on breastfeeding lists a large number of such benefits, including a reduction in a number of diseases during infancy (even in developed countries), decreased rates of SIDS, a reduction in later rates of diabetes, certain cancers, obesity and asthma in older children, and even some benefits in terms of a child's cognitive development. Despite the many benefits of breast feeding, the rates of maternal initiation of breast feeding remain at about 70% in the U.S., with only about 33% continuing to breast feed to any extent 6 months postpartum.

Even though this same Academy report (2005a) states that infants can continue to breastfeed as long as this is mutually desired by both mother and infant, there are few studies of the benefits or detriments of breast feeding beyond about the first year. Based on comparisons of weaning ages of related primates, Dettwyler (1994) has argued that the natural weaning age for humans falls somewhere 2.5 and 6 years of age. She also notes that the human immune system does not become fully mature until age 6, so that a continuation of breast feeding until that age might be maximally protective. In one of the few studies that have been conducted of AP parents, an average age of weaning of about 4 to 5 years has been reported (Sugarman & Kendall-Tackett, 1995). It has been suggested (Baldwin, 2001) that following a practice of child-lead weaning is most congruent with AP ideas.

Holding and touching: In cultures such as the !Kung San (Barr, Konner, Bakeman and Adamson, 1991; Konner, 1977) and the Gusii, as well as others, infants, particularly young infants are held almost continuously, if not by the mother than by somebody else. For example, among the !Kung San, babies were in physical contact with someone more than 75% of the time during the first 20 weeks of life and more than 50% of the time until about 50 weeks. Among the Gusii, holding and physical contact occurred in about 80% of observations before 6 months, and about 50% between 9 and 12 months (Richman, Miller & Solomon, 1988). Richman, Miller and Solomon reported that, in contrast, U.S. mothers held their infants about 45% of the time at age 4 months, and only about 20% of the time at 10 months. Most of the remainder of the time, the younger American infants were placed into containers such as infant seats. Older infants might be as likely to be placed on the floor, to allow for exploration.

LeVine and colleagues (1994) consider the high rates of holding seen in settings in which infants are more vulnerable to be important for both the health and survival of the infants, as also discussed by Richman, Miller and Solomon. In the Environment of Evolutionary Adaptedness (Bowlby, 1969) holding would have been adaptive primarily in terms of protection from predators including other hominids.

A major benefit of holding infants in contemporary settings would be a reduction in their rate of crying. Hunziger & Barr (1986) assigned mothers of normal infants to two groups. In the "supplemental holding" group, mothers were asked to increase the time that they spent in supplemental holding, which was defined as holding that was not done in direct response to crying or while feeding. These mothers were found to hold their infants, on average, 1.8 hours more per day, and their infants cried and fussed on average 43% less at the peak time for infant crying (6 weeks). In a related study, St. James-Roberts et al. (2006) compared parents who held their infants a great deal of the time (on average 15 to 16 hours per day) versus those who held them much less. They found that the infants who were held much less cried 50% more overall.

There may be both physical and psychological benefits to reduced crying. LeVine and colleagues (1994) have argued that, in environments with higher infant mortality, minimizing caloric expenditure due to excessive crying and too much activity may improve infant survival. This benefit is likely to be less important for infants living in less vulnerable environments, but a reduction in infant crying could also affect how stressed infants and their caregivers might be. Soltis (2004), for example, summarizes literature suggesting that infant crying is an important cause or at least precipitating event for abuse and maltreatment in a number of cases.

Responsiveness to crying. Mothers whose behavior can be described as following the pediatric model tend to respond rapidly to crying, as well as showing high rates of holding and touching, as would also happen with AP. There is evidence (presented above) that non-contingent holding is related to lower rates of crying in infants, at least in young infants. What are the effects of responding to infant crying? This topic overlaps somewhat with the topic of infant holding, since picking up and holding would be a frequent response to crying, along with other behaviors. The distinction is that here, what is being looked at is the presence of a contingent response. The research on responsiveness to crying has not looked at the specific nature of responses to crying, only at how often parents (usually mothers) respond.

There has been disagreement on what the effects of responding to crying are. In 1972, Bell and Ainsworth reported that consistent and prompt maternal responding to the crying of infants during the first few months of life was related to a reduction in the frequency and duration of infant crying late in that first year. This might be interpreted as going against a behavioral view, which could suggest that responding to crying with attention and holding would reinforce its occurrence. Gewirtz and Boyd (1977), in fact, criticized the Bell & Ainsworth findings on a number of methodological grounds. Their most notable criticism was that Bell and Ainsworth were not looking at maternal responsiveness at all. Instead, they were looking at maternal ignoring of crying, and whether that was associated with later higher rates of crying. They assumed that maternal ignoring and maternal responsiveness would be reciprocal to each other, but they did not demonstrate that.

Gewirtz and Pelaez-Nogueras (e.g. 1991) have more recently presented results showing that in the case of separation protest at least, maternal responses can increase the frequency of such protests. Note that they used somewhat older infants, so this research would not necessarily contradict the Bell & Ainsworth (1972) finding. Hubbard & van Ijzendoorn (1991), in an attempted replication of the Bell and Ainsworth (1972) study, reported that maternal unresponsiveness to crying was associated with less crying overall. Although this would actually support the learning point of view, the finding also is problematic because it did not examine responsiveness directly, only unresponsiveness.

The safest conclusion appears to be that some kinds of crying, in some situations, could be reinforced by being responded to. Which types of crying, and when or how, remains to be established. The reason for this uncertainty, as also argued by Miller & Commons (2001), is that there has been no complete functional analysis of crying. Such a complete analysis would need to take into account a number of factors that have not been explicitly included in the above work.

First, it has been shown repeatedly that crying has a normal developmental course that is found across cultures (Barr, 1990; Barr et al., 1991). These studies show that crying increases over the first few weeks of life. The peak frequency of crying occurs at 6 weeks. There is then a gradual decrease in crying until about 3 or 4 months, after which it remains somewhat stable. Any study of crying, therefore, has to take into account the fact that it will normally tend to decrease over time, on average. This decrease must to some extent be independent of parental intervention, since it occurs in a large variety of cultures with different kinds of parental interventions.

Second, there are two variables that need to be taken into account: the type of cry that is being responded to; and the age of the infant. Even in the Gewirtz & Boyd (1977) paper, they mention that responding to cries that were elicited by some kind of physiological event would not tend to lead to increased crying, except in the case that the same elicitor occurred again. A related factor to this is the age of infant. For the youngest infants, crying is their primary mode of communication. Many more of the communications infants engage in are of the elicited type. As suggested also by the above findings on the developmental course of crying, this kind of crying may naturally decrease over time. Parents are also not well acquainted with the infant at first. Conscientious parents are likely to respond to most cries. Nevertheless, over time, these early cries tend to decrease.

Third, it is very important to consider where in a "cry bout" the response occurs. Crying is generally preceded by a series of behaviors. These might include an initial change of facial expression (to a more serious expression or even a grimace), increased bodily agitation, initial fussing sounds, looks to the mother, and other behaviors. These behaviors, along with the actual crying that occurs toward the end of that sequence, constitute a "cry bout." If the mother intervenes at any point during these initial behaviors, crying may never occur at all, and so could not be reinforced. It would be expected that a highly responsive parent would learn to recognize the early signs of distress and intervene before actual crying occurred. So sensitively responding by parents does not reinforce crying.

It is also important to realize that, at the same time that crying is beginning to decrease as the infant gets older, a separate communicative system of babbling, smiling and other interactive

behaviors is becoming increasingly reinforced and elaborated. The studies of crying have examined crying as if it is developing without relationship to other important behavior systems, such as this one. The development and elaboration of these new communicative behaviors can change what happens with crying in at least two ways. First, infants will gradually learn to communicate what they want using non-crying gestures and then verbalizations. Parents' responses can reinforce the use of these alternative communication methods. Second, parents can use positive interactive routines to distract infants if they are beginning to become distressed.

One likely conclusion, given the above analysis of the "responsiveness to crying" issue is that there is every reason to expect that a high degree of responsiveness to early signs of distress in infants, those signs that occur before actual crying, should not lead to higher rates of crying, since crying itself may only rarely occur. Such rapid responsiveness is more likely to occur when infants are being held and otherwise kept close by a caregiver, such as is the ideal for AP parenting. Parents who are very responsive and keyed into their infants' signals are also likely to spend increasing amounts of time interacting with their infants in positive ways. This will lead to the development of a positive communication system, which will gradually and increasingly replace crying.

PSYCHOLOGICAL BENEFITS OF ATTACHMENT PARENTING

In developed and developing nations today, of course, infants are at much less risk for early death. There would seem to be less justification for the use of Attachment Parenting practices in terms of their benefits for physical survival. More importantly for those concerned about children is that there is increasing evidence that Attachment Parenting practices produce important psychological benefits that in turn have associated physiological benefits as well.

The most important psychological benefit of AP practices is that they minimize infant stress. This is true both during the first two- to three-months of life, when the infant is first establishing regulation of feeding, sleeping and arousal, and after (Emde, 1998; Emde, Gaensbauer & Harmon, 1976; Sander, 1975). During the early months of life there are many occasions when infants can become distressed. They cannot feed themselves, may continue to wake up during the night, and may cry for a number of other reasons. Crying is highly stressful, both for adults who hear it and for infants (e.g. Frodi & Lamb, 1978). Particularly during early development, research suggests that stress can have long term deleterious effects on the child's physical and psychological development.

There are two ways in which chronic stress at any time during the lifespan, and stress during early development in particular can be detrimental. Each of these will be discussed in turn.

There is an increasing amount of research on the influence of stress on the immune system and disease at various points in the lifespan. Exposure to chronic stress seems to be associated with physical disorders (for example, cardiovascular disease, cancer) and also psychological disorders such as depression and anxiety (see McEwen & Seeman, 1999). In some studies, exposure to high amounts of cortisol as a result of stressors has been shown to result in damage to the hippocampus (involved in learning and memory; e.g. Lupien et al., 1998) and the amygdala (involved in the processing of emotions; e.g. Wolterink et al., 2001)

Stressors that occur early in development can have an irreversible impact on the hypothalamic-pituitary-adrenocortical (HPA) axis and on the production of neurohormones, such as cortisol (e.g. Gunnar, 1998; Gunnar, Broderson, Krueger & Rigatuso, 1996), which are involved in the stress response. According to the extensive studies of Gunnar and colleagues, at birth, the human adrenocortical system is very responsive to stimulation. Therefore it can be more easily affected by experience. As can be seen from everyday observation, even minor events such as being undressed can be very distressing for many newborns. Measurements of cortisol levels during these situations show that there are also elevations in cortisol (Gunnar, 1992). Some infants, perhaps those who are temperamentally more reactive, and/or those who experience more situations that elicit distress (such as being left to cry alone for long periods of time), may experience multiple situations on a daily basis that result in high levels of stress hormones.

Long term effects of early stress: There is an increasing amount of research, with humans and with other animals, showing that early stress can have a number of detrimental effects on development. The work with animals is helpful in clarifying both what specific events are stressful, and what the effects of stress are on both the brain and on development. Experimental work on animals investigating these topics is more likely to be proposed and approved. By examining similar situations, generally non-experimentally, the research with humans can nevertheless show analogous behaviors and effects.

The long-term effects of stressful early rearing conditions have been experimentally investigated in nonhuman animals (e.g. Rosenblum et al., 1994; Suomi, 1987, 1991). For example, using rhesus monkeys, Suomi and colleagues have been investigating the differential effects of being reared by their mother in the traditional way or by being separated from the mother and being reared by peers. Although the peer-reared monkeys seemed to develop relatively normal social behavior as long as they were in familiar settings, when exposed to stressors, such as separations from other monkeys, they exhibited much more behavioral disruption, and a greater activation of the hypothalamic-pituitary-adrenal axis and other systems involved in dealing with stress. In more recent work, Suomi has found that there are also important individual differences in the reactivity of different individual monkeys both to the different rearing conditions and to the stressors. He has reported (e.g. Suomi, 1987) that roughly 20% of rhesus monkey infants can be labeled as highly reactive. Even when mother-reared, these monkeys will show much more extreme behavioral and physiological reactions to stressful situations. Such monkeys, for example, appear fearful in novel situations and have heightened levels of cortisol and ACTH (Adrenocorticotropic hormone). These patterns of behavior, both from monkeys who were reared by peers, and in the highly reactive monkeys, have been found to persist into later development.

Rosenblum and colleagues (1994), concerned that many of the studies of early stressful rearing conditions relied overly much on environmental conditions that were too severely

stressful, devised a situation in which infant monkeys were raised either by mothers who had an easy time foraging for food in a simulated foraging situation (Low Foraging Demand) or by mothers who had a more difficult time foraging (Variable Foraging Demand). Mothers under VFD conditions were assumed to be providing less than optimal caregiving which was somewhat stressful for their infants. The infants raised under VFD conditions were found to be behaviorally more timid, less social and more subordinate in their relationships with others, and as young adults responded differently to chemically administered stressors. Rosenblum and colleagues concluded that this was evidence that the neuronal systems involved in the stress response were permanently changed by exposure to this early stressful situation.

In humans, there has also been considerable work showing long-term effects of early traumatic experiences. The results of this work are concordant with the animal data. For example, Luecken (1998) found that adults who had lost a parent before the age of 16 showed a variety of less optimal cardiovascular and neurohormonal outcomes, including elevated blood pressure and cortisol, when engaged in tasks designed to be stressful. Studies have shown that infants subjected to early trauma or abuse also show differences in stress reactivity and brain development that continue into later childhood and adulthood (e.g. Essex, Klein, Cho & Kalin, 2002; Ito, Teicher, Glod, & Ackerman, 1998; Perry, 1997). It is important to emphasize that while some of the literature discusses primarily extreme situations, such as abuse or abandonment, other literature discusses stressors that a significant number of children are exposed to, including low socioeconomic status (Lupien et al., 2000), stress due to maternal depression (e.g. Ashman et al., 2002; Essex et al., 2002) and simply 'low quality maternal behavior' (Hane & Fox, 2006). Much of this research has been summarized in a recent report from the National Scientific Council on the Development of the Child (2005).

Do AP behaviors reduce reactions to stressful situations? One may conclude that early stressful situations elevates the chance of having long terms deleterious effects in humans and in other animals and is therefore important. In the context of the current paper, it is also important to mention that the kinds of touching and holding emphasized by AP have been shown to either reduce the effects of stressful early experiences or to result in more positive reactions to stress. For example, Blass and Barr (2000) found that the presence of a caregiver can moderate the negative physiological effects of a stressful medical procedure in human infants. In another study, toddlers exposed to a situation designed to produce wariness or mild fear, showed no elevations in the stress hormone cortisol when a parent to whom the child was securely attached was present. Toddlers who did not have secure relationships with their parents did show cortisol elevations (Nachmias et al., 1996). In an experimental study with nonhuman primates (Levine & Wiener, 1988), contact with mother was also shown to reduce stress reactions. Although it is harder to document long term effects, there is suggestive evidence from the experimental studies of Meaney and his colleagues. In one such study, Liu et al. (1997) found that infant rat pups that are licked and groomed more by their mothers showed, as adults, reduced hormone release in response to extreme stress.

The relationship between the use of AP and secure attachment: There is a considerable amount of research that shows that a mother's sensitivity to infant signals is significantly related to secure attachment of that infant to that mother. This has been found in the original studies of Ainsworth and her colleagues on this topic (e.g. Ainsworth et al., 1978) and in more recent studies in which the concept of maternal sensitivity has been broadened to better fit a variety of situations as well as the dyadic nature of the mother-infant interaction (for examples, see work by van den Boom & Hoeksma, 1994 and the NICHD Early Child Care Research Network, 1997). These studies did not explicitly examine the AP behaviors discussed here. They simply examined responsiveness of any kind. Because responsiveness involves sensitivity to infant cues, the findings nevertheless are most likely related.

Being rated as securely attached has been related to a large number of positive outcomes in both infants and children (see Martin & Britner, 1999; Thompson, 1999; Weinfield et al., 1999 for extensive reviews). Some of the positive outcomes include: a) responding in a more flexible way when placed in a frustrating situation, b) seeking help from adults more appropriately, c) showing more persistence and enthusiasm in problem solving situations, d) showing greater competence in interaction with peers, and e) showing greater understanding of both self's and other's emotions.

None of the work cited above looked specifically at the AP behaviors being discussed here. One of the few studies to do so (Anisfeld, Casper, Nozyce & Cunningham, 1990) found that when low-income mothers were assigned to carry their young infants more, their infants were more likely to be securely attached at 13 months. Some of the other literature that supports the idea that AP may lead to more secure attachment is cross-cultural. In the Dogon culture (True, Pisani & Oumar, 2001), who breastfeed on demand, hold their infants a large portion of the time, respond quickly to crying, and co-sleep, 87% of infants were found to be securely attached, according to criteria used in the original Ainsworth study (Ainsworth et al., 1978). In middle-class American households, the rate of secure attachment is reported to be around 65% (Ainsworth et al 1978) or even somewhat lower in some samples. The remaining infants among the Dogon were classified as "resistant" rather than secure. A "resistant" infant is one who, although extremely upset by being separated from the mother, engages in angry-appearing behavior (pushing away, getting off the mother's lap, even though they are still crying). As a result, they are not able to be easily consoled. In Japanese infants, who also experience a great deal of holding and who co-sleep with their mothers, security of attachment was similar in frequency to that seen in American infants, with the remaining infants being classified as resistant (Takahashi, 1990; see also Rothbaum et al., 2000). Both Takahashi (1990) and LeVine and Miller (1990) argued that in cultures in which mothers and infants spend a great deal of time being physically close, such as the Japanese culture, that the separations that occur in the situation in which attachment is assessed can be so upsetting for the infants that they will not

be easily consolable by their mothers. They may, as a result, end up being classified as resistant.

Other Positive Socialization Benefits of Attachment Parenting: There may be other benefits of Attachment Parenting. One such benefit could be a closer sense of "connection" to other people. Because physical contact and touching is a less salient aspect of Western, and particularly Northern European cultures, this possible benefit has rarely been studied. At the very least, parents who engage in highly responsive caregiving serve as models for their children. Thereby they may promote higher frequencies of responsive and even empathetic behavior toward others, as also noted by Bandura (1989). Some anthropological studies (e.g. Hewlett, Lamb, Leyendecker & Schölmerich, 2000) support the idea that warmer and more responsive caregiving are associated with cultures that are more trusting and accepting.

■ ATTACHMENT PARENTING WITH OLDER INFANTS AND YOUNG CHILDREN

During the early months Attachment Parenting practices can be highly beneficial for both physical and psychological development. According to some research, it can also prevent long term negative effects of stressful child-rearing practices, such as having infants sleep alone and not responding when they cry. As infants continue to develop in many ways including attachment (Commons, 1991), their behavior and physiology changes. According to Gunnar (1998), during the period between 3 and 12 months there is a relative decrease in cortisol reactivity in a variety of stressful situations, even when behavioral evidence of distress to these situations may continue. During this same period of time, infants' frequency of crying decreases, and their frequency of other vocalizations, gestures, and positive emotional expression increases. Infants also become increasingly mobile, particularly in the second half year. Emde and others (Emde, 1998; Emde, Gaensbauer, & Harmon, 1976; Sander, 1975) see the new behaviors that appear around 7 to 8 months as representing a second biobehavioral shift. These new behaviors do make infants more able to initiate actions on their own and therefore less dependent upon caregivers.

Nevertheless, human infants continue to be quite helpless, and to rely a great deal on caregivers, particularly to help regulate negative emotions. To what extent does it still make sense for the parent to continue to follow the child's lead, at least in dealing with emotional development?

In responding to this question, it needs to be understood that developmental changes in the child should naturally bring about changes in the AP practices discussed thus far. Clearly, for example, as children become more mobile, they will spend more time away from their parents and not being held. As research has also shown (e.g. Anderson. 1972) when the child initiates the departure from contact, and can rely on the parent remaining in the same location, they are more likely to freely explore. When the parent initiates the separation, children have a great deal more trouble coping. In this case, children will be more likely to protest and if possible to return to the parent's side (e.g. Ainsworth et al., 1978).

As foods other than breast milk are introduced, the frequency of breast feeding will naturally decrease, although breast feed-

ing may continue for variable periods of time. One interesting, although nonscientific, small-sample study, reports that among parents who practice Attachment Parenting, 44% were still breast feeding when their children were 3 years of age, with 2.5 years being the average age of weaning in this sample (Sugarman & Kendall-Tackett, 1995). In many cultures, co-sleeping may come to an end when the mother has another baby, as mentioned previously. In a number of cases, co-sleeping may continue with the parents beyond infancy, the child may transition to room sharing rather than bed-sharing, or they may transition to sleeping with other family members (e.g. Latz, Wolf, & Lozoff, 1999; LeVine et al., 1994; Welles-Nystrom, 2005). In Western cultures, co-sleeping also may become modified, with some parents placing their infant on a small bed or mattress nearby, but still in the same room. From an AP perspective, such changes in care would only occur if they seemed to be accepted without distress by the developing infant or child. A high degree of responsiveness, particularly to emotions of distress, would likely continue to be a feature of Attachment Parenting.

During the second half year of life, infants exhibit a more distinct and active attachment to their caregivers. In the Western setting, this attachment is typically expressed toward the mother, and, if present, father or other parent. This emerging attachment has a characteristic pattern, at least among Western infants. Rothbaum et al. (2000) discuss how such relationships differ in Japan. The Western parent's goal, according to Rothbaum et al., is to support the child enough so that the child can become more independent. A "healthy" balance between contact or connection to the attachment figure and exploration away from that figure is a central aspect of Ainsworth's theory (e.g. Ainsworth et al., 1978). Developing a healthy balance between exploration and attachment at this point is considered predictive of later more adaptive behavior. This balance is best exemplified by determining whether the infant can use the caregiver as a "secure" base for exploration. The notion of a secure base can easily be operationalized in behavioral terms. Children who will readily explore a new environment when their caregiver is present are said to be using the caregiver as a secure base for their exploration (Ainsworth et al., 1978; Anderson, 1972). Should the caregiver leave or move away, the child's exploring behavior will show a decrease in frequency, and the types of exploration behaviors will change. If the caregiver returns, they will seek contact, either by approaching the caregiver or possibly by indicating that they wish to be picked up. After some period of contact, with a high degree of frequency, they will show a tendency to move away from the caregiver again (Ainsworth et al., 1978). Similar behavior of moving away and moving back near the caregiver is also seen in situations of uncertainty, such as when a stranger approaches.

A parent's behavior when interacting with the infant is considered to be an important determinant of how this balance between attachment and exploration develops. Parents who behave in a sensitive fashion (as originally described by Ainsworth et al., 1978) are more likely to have infants who develop more secure and adaptive attachment and exploration behaviors. Ainsworth et al. used a 9-point rating scale of maternal sensitivity. A maximally sensitive mother "is able to see things from her baby's point of view. She is alert to perceive her baby's signals,

interprets them accurately, and responds appropriately and promptly, unless no response is the most appropriate..." (Ainsworth et al., 1978, p. 142). The least sensitive mother is one who intervenes with the baby entirely according to her own goals, completely ignoring the baby's signals.

To what extent can an AP approach and sensitive parenting be equated? It surely seems as if the two approaches would coincide. We would argue, however, that one could apply AP techniques in a non-sensitive fashion, especially as an infant gets older. This would be especially true if a parent understood AP to consist only of the four behaviors introduced at the beginning, rather than as a general approach to parenting. There are two senses in which continuing to use these behaviors in the same way as with younger infants could represent insensitive parenting. First, a parent who was not sensitive to their older child's new tendency to explore the environment away from the parent, but instead was oriented toward holding the child as much as earlier, might be behaving consistently with a non-developmental and non-sensitive application of AP. Second, there are temperamentally-based individual differences between infants. While these differences exist to some extent in younger infants, they begin to be more pronounced with older infants (Goldsmith et al., 1987, Kagan, 1994, Rothbart & Bates, 1998). Some infants may seek physical contact more than others. Some infants may be more easily consoled than others. Some infants may continue to sleep best with a parent or parents, whereas others may sleep well separately. The more sensitive parent would therefore apply AP practices as appropriate to the child's own preferences and adjust them as possible for the developmental level of the child. Finally, it also should be noted that Ainsworth et al.'s (1978) notion of sensitivity did not require parents to use high degrees of physical contact, co-sleeping and other AP practices. It is possible, although this has not been shown empirically, that infants of parents who use AP practices in a sensitive fashion are more likely to become securely attached (or that is what AP theory would suggest).

There is a great deal of evidence to support the view that continuing to buffer the older infant from stressful events would be what a sensitive caregiver would do (see also Gunnar, 1998), but that this goal might be achieved with some variation from the parenting practices as discussed above. To illustrate how parental behavior might change we will discuss several kinds of child behavior that can be challenging to parents, and what an AP approach might consist of.

Children's Fears: At around the age of two, there is another shift in the kinds of behaviors that the child exhibits.

In Emde's (1998) account, it is around this time that one sees of beginnings of self-reflective awareness. In behavioral terms, children often begin to label themselves in terms of their name, gender and perhaps other characteristics. The child shows what have been called 'moral emotions.' For example, they may become distressed when they violate standards for behavior and they may engage in helping behaviors toward others. This is also a period of time when there are major changes in the child's thinking and problem solving. Piaget (1963) discussed this as the onset of mental representation or the ability to use symbols. In behavioral terms, such representations of the world are seen

in the child's early efforts at pretend play, at drawing, and of course, in the increasing use of more complex language (Sentential stage 5, Commons & Miller, 2007).

Another example of these new representational behaviors is that children of this age begin to exhibit a number of new fears (Craske, 1997; Miller, 1998). Whereas, prior to this general age period, children might cry and avoid situations in which they were immediately fearful (for example, seeing a loud barking dog), they now begin to react fearfully to entities that they imagine (e.g. monsters) or that are not present (crying before going out in anticipation of seeing a loud barking dog). The average number of fears reported by Miller for children between the ages of about two and four, was 11.4; this is comparable to the number of fears reported for children over 4 (for example, by Ollendick et al., 1996). These fears were both of real situations and of imaginary entities. While parents can try their best to avoid situations in which reality based fears will occur (such as avoiding barking dogs), they cannot control their child's imagination. Helping a child to cope with both types of fears can present a challenge to parents, especially for some children, whose fears may be severe enough to meet the diagnostic criterion of being a phobia (e.g. Muris & Merckelbach, 2000).

In reviews of literature about children's fears (e.g. Craske, 1997), it is apparent that little has been written about how parents and young children together and separately cope with the child's fears, especially when these are at a nonclinical level. In Miller's work (1998), three types of coping strategies were discussed by parents: emotional reassurance of the child, which was the most commonly used; explaining something about the feared entity; and/or giving the child some action to perform with respect to the feared entity (such as spraying water under the bed to get rid of the monster). All three strategies were reported by the parents to be successful in that the child was reported to become calmer after parental intervention. According to these same parents, however, the fears in these situations tended to recur for an average of a year's time, so parents' interventions were not of the kind that could convince the child to not be fearful.

How do these reduction strategies fit or not fit with AP? Emotional reassurance is holding the child, soothing him or her in various ways. It seems to be consistent with the AP point of view. But for all three strategies mentioned above, simply being ready to apply them in the situation to reduce the child's emotional distress may be what is most consistent with AP ideas. The intervention should ideally occur a good deal before the full blown fear occurs, so as not to reinforce it, although different parents' tendencies to anticipate children's fears in this way was not explicitly studied in Miller's work. Although rapid and even anticipatory parental intervention would be the most sensitive, it would not be strictly necessary that the intervention used by the parent consist of holding, for example. Some children may be able to be well consoled simply by hearing an explanation or performing an action in response to their fear. In terms of other AP ideas, it has been shown that nighttime fears may be reduced by co-sleeping (Forbes et al., 1992), although other forms of nighttime intervention may also be effective (this has not been explicitly studied). It has surely been an anecdotal observation of these authors that, even for infants and toddlers

who had been successfully trained to sleep in their own beds, there may be a 'return migration' to the parent's bed during this age period. There is little systematic work on what parents do under these circumstances.

Whatever the interventions, studies of children's' anxiety and of 'behavioral inhibition' suggest that fear and anxiety show a high degree of continuity over time. For example, in one study, children who were seen as anxious in the first grade remained anxious in the fifth grade (Ialongo et al., 1995). In a longer term study, Kagan and colleagues (Kagan et al., 2007) found that at least some infants who exhibited inhibited behavior in the face of uncertainty had a tendency to continue to show related behavior through adolescence. This could suggest a strong temperamental and possibly an inherited biologically-based component to these kinds of behaviors, which is not easily overcome by any kind of parenting. There is also some research that suggests a parental contribution to this anxiety and inhibition. Although in these cases it may be difficult to separate the parent's genetic contribution to the child's behavior from the effect of their behavior on the child. For example, Krohne and Hock (1991) found that when parents gave frequent negative feedback to children and attempted to restrict the child's behavior more, that children were more anxious. Barrett et al. (1996) found that parents of children who were anxious tended to interpret ambiguous situations in a threatening way, as did their children; the parents also expected more avoidance from their children. Both of these kinds of strategies seem antithetical to AP, which would be responsive and accepting of the child's fears and seek other ways of coping with them.

Emotion regulation: Emotion regulation consists of the external and internal behavioral processes that occur once an emotion has been activated (Cole, Martin, & Dennis, 2004). Generally, the purpose of emotion regulation behaviors is to reduce the negative effects of emotions. Such negative effects can include external effects. For example, if a young child has a toy taken away by another child, he or she might immediately strike out at the offending child. Such a behavior would show a lack of regulation, and would result in negative social consequences. Parents and teachers, among others, encourage young children to "use their words" when another child takes a toy away, rather than immediately striking out at the other child. The fact that a child can acquire a behavior such as using his or her words in this situation suggests an ability to regulate their emotions. While emotion regulation begins developing in infancy, it continues to develop at least through adolescence, with the preschool period being an important period where such regulation begins to require less input and control from parents (Mischel, Shoda, & Rodriguez, 1989; Rothbart & Bates, 1998).

As discussed previously, helping a child to deal with fear and anxiety is also a case of emotion regulation. When a child is excessively fearful, she may not be able to explore new environments or play with other children. In this case, emotion regulation would consist of learning strategies that would reduce fear and anxiety so that the child could more often participate in school and other environments. In this section, the discussion will focus on how to help children learn to control their emotions so that they do not act aggressively toward others.

Interactions between parents and children, as well as teachers and children are important influences on the development of emotion regulation. A useful model of how regulation and deregulation can develop has been suggested by Scaramella and Leve (2004). This model is called the early child coercion model. That model starts by proposing that a child's temperament influences emotion regulation. The model is to apply especially to the degree of emotional reactivity that the child exhibits. First of all, intense emotional arousal may be more difficult for the child to regulate on his or her own. Second, when children react intensely, parents are more likely to respond with more punitive and rejecting and less sensitive strategies. The harsh parental response has been associated with even more intense arousal in children, and a corresponding increase in difficulty in emotion regulation. This elicits more harsh and insensitive parental behaviors. This cycle is similar to what has been suggested by Patterson and colleagues (e.g. Patterson, Reid & Dishion, 1992), however, it is more specific about the behavioral patterns engaged in by children and parents.

This model of what can go wrong in the context of the development of emotion regulation suggests strategies for interacting with children in these situations that are more in accord with an AP point of view. First, and foremost, a parent would need to anticipate, based on his or her previous experience with the child, how both the child and the parent are likely to react to a situation. This part of an AP strategy for emotion regulation is based on the basic mandate of the parent to be sensitive to the child's signals, and to respond to them quickly. To the extent that a parent can anticipate a child's reaction to a situation he or she can plan ahead so as to avoid an intensely negative reaction. For some children, this may, require a rearrangement of parents' own priorities and plans. To give one example, if a parent knows that a child will be extremely tired and irritable close to dinner time, this is probably not a good time to take that child out to run errands. Parents also may distract a child from an emotionally arousing event (Grolnick, et al., 1998), or provide choices rather than attempting to force a child into a situation. Gardner, Ward and Burton (2003) have shown that parents who are better at helping their children to avoid emotionally arousing situations have children who exhibit better control over their emotions and are easier to deal with.

For the majority of children, such parental anticipation could be relatively easy and effective. There will be times when something cannot be anticipated, and a child, particularly a highly reactive child, becomes intensely distressed in a situation. An AP strategy in this situation is to help the child to reduce his or her distress. Clearly, the strategies of threatening, yelling, punishing the child will have the opposite effect, as noted by Scaramella and Leve (2004). With respect to that individual child, parents will need to develop interactions and situations that will help that child to become calmer. Such strategies might include withdrawal from the over stimulating situation, a toning down of the emotional level of the situation, physical contact between parent and child, or in some cases, an overall reduction of stimulation (as described, for example, in Sacks, 1995, for Temple Grandin).

According to Scaramella and Leve (2004), sensitive parents become less involved in children's emotion regulation as children move from toddlerhood to the preschool years. They allow

the child to try and regulate him or herself and only if that fails do they step in.

◼ CONCLUSIONS

The first benefit of Attachment Parenting is that it helps children become physiologically and psychologically healthy. Attachment Parenting prevents damaging long bouts of crying and mitigates other emotions in response to stressful situations. Being exposed to high levels of stress, especially without close contact with an attachment figure, such as a parent, can have a deleterious effect on the brain that can be irreversible. Such damage results in impaired learning and emotional regulation increasing the likelihood of severe problems in a large percent of children who have experienced it.

A common feature of the Attachment Parenting way of responding to children at these different times in development is that they are directed not only toward attachment but also toward emotion regulation and the reduction of emotions such as fear, anxiety, or anger. Each of these points will be taken up in turn.

By being highly responsive to the child's signals, and particularly by providing and supporting distress relief in infancy and beyond, parents provide a warm and accepting environment for children. Specifically, both the warm, positive tone of interactions and the distress relief, reinforce contact seeking with the parents providing those consequences, and thereby, lead to secure attachment. Alternatively, when parents leave their children alone, especially when the child is distressed, the child learns that the parent cannot be relied upon for relief (that is, they do not learn to turn to their parents when distressed). In both cases, there is evidence (briefly presented above) that such learning generalizes at least to early peer relationships.

There has been confusion in behavioral research on responsiveness to crying, with some arguing that responding to crying would reinforce it and increase its likelihood (e.g. Gewirtz & Boyd, 1977). The Attachment Parenting response to this has two parts. First of all, for the youngest infants, crying is not an operant response. It starts out as a respondent. Crying is the only way they have to communicate that they need something. Such crying is elicited by internal bodily states, such as hunger, and does not tend to occur otherwise. Since the crying is preceded by strong stimulus conditions, the consequence of the parent's response only becomes associated with those stimulus conditions. This should not lead to general 'spoiling.' Second, at this point in the infant's development, parents are still learning about their infant and how to intervene. As parents become more familiar with the infant, they can begin to understand and anticipate the infant's signals better and so can respond to signals that occur prior to outright crying. If crying is only allowed to occur rarely, it is unlikely to become reinforced. As has been discussed, Attachment Parenting practices, both for infants and for older children, do reduce distress, and in most cases do so in an anticipatory fashion.

The second benefit of Attachment Parenting is that is helps the child to become resilient and therefore more independent. Effective emotion regulation is a key aspect of being resilient. We would argue that in each of the cases discussed above par-

ents are helping their child to develop emotion regulation, and therefore, resilience. Early in the child's development the parent is most active in helping him or her to regulate emotions, particularly negative emotions, as practices such as holding, co-sleeping, frequent breast feeding and responsiveness to crying have been shown to do. If a parent engages in these practices in a way that is sensitive to the infant's needs, the infant will most likely develop a secure attachment relationship with that parent. A secure attachment relationship serves as an emotion regulation system as well, but one in which the older infant is more active. When the child becomes distressed or fearful, he or she will seek contact with the parent. When their emotions are under control, they can resume exploring the world. Parents dealing with children's' fears, as well as children who act out, also are working on that child's emotion regulation. To the extent that parents help children to better cope with these disruptive emotions and associated behaviors, the children should be able to engage more with the environment. In effect, they should be increasingly more resilient as they develop. Parents do this (as discussed above) by modeling emotion regulation strategies, by using direct instruction about such strategies, by anticipating and helping the child to anticipate situations which may be difficult for that child, and, when the child fails at emotion regulation, by continuing to provide a warm and responsive context for distress reduction so that ultimately the child will become more successful at emotion regulation.

Again, a misunderstanding can occur that children somehow will continue to be dependent upon their parents for emotion regulation if a parent uses AP practices. A number of studies that have examined this issue have not found this to be true. For example, in families in which the parents have chosen to co-sleep with their infants from the beginning, the children when at preschool age were reported to be more self-reliant and to show greater social independence (Keller & Goldberg, 2004). In that study, these outcomes were indexed by such behaviors as the child being able to dress him or herself, and being able to work out problems with peers on his or her own. In a related study, preschoolers who had been securely attached as infants exhibited significantly less dependence than those who had been insecurely attached as infants (Sroufe, Fox, & Pancake, 1983). Those children with insecure histories had more interactions with teachers, sat next to them more often during circle time and were judged to be more dependent overall. The children with secure histories sought teacher attention in a more positive way and this did not detract from the frequency and quality of their interactions with peers.

While these studies do suggest that using AP practices will not result in increased dependence, they were not able to show directly why this does not happen. It would seem that effective parents are able to both model more mature behavior and - in situations in which the child is not greatly upset-give direct instruction in emotion regulation (as well as reinforcing spontaneously occurring behaviors). As was already discussed above, this seems to lead to the development of more mature behavior (as shown by Gardner, Ward, & Burton, 2003). It may also be true that support in emotion regulation is an important component of relationships with peers, especially beginning in adolescence, and in romantic relationships.

Why is emotion regulation so important? There is considerable evidence that optimal emotion regulation is what makes it possible for children to better engage with the world. Children who regulate their emotions better have more successful peer interactions (e.g. Eisenberg, Fabes, Carlo & Karbon, 1992; Kochanska, Murray & Harlan, 2000). There is ample evidence that young children who have better self-regulation are more socially competent, have fewer problem behaviors, show more 'internalized' control of behavior, and in general, show fewer 'externalizing' behavior problems (e.g., to name just a few studies, Kochanska & Knaack, 2003; Murphy et al. 2004; Olson, Sameroff, Kerr, Lopez & Wellman, 2005). For example, Kochanska and Knaack first tested childrens' self-regulation using a series of behavioral tasks, including amount of time a child was able to delay getting a snack, suppressing or initiating an activity in response to a signal, the extent to which they could slow down a motor activity upon request. Mothers rated the extent of a child's externalizing behavior (from very true or characteristic of the child, to not at all true) using a checklist of 30 behaviors (such as "destroys own or others' belongings" or "fights with other children."). They found that children who showed greater self-regulation (called effortful control in this and other studies) also showed fewer behaviors such as "irritable, quick to fly off the handle", "fights with other children" and other antisocial behaviors. The Olson et al. study used the same behavioral tasks to measure self-regulation, but measured externalizing using the Achenbach Child Behavior Checklist, a much longer list of behaviors (99 items), but that are also rated on a three point scale from "often or very true" to "not at all true." They also found a significant relationship between self-regulation and the externalizing behaviors that were measured. These variables were significantly related even when the researchers controlled for parenting behavior and the degree of family risk.

Most importantly, a culmination of evidence (as discussed in, for example, Blair, 2002; Raver, 2002), has suggested that emotional 'readiness' for school, especially in terms of emotion regulation, is as important if not more important than readiness in terms of specific school-related skills. Emotion regulation, therefore, makes effective engagement with learning situations possible.

One point that needs to be mentioned that has not been extensively addressed is the issue of individual differences. Many parents and others will observe that even though they did not use AP techniques, their children seem to be fine. This criticism can be addressed in a number of ways. First of all, there are significant individual differences between children, as briefly alluded to above in discussions of the work of Suomi (1987; 1991), and Kagan and colleagues (2007). It is for children who are highly reactive that AP will be particularly useful, especially for stress reduction and resilience. For other children, who may be at least overtly less reactive, parents may be able to 'get away with' putting the child to sleep on his or her own, not holding the child very much, and shaping the child much more toward goals such as traditional independence or separateness, that parents may value. What the child may learn, with such socialization, is that human relations are generally ones in which physical and emotional distance between people is expected. In the end, one sleeps alone, and one relies upon oneself for consolation. We

would theorize that being able to tolerate doing this is not the same as being able to flourish. Since most of the research has related more extreme early child rearing situations to more extreme forms of psychopathology, this latter idea is not one that has been empirically investigated.

Generally, the implications for intervention with diverse populations of children seem clear. Both parents and teachers should take the general issues of promoting attachment and emotion regulation more seriously. These issues are just beginning to be studied with different groups of children. A recent study (van Ijzendoorn et al., 2007), for example, has suggested that the parents of a small group of autistic children who were studied were as sensitive as other parents. The autistic children themselves were less likely to be rated as securely attached when compared with other children. The children's behavior was more disorganized and they were less involved with their parents during play. . Van Ijzendoorn and colleagues speculate that neurologically-based deficits may interfere with the effects of parental sensitivity for these children. We would add that the actual nature of what constitutes "sensitive parenting" may be different for an autistic child. .

From the evidence that exists, Attachment Parenting is associated with positive attachment outcomes. It might be particularly useful to teach to parents with attachment issues of their own so that their parenting becomes more adequate.

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Evaluating "Jealousy" in Infants: A Behavior-Analytic Approach

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Abstract

The purpose of this study was to evaluate the negative behaviors emitted by infants during conditions of divided maternal attention from a behavior-analytic perspective. Three infants (21-29 weeks of age) and their mothers participated. Seven conditions were run with the mother-infant dyads (i.e., Control, Neutral Face/Toy, Neutral Face/No Toy, Magazine/Toy, Magazine/No Toy, Doll/Toy, Doll/No Toy). Negative infant behaviors were measured to determine if they occurred more often when mothers did not fully engage with their infants (i.e., engaged in neutral stare, reading a magazine, or talking to a life-like, life-size infant doll) or when infants did not have stimuli with which to engage (i.e., toy). Negative behavior occurred more often in the absence of toys regardless of maternal behavior. This finding suggests that negative behaviors are perhaps more likely accounted for by the lack of interaction rather than infant jealousy.

Keywords

jealousy, maternal attention, infants

I n the field of developmental psychology, it is presumed that children younger than two years of age have not developed self-aware emotions such as jealousy, embarrassment, and shame; however, research suggests that jealousy may actually be present in infants as young as 6 months (Hart & Carrington, 2002; Hart, Carrington, Tronik, & Carroll, 2004; Hart, Field, Del Valle, & Letourneau, 1998). In a study by Hart and Carrington (2002), researchers measured negative infant behaviors (e.g., angry or sad facial expressions), under two conditions: a) mothers interacted with a life-like doll; and b) a control condition in which mothers expressively read a storybook with musical sounds. In neither condition did mothers directly attend to their infants. The results revealed that infant gaze to the mother was closely the same in both the life-like doll and control conditions; however, negative behavior from the infant increased an average of almost 20% in the life-like doll condition relative to control. The authors concluded that the increase of negative behavior towards the social object was due to an early form of jealousy because the life-like doll created a loss of exclusive attention from the infant's primary attachment (Hart & Carrington, 2002). In a similar study conducted by Hart and colleagues (2004), three conditions were run which included mothers attending to a life-like doll (which was hypothesized to evoke jealousy), face-to-face play with their infant, and still-face stare at their infant. Heightened negative behaviors were recorded during conditions when mothers stared at their infants with a still-face and when they engaged with an infant-sized doll. The researchers interpreted these results to support the hypothesis that mother's engagement with an infant-sized doll is as distressing as their lack of engagement with them.

Although the results of these studies reflect increased occurrence of negative behaviors in conditions when mothers attended to the infant-sized doll, each of the studies discounted the effect of the infant's history of reinforcement for negative behav-

ior, as well as how the current environment is affecting infant behavior. Past reinforcers, such as the home environment, other siblings, daily interaction with the primary attachment figure (usually the mother), and sleep/eat schedule can impact infant behaviors in multiple environments (Pelaez & Gewirtz, 1997). Furthermore, a child's behavior is interdependent with the environment (Bijou, 1995). Results from Hart's research may show heightened negative emotions during the jealousy evocation sessions, but it is possible that other variables may account for the negative behaviors observed. Thus, the purpose of this research is to determine if negative behaviors displayed by infants are due to mother's diverted attention to another "infant" or if, indeed, other variables account for the negative behaviors observed.

■ METHOD

PARTICIPANTS AND SETTING

Three infants between 21 to 29 wks of age and their mothers participated in the study. Infants were recruited to the study via a flyer posted in a local daycare. Inclusion criteria were: first born infants, born full-term, and did not have a diagnosed disability. Phone interviews with mothers were conducted in advance of participation in the study to determine eligibility, gain verbal consent, and ask mothers to ensure their infant was fed, changed, and had a good amount of rest before the study. The experiment was conducted in a room approximately seven ft. by seven ft. The room consisted of a high chair for the infant and a chair for the mother. Video recordings were made via an observation window.

RESPONSE MEASUREMENT AND INTEROBSERVER AGREEMENT

Data were collected using a 5-sec partial-interval, paper-pencil system. The following behaviors were measured: negative infant behavior, maternal attention, infant toy engagement, and infant

Table 1. Mean percentage of 5-s intervals with negative behavior, maternal attention, toy engagement and strap manipulation across sessions.

	Sessions						
	1	2	3	4	5	6	7
Negative Behavior	0%	0%	29%	19%	54%	29%	26%
Maternal Attention	0%	0%	0%	32%	14%	33%	33%
Toy Engagement	97%	57%	0%	61%	0%	59%	64%
Strap Manipulation	0%	39%	51%	0%	22%	4.2%	5.6%

high chair strap manipulation (some of the infants had not used a high chair and so the chair and its accoutrements themselves were novel). Operational definitions of negative behavior were obtained from mothers describing their child's negative behavior during the phone interview. Maternal attention was operationally defined as the mother giving physical contact, vocal communication, and/or positive facial expressions to the child. Toy engagement was defined as when the infant engaged in any physical contact with the toy. Strap manipulation was defined as any physical contact with the strap (i.e., hands, mouth).

Interobserver agreement was conducted for 100% of sessions for all participants and calculated by dividing the number of intervals in which both observers agreed on the occurrence of the behavior by the total number of intervals. Mean agreement for negative behavior was 91% (range, 79% to 100%), maternal attention was 98.95% (range, 95.83% to 100%), toy engagement was 96.23% (range, 88.24% to 100%), and strap manipulation was 90.55% (range, 83.3% to 100%).

DESIGN AND PROCEDURE

The experiment utilized a single-subject, multi-element design. Seven conditions were presented in random order and each infant experienced each condition once. Each session was 2-min long with a 1-min break between each session. The sessions were as follows:

- Control: mother gave complete attention to her infant and interacted with the infant who also had access to many different toys.
- Neutral Face/Novel Toy: mother had a neutral facial expression and the infant was given a novel toy.
- Neutral Face/No Toy: mother had a neutral facial expression but the infant did not have access to a toy.
- Magazine/Toy: mother read a magazine and did not attend to her infant but the infant had access to a novel toy.
- Magazine/No Toy: mother read a magazine and did not attend to her infant and the infant did not have access to a toy.
- Doll/Toy: mother attended to a life-like doll while not attending to her infant but the infant had access to a novel toy.
- Doll/No Toy: mother attended to a life-like infant doll while not attending to her infant and the infant did not have access to a toy.

■ RESULTS

Figure 1 presents mean percentage of 5-s intervals in which infants engaged in negative behavior relative to the delivery of maternal attention, toy engagement, and strap interaction. The highest percentages of intervals with negative behavior were observed in the following conditions: Neutral Face/No Toy (54%); Magazine/No Toy (46%); and Doll/No Toy (44%). When toy interaction was the highest (Control; Neutral/Toy; Magazine/Toy; Doll/Toy), the percentage of intervals with negative behavior was the lowest ranging from 0% to 4%. When toy interaction was the lowest (Neutral Face/No Toy; Magazine/No Toy; Doll/No Toy), the percentage of intervals with negative behaviors was the highest, ranging from 36% to 63%. The conditions that had the highest percentage of intervals of strap manipulation (Magazine/No Toy, 39%; Doll/No Toy, 29%) were also conditions with relatively high percentage of intervals with negative behavior (Magazine/No Toy, 36%; Doll/No Toy, 47%).

To determine if negative behaviors were a result of the duration of time spent in the high chair, we evaluated the data for all variables measured across time. An analysis of these data show that infants were more likely to show distress towards the end of the research period than the beginning, however, this was not a continuous and steady increase (See Table 1).

■ DISCUSSION

This study sought to determine if negative behaviors displayed by infants were indeed due to a mother's divided attention to another infant, which others have interpreted as evidence of jealousy (e.g., Hart et al., 2004), or if other environmental variables could account for this observation. This study replicated some earlier findings. Specifically, when mother's attention was withheld, infants demonstrated increased negative behavior or, in other words, became distressed. Furthermore, infant distress was greater when mothers were attending to another "infant" rather than when mothers were engaged in an alternate activity (i.e., reading a magazine). However, contrary to Hart and Carrington (2002), we found that negative infant behaviors occurred less often in the "Doll/No Toy" condition than the "Neutral Face/No Toy" condition. Additionally, upon further data analysis, it was apparent that negative behavior decreased when infants had access to toys, seemingly independent of their mother's behavior. This observation brings into question the interpretation of previous research findings.

Although previous research has suggested that jealousy is present at six months of age, none of the previous research manipulated additional variables that might influence infant be-
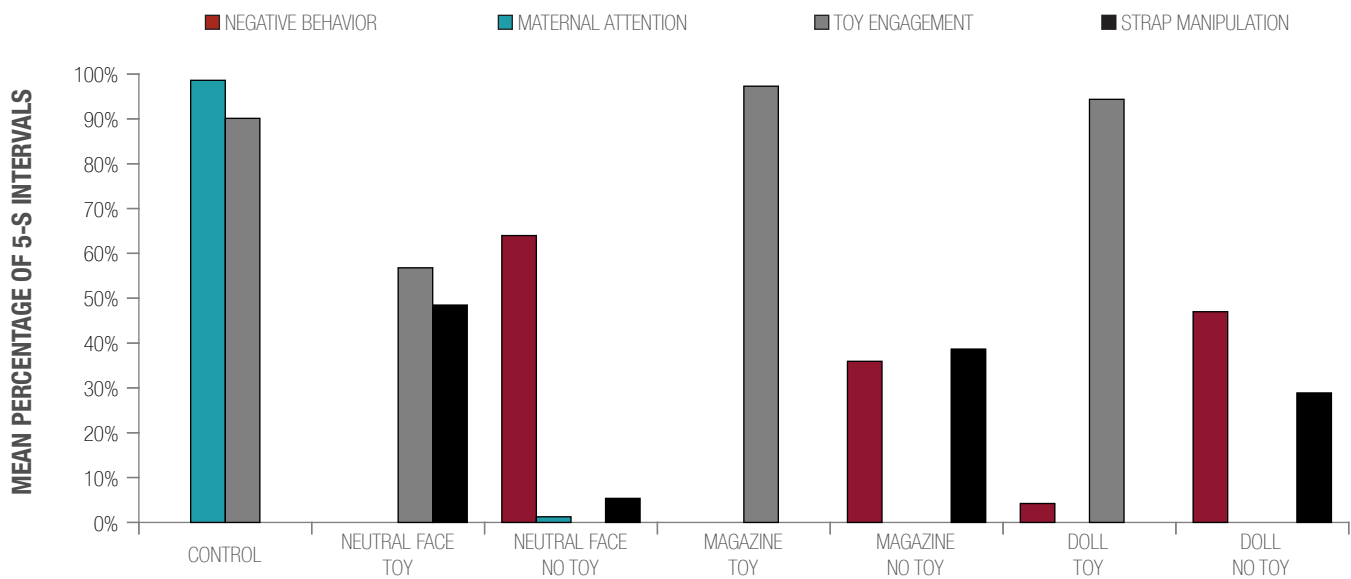
Figure 1. Mean percentage of 5-s intervals with negative behavior, maternal attention, toy engagement, and strap manipulation within each condition.

havior. As we know, behavior is under the control of various contingencies. Our interpretation of these data is that infants are not necessarily protesting divided maternal attention but may instead be manding interaction. The interaction can be with their mothers, or, as we saw in this study, can be with inanimate objects.

Admittedly, there were limitations to this study. For example, the high chair was novel for two of the infants, and this unfamiliarity may have contributed to increased negative behavior, as increased strap manipulation was observed in the presence of negative behavior (see Figure 1). Another limitation is that we did not provide infants with the means by which to mand interaction. In an earlier pilot study, conditions in which mothers delivered attention contingent upon negative behaviors (within the Magazine/Toy, Magazine/No Toy, Doll/Toy, Doll/No Toy conditions) were also conducted; however, session analysis revealed that negative behaviors increased as participation duration increased suggesting that the negative behaviors observed were perhaps a function of the length of participation in the study rather than the contingencies in effect. Establishing a way for the infants to mand maternal attention would facilitate clearer interpretation of infant responses.

Alternate explanations may also be provided for our results. For example it is possible that infants were distracted by the toy and impervious to their mother's interaction with the life-like infant doll. However, if that were the case we would have anticipated seeing zero occurrences of negative behavior in any condition in which there was a toy available. Instead, we observed negative behaviors in the Doll/Toy condition. Despite the limitations, this research provides an alternate interpretation of the negative behavior displayed by infants than current explanations. Future research should be conducted to further evaluate if infants this young are indeed manding interaction rather than expressing distress over maternal divided attention.

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Effects of a Treatment Package on the On Task Behavior of a Kindergartener with Autism Across Settings

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Abstract

The inclusion of students with autism and other special needs into the general education setting has been an increasingly difficult task for schools both in and out of the United States. Although there is debate as to the appropriateness of this practice, the trend to include is increasing. Many students are observed to have behaviors that are "off task", meaning that they interfere with their own learning and in some cases, the learning of others. Off task behaviors may include stereotypy and must be reduced or replaced so that students are successful in school. Our treatment package included textual prompts, learn units, and contingent corrections to increase on task behaviors during one to one and group instruction in a general education setting. Overall, we observed educationally significant gains in on task behavior subsequent to the introduction of the treatment package in a kindergartener with autism across three school settings. A multiple baseline across settings experimental design was used in the present study. The present study represents the first educational application of a single case experimental design in the region. Maintenance of the behavior change was assessed through a probe session two weeks after the treatment package was removed. Limitations of the study are discussed.

Keywords

textual prompts, learn units, on task behavior, stereotypy, autism

T he inclusion of students with autism and other behavior disorders into the general education setting has been a controversial practice for many years (Repp, 1996; Stainback & Stainback, 1995). The arguments surrounding inclusion of students with special needs have been polarized, with some strongly opposing inclusion of any type and some in favor of inclusion for all students. Some who oppose inclusion may be the parents of typically developing children who fail to see the benefits for their children. Conversely, there are those advocates, special educators, and administrators who favor inclusive education for all students. They have been criticized for ignoring the individualized needs of the student with special needs. The field of special education has fought to advocate for students over the years and some of its constituents want to preserve the self-contained classroom model for those students who might be more appropriately educated separate from their peers and, in fact, the law provides for this (Wright & Wright, 1999). Outside of the United States, such as in Hong Kong, these issues are exacerbated by cultural challenges and programmatic factors, such as limited resources available to teachers and families (Wong & Hui, 2008).

Some of the critics of inclusion in any form would argue that the inappropriate behaviors that are observed for many children with special needs (i.e. disruptive, aggressive, stereotypic) affect the general education students in adverse ways such as by mod-

eling inappropriate behavior or monopolizing the teacher's attention. However, this is rarely the case. On the contrary, there is significant evidence of the benefits to students with and without special needs that result from inclusive classrooms (Feldman, 2002; Rea, McLaughlin, & Walther-Thomas, 2001).

Consequently, schools and Individualized Education Program (IEP) teams are increasingly confronted with the problem of treating the inappropriate behaviors of students so that they can successfully participate in the general education curriculum. The increase of on task behavior (i.e. attending and correct academic responding) as well as the reduction or replacement of off task behaviors (i.e. stereotypic behaviors) is necessary for students to succeed due to fact that the inappropriate behaviors are often incompatible with on task and appropriate academic and social responding.

Stereotypy has been defined as, "stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, complex whole-body movements) by the American Psychiatric Association (APA, DSM-IV-TR, 2000). Rapp & Vollmer (2005) provided a description of stereotypy from a neurobiological source (i.e. sensory or automatic reinforcement) as well as a review of the medical treatments that have shown some reduction in these behaviors.

Greer, Becker, Saxe, & Mirabella (1985) defined stereotypy as cycles of repetitive movements that have no apparent consequences for the individual who is emitting the responses beyond the movement itself. In the same study, five students with developmental disabilities were taught to choose toys instead of

engaging in stereotypy behaviors in their free time. Nuzzolo-Gomez, Leonard, Ortiz, Rivera, & Greer, (2002) successfully replicated the earlier Greer et al. (1985) study with four students with autism. After a conditioning (pairing) procedure using books and toys, the students were more likely to engage in appropriate looking at books or toy play and were observed to be less likely to have stereotypy behaviors. Both of these studies showed effective replacement skills, however, both were conducted during *free time* settings.

Other research has shown that there are effective tactics to increase "on task" academic behaviors involving self-management (Callahan & Rademacher, 1999; Stahmer & Schreibman, 1992), the reduction of inappropriate behavior (Tasky, Rudrud, Schulze, & Rapp, 2008; Machlicek, O'Reilly, Beretvas, Sigafoos, & Lancioni, 2007), and improvements in verbal behavior and reducing palalalia behaviors in children with autism and behavior disorders (Greer & Ross, 2008; Karmali, Greer, Nuzzolo-Gomez, Ross, & Valdes, 2005; Mancina, Tankersley, Kamps, Kravits, & Parrett, 2000).

Conroy, Asmus, Sellers, & Ladwig (2005) successfully taught a six-year-old boy to discriminate times in the day at school where stereotypic behaviors were acceptable and not acceptable using an antecedent based intervention involving visual cue-cards. The procedure was then successfully generalized to the teacher's assistant. This procedure was effective in helping one student with autism to discriminate the times where it was acceptable to have stereotypic behavior (i.e. not in math class). The advantage of this technique was that it was reasonable to expect the teacher of the class to be able to generalize the procedure and it was successfully applied in a general education setting.

In a research paper by Greer & Bruno (1997), a textual prompt procedure was found to be more effective when compared to a verbal prompt procedure in the treatment of echolalia behavior in a student with autism (Greer & Ross, 2008). Social Cue cards were found to be beneficial in another study using preschoolers with autism spectrum disorders (Caballero & Connell, 2010). Textual prompts as an antecedent based strategy can be used successfully to increase the on task behavior of children with special needs in school.

In the present study, we report on the effects of a treatment package on the on task behavior of a kindergartener across three school settings. The treatment package consisted of textual prompts, learn units, and contingent corrections. The three school settings were: a self-contained classroom, a general education classroom, and a physical education class. Since the student was observed in baseline conditions to be on task a majority of the time in all three settings, the treatment was applied to on task behavior viewed as a performance task rather than an acquisition task. It might be predicted, in that case, that smaller gains may be observed since we aimed at improving behaviors already observed to be in the student's repertoire. Subsequent to the treatment condition, a single probe session was conducted two weeks afterwards to test for maintenance of the behavior change. Notable is that the student was enrolled in an inclusive school environment in the Hong Kong Special Administrative Region (HKSAR).

■ PROCEDURE

EXPERIMENTAL DESIGN

The present study used a single case experimental design. A multiple baseline design across school settings was applied with a post treatment probe. Baseline data were initially collected across three school settings. The treatment package was systematically applied to the behaviors in the settings that were the most stable, and was subsequently applied to other settings based on the steady state strategy (Johnston & Pennypacker, 1993).

STUDENT AND SETTING

The student, KL, was 6 years old, participated in the study. The student was diagnosed with autism prior to his attending the school program by an independent clinical psychologist based on the criteria set forth in the DSM IV-TR (APA, 2000). KL had been enrolled in The Children's Institute of Hong Kong (TCI) full time for about two years at the time of the present study. TCI was established as a non-profit school in 2003 as the first school set up solely for the purpose of educating students with autism and to use Applied Behavior Analysis (ABA) in HK-SAR. TCI delivers one to one special instruction using ABA, Verbal Behavior Analysis (Greer & Ross, 2008), learn units (Albers & Greer, 1991; Greer & McDonough, 1999; Greer, 2002), daily graphing and data decision analysis, teacher training, and Board Certified Behavior Analysts conduct frequent Teacher Performance Rate Accuracy observations on teachers (TPRA, Ingham & Greer, 1992). The program was located along side of a primary and international school called The Harbour School (THS) that provides inclusion opportunities to TCI students, when appropriate.

KL's verbal milestones included speaker and listener behaviors as well as emerging reader and writer responses (Greer & Ross, 2008). He was observed to be able to read and write albeit below grade level by about one year. An independent literacy assessment was conducted by the Learning Support Team at The Harbour School using the DIBELS® (Dynamic Indicators of Basic Early Literacy Skills, 2009) to determine literacy levels.

Prior to the study, KL had spent a majority of his time receiving one to one special instruction using ABA in the TCI self-contained classroom. At the start of the school year when this study began, KL's IEP team decided to include KL into a kindergarten class for about half of each day with his one to one teacher for support. This decision was based, in part, on KL's performance on a screening instrument used by TCI to determine inclusion eligibility called the Checklist for Inclusion Class Screening (CLICS).

The IEP team was able to customize a weekly schedule for KL that consisted of about half of each day in the TCI self-contained classroom where KL could receive individualized learn unit instruction with one of two teachers. During the other half of his day, KL participated in a kindergarten and primary 1 (P1) class of about 16 students with one head teacher and two teacher assistants. When KL would go to the P1 class, his teacher would go with him to "shadow" and facilitate his participation in academic subjects such as literacy and numeracy, lunch, playtime, and physical education (PE). The intervention took place in the

TCI one to one classroom, the P1 classroom, and in the PE environment which was either in the school's playground area, or in a gymnasium. Fewer sessions were observed in the PE condition due to the fact that PE was only scheduled to occur twice a week while participation in the other settings was daily (Monday through Friday).

The two teachers assigned to work with KL alternated days. Each had completed undergraduate degrees in education and psychology and had at least one year of supervised experience working with young children with special needs. Each had also completed about 15 hours of applied behavior analysis formal instruction by a doctoral level Board Certified Behavior Analyst. Regular supervision and TPRA observations included written feedback. The TPRA observations included interobserver agreement measures to calibrate the data collection procedures of the teachers and the delivery of in-tact learn units. Learn unit rates were also measured through the TPRA procedure and occurred in a range of 3 – 6 correct learn units per minute or higher.

MATERIALS

The student's on task behavior consisted of attending to group instruction, various verbal behavior responses (i.e. listener behavior, intraverbals), academic, and social skill programs during the present study. Age-appropriate instructional materials such as math worksheets, phonic reading materials, toys, games, pens, data sheets, and classroom furniture was present during the conditions. In the PE condition, which generally took place in a playground or gymnasium, various gym equipment such as soccer balls were used.

Due to the nature of the data collection procedure, a special timer that would vibrate on programmed intervals (i.e. 10 seconds or 2 minutes) was used. For this purpose, the Invisible Clock II® (Time Now Inc., 2004) served as a precise and invaluable timing device for both of the teachers who implemented the intervention, and the researchers who observed and recorded the data on the student's on task responses.

The textual stimuli were small sentence strips with black print on regular white office paper. The sentence strips were about 5 cm long by 1 cm wide and were laminated for durability. The strips were used as both prompts and corrections throughout the treatment condition. The strips would read "Look at the *Teacher*", "Hands Down", "Be Quiet", or "Listen to *Teacher*". The actual teacher's name was printed on the sentence strip. For example:

Look at Ms. Lee		Hands Down

■ DEFINITIONS OF BEHAVIOR

There was one response class observed throughout the study, on task behaviors. On task behaviors included appropriate affect and attending skills, social responses, verbal behaviors, and correct academic responses to teacher presented learn units (Albers & Greer, 1991; Greer & McDonough, 1999; Greer, 2002). Learn units were presented by the TCI teachers and/or the K/P1 THS teacher in the classes or the PE teacher. The student needed to be looking, oriented towards, appearing to listen, or responding to the learn units presented by the teacher for the instruction to be observed to be "on task". The student also needed to be responding to or attempting to respond to instructional directions and teacher generated antecedents (learn units).

On task also was defined as an absence of the following responses: stereotypic behaviors such as rubbing hands together, clapping, hand flapping, rocking, body posturing, toe walking, rubbing his chin with his hand, tensing, and staring up or away from the teacher or instructional materials. Stereotypic behaviors were targeted because they interfered with the student's responding in both one to one and group instructional environments. If the student was not observed to be on task, but did not engage in stereotypy, the behavior was recorded as off task.

DATA COLLECTION

Data were collected on one response class, on task behaviors. The data were collected using the whole interval recording procedure (Cooper, Heron, & Heward 2007). Intervals were set at 10 seconds. One observational period was defined as one 10-minute session using direct observation and recording in real time. The observational periods occurred on successive days. During the observational sessions using whole interval recording, if on task behaviors were observed across the entire 10 second interval, a "+" was recorded on a data sheet with 60 boxes. If any of the stereotypic behaviors were observed, for one second or more within any given 10 second interval, a "-" was recorded on the data sheet. If there was no on task behavior observed, and no stereotypy observed in any given 10 second interval, a "-" was recorded on the data sheet. After each observational session, the number of on task intervals (+) were added and divided by 60, then multiplied by 100. The resulting number (percentage) was graphed on a percentage graph for each setting, respectively.

All data were collected by any one of the three authors of the study as well as the two teachers who worked with KL one to one. About 30% of the observation sessions, interobserver agreement was calculated. Interobserver agreement is reported below.

BASELINE CONDITION

In the baseline condition of P1 there were few learn units occurring due to the nature of large group instruction (i.e. fewer than one every five minutes). The consequence for stereotypy during the baseline condition across all settings was a simple correction procedure, described below. In the TCI setting, there was one to one instruction occurring where the student would receiving learn units across verbal behavior, academic, and social skill programs. The baseline condition in the PE setting was similar to that of the P1 setting in that there were few opportunities to respond.

TREATMENT PACKAGE

During the treatment condition of the experiment, the treatment package was implemented across all settings. Learn units between the teacher and student were presented every two minutes. Learn units are interlocking three-term-contingency trials between the student and the teacher (Albers & Greer, 1991; Greer & McDonough, 1999; Greer, 2002; Greer & Ross, 2008). The treatment provided a significant increase in the opportunity to respond in both group settings (i.e. P1 and PE) but did not

Table 1. Summary of results from the multiple baseline across three settings

	Baseline	Treatment	Probe
Setting 1 (P1 Group)			
Number of instructional sessions	14	9	1
Mean on task behavior	44%	67%	(63%)
Range	(0%, 70%)	(35%, 87%)	–
Difference in range	70%	52%	–
Difference between conditions	–	23%	–
Setting 2 (TCI 1:1)			
Number of instructional sessions	17	15	1
Mean on task behavior	76%	79%	(93%)
Range	(52%, 95%)	(60%, 92%)	–
Difference in range	43%	32%	–
Difference between conditions	–	3%	–
Setting 3 (PE Group)			
Number of instructional sessions	10	6	1
Mean on task behavior	37%	70%	(78%)
Range	(12%, 60%)	(62%, 92%)	–
Difference in range	48%	30%	–
Difference between conditions	–	33%	–

add a significant number of additional learn units to the TCI one to one setting since there were already learn units occurring at a fast rate (i.e. three learn units or more per minute). The Invisible Clock II® worn by the one to one teacher, would vibrate every two minutes, the teacher working with KL would show him a sentence strip that was aimed at prompting his attending (i.e. looking, listening, and orienting his head and eyes towards the teacher presenting the lesson or to the instructional materials).

Textual prompts were applied as antecedents to learn units and as corrections for stereotypy and other off task behaviors. Positive reinforcement for correct responding to the teacher was provided consistently for on task responses on an FR1 schedule of reinforcement. Reinforcement was delivered in the form of social praise that included verbal praise (i.e. "keep up the great work", "Excellent looking at the teacher", "Nice following directions") or nonverbal praise (i.e. pats on the back, smiles).

The consequences for off task behavior throughout the study was the simple correction. Corrections were provided immediately after and contingent on incorrect responses in the baseline setting. In the TCI condition, the immediate presentation of additional learn units followed the correction procedure. Sentence strips were used as corrections and would read "Hands down", or "Be quiet". These served as corrections because they functioned to prompt his on task and correct attending behavior.

One advantage of the sentence strips, and the rationale for using them in the general education classroom, was that they were non-intrusive and discrete. Discretion of the intervention was a major factor in the group settings where general education students were in close quarters. A brief assessment was conducted prior the treatment condition to establish that the prerequisite behavior (reading) was in the student's repertoire. The teachers observed that the student could read and reliably follow the written instructions on the sentence strips.

INTEROBSERVER AGREEMENT

Interobserver agreement was calculated using the formula: agreements divided by agreements plus disagreements multiplied by 100 as described by Cooper, Heron, & Heward (2007). There were 30% of the total sessions observed with interobserver agreement. In setting 1 (P1 Group) the mean was 90% with a range of (72%, 98%) across five observations. In setting 2 (TCI 1:1) the mean was 92% with a range of (87%, 100%) across 10 sessions. In setting 3 (PE Group) there was an interobserver agreement mean of 91% with a range of (42%, 98%) across 8 sessions.

■ RESULTS

The first intervention was conducted in a Primary (P1) mainstream classroom. There were 14 sessions of baseline data collected. The percentage of on task appropriate behavior was ranged between 0% and 70%, and the mean was 44%. The trend was highly variable and the data were low. In the treatment condition, a total of 9 sessions were observed. The percentage of appropriate behavior increased to 67% on average and ranged from 35% to 87%. There was an educationally significant 23 % increase in on task and appropriate behavior after the treatment package had been implemented. Figures 1 and 2 show visual graphic displays of the data.

The second intervention was conducted in the TCI classroom during one to one instructional learn unit sessions. Baseline data was taken for 17 sessions and the result was variable with
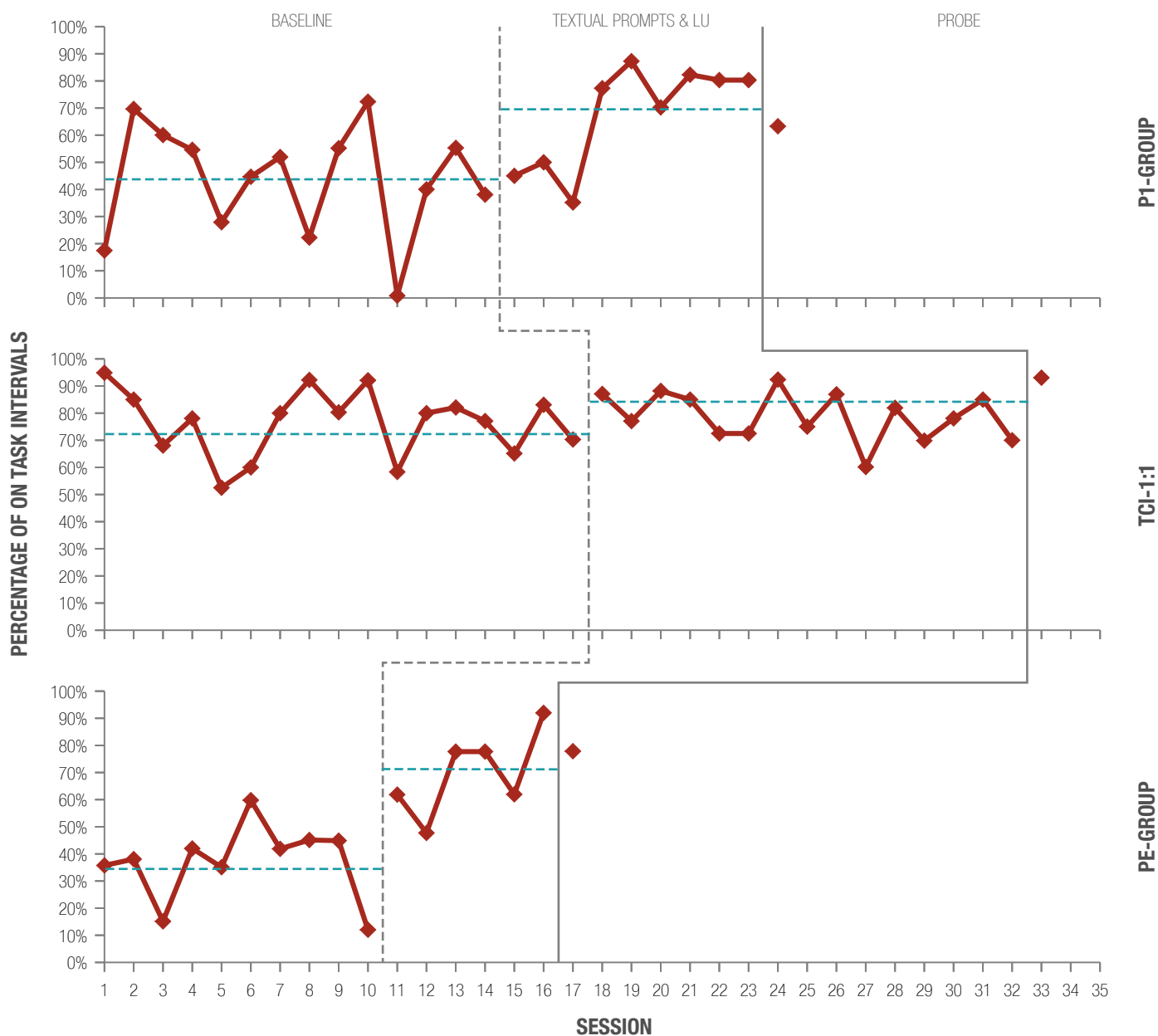
Figure 1. Percentage of on task behaviors of KL across three settings for three conditions: baseline, treatment condition, and post-treatment probe with mean level lines

a slightly descending trend. The range was from 52% to 95%, averaging 76%. Follow up with the 15 treatment sessions, the data showed a stable and slightly descending trend. The mean was slightly above the baseline level at 79%, and ranged between 60% and 92%. On task behavior was increased 3% from baseline to treatment, a modest increase, but improvement was observed as a performance task

The intervention was applied to the third setting during the group PE lesson. The data collected from the 10 baseline sessions resulted in a highly variable trend with high rates of stereotypy observed. The range was 12% to 60%, averaging 37%. During the 6 sessions of treatment, the average on task interval had increased to 70%, and ranged from 62% to 92%. An increase in on task behavior of 33% resulted from the intervention. The change in on task behavior was greatest in this PE condition.

Post-treatment probe sessions were conducted across each of the three experimental settings. On task probe data in the PE condition was 63%, in the TCI settings was 93%, and in the P1 setting was 78%, respectively. Probe were conducted two weeks after the intervention condition. On task behaviors were observed to be higher than that of the mean in the treatment condition for all condition with the exception of in PE.

The data show an educationally significant increase in all three conditions as a function of the treatment package. The on task behaviors increased the most in the PE condition and they increased the least during the TCI setting. There was an observed decrease in the variability in the on task behaviors was reduced in all of the three settings after the treatment package had been introduced. The results of the three different settings are summarized in Table 1.

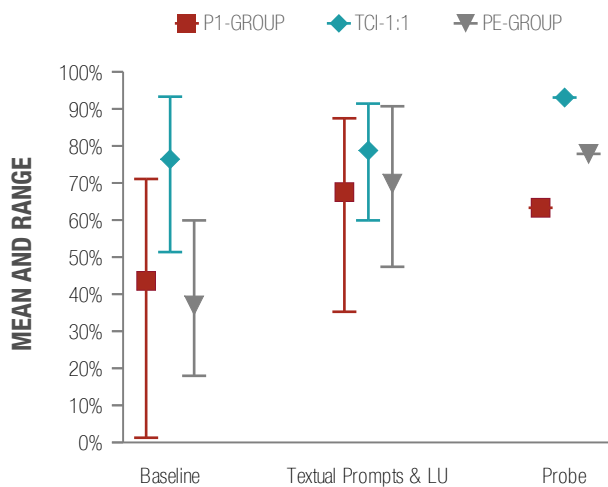*Figure 2.* Data on mean and range of on task behavior for KL across three settings and three conditions: baseline, treatment, and post-treatment probe

■ DISCUSSION

The results show that on task behaviors were increased through the application of the treatment package. These effects were maintained at least two weeks after the termination of the intervention. Results were educational significant for two reasons. First, KL's on task behaviors were increased and therefore he was off task and doing stereotypy less of the time. On task behaviors were directly measured. Second, the results were educationally significant due to the collateral benefit to KL. Those benefits include KL's correct responding to group instruction in the general education setting. Target behaviors were tied to the general education curriculum in the THS K/P1 class. KL was learning with his peers in the least restrictive environment. The collateral benefits such as number of correct responses to learn units or educational (IEP) objectives met were not measured directly, although they could be measured through future research.

In the Conroy et al. (2005) study, the researchers successfully taught one 6-year old boy with special needs to discriminate where it was appropriate to engage in stereotypic behaviors (i.e. not in math class). Our results expand on their findings and demonstrate that on task behavior can be shaped across multiple instructional settings using the same intervention. Another important aspect of both studies is that the treatment package was implemented in a relatively discrete manner in a general education classroom without distracting other students. The probe session has shown that it is likely that the behavior change will occur over time.

This satisfies an important aspect of the generality of behavior change as described in the seminal article, Some Current Dimensions of Applied Behavior Analysis by Baer, Wolf, & Risley (1968).

The positive outcome was especially pronounced in the PE Group condition where a 33% increase in on task behavior was observed. This is likely due to PE having the fewest or slowest rate of naturally occurring learn units. Future research can count the learn units occurring across settings to make a more accurate comparison. Post-treatment probes showed that behavior change levels were maintained after the treatment package was removed for at least two weeks.

The trend of the data in the self-contained classroom setting, TCI, did not appear to be improved as much as the other group settings, however, the variability was reduced in all settings (see Figure 2). We argue that the increased number of opportunities to respond (learn units) that was characteristic of the TCI one to one instructional format was responsible for the observed higher rate of on task behavior in the baseline condition. Therefore, there was less downtime and significantly more opportunities for reinforcement of appropriate on-task behaviors in the TCI setting as compared to the P1 and PE general education group settings. Since the level of the baseline data was already relatively high in this setting (Mean=72%), the room for improvement was limited and the change was not as dramatic as in the other settings.

There are many studies in the research literature that have treated off task behavior as such as stereotypy (Ahrens, Lerman, Kodak, Worsdell, & Keegan, 2011; Callahan & Rademacher, 1999; Greer & Ross, 2008; Karmali, Greer, Nuzzolo-Gomez, Ross, & Valdes, 2005; Mancina, Tankersley, Kamps, Kravits, & Parrett, 2000; Stahmer & Schreibman, 1992) and improved on task behavior (Tasky, Rudrud, Schulze, & Rapp, 2008; Machlicek, O'Reilly, Beretvas, Sigafoos, & Lancioni, 2007). The intervention that was applied in our study joins those that are free from medical prescriptions or punative contingencies, both of which carry a significant risk of undesirable side effects.

To date, few have applied treatments in situ to students with special needs while attending general education classes. Even fewer have applied behavior analytic techniques in inclusive schools environments outside of the United States. We expect that this will change slowly but surely as the field and its affiliated chapters expand to all continents and countries.

LIMITATIONS OF STUDY

The variability of the data could be attributed to a number of confounding variables within the settings. In future studies, we suggest that data collection be carried out only under the same conditions in each setting to improve on the internal validity. For example, the time of day, instructional lesson or activity, materials used, and teacher could have been controlled for. KL had two TCI teachers who rotated daily. The experimenters assessed treatment integrity during the observation sessions, but there were no controls for which of the two teachers worked with the student throughout the study. Slight inconsistencies between the teachers might be one of the factors that had influenced the outcome measures. These effects might have been compounded in the TCI condition. TPRA observations prior to this study confirmed that each teacher could successfully present learn units, however, procedural drift could have affected the learn unit presentation through the duration of this research.

Additional research should compare the use of various techniques to improve students' with special needs on task behaviors in the general education setting. Other populations of student with special needs but not autism, per se, should be exposed to various treatments in the mainstream. Furthermore, inclusive school communities could communicate about which treatments for inclusion are most effective and ensure that those behavior changes can be generalized to other environments.

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Positive Behavior Support: Analysis of Consistency Between Office Discipline Referrals and Teacher Recordings of Disruptive Classroom Behaviors

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Abstract

This study investigated the representativeness of office discipline referrals for disruptive classroom behaviors within a positive behavior support implementation over 17 weeks. In-class reporting and office discipline referrals were gathered across three schools. Twelve teachers took in-class data on 20 students receiving secondary- or tertiary-level interventions in School 1. Ten teachers took in-class data on 14 students receiving secondary- or tertiary-level interventions in School 2. Eight teachers took in-class data on 11 students receiving secondary- or tertiary-level interventions in School 3. Results of this study indicated that office discipline referrals were not representative of teacher recordings of classroom behavior. Implications and areas of future research will be discussed.

Keywords

Office disciplinary referrals, in-class behavior, positive behavior support, three-tier model, primary-level intervention, secondary-level intervention, tertiary-level intervention

Schools need to be safe environments where students can learn the necessary skills to be contributing members of society. Unfortunately, many schools are facing students who challenge traditional reactive discipline models and jeopardize safety in schools. For example, in 2006 approximately 6% of students aged 12 to 18 years said they were afraid of being harmed at school, and 86% of public schools reported incidents of crime (National Center for Education Statistics, 2007). The ability of educators to provide instruction and permit a safe learning environment is significantly impaired by those students who engage in violent, disruptive, defiant, and dangerous behaviors (Crone & Horner, 2003).

One way to address traditional behavior problems in our schools is through the implementation of a proactive model called school-wide Positive Behavior Support (PBS). PBS has as its foundation, applied behavior analysis (Johnston, Foxx, Jacobson, Green, & Mulick, 2006). According to Sugai et al. (2000), "PBS is a general term that refers to the application of positive behavioral interventions and systems to achieve socially important behavior change" (p. 133). PBS is a combination of behavioral science, practical interventions, social values, and a systems perspective. In this model, the assumption of behavioral science is that human behavior is learned and can be controlled through manipulating the environment to produce positive outcomes. Further, practical interventions with ongoing data collection and analysis to inform decisions are emphasized. PBS addresses social values by ensuring that behavior change is socially significant. Finally, a systems perspective is emphasized that addresses all contexts of the school (e.g., school-wide, classroom, common non-classroom specific areas, and individual students).

School-wide PBS includes three levels or tiers of systematic prevention of behavior problems: primary, secondary, and tertiary (Walker et al., 1996). In this three-tier model, primary-level programs target all students with universal interventions that teach a clear set of positive expectations across all school environments. Typically, three to five broad expectations are taught (e.g., be safe, be respectful, be kind). "Research strongly suggests that 80 to 90 percent of children respond well to simple, school-wide discipline policies that emphasize good behavior" (Cortese, 2007, p. 7). By maximizing student academic and social success, designing and presenting effective and interesting instruction, and teaching school success skills, schools can establish primary-level programs that have the greatest possible impact on our schools (Walker et al., 1996).

Secondary-level interventions target 5% to 15% of students who are at risk for problem behavior (Crone & Horner, 2003). Secondary-level interventions are targeted to students who have not benefited from primary programs. These interventions may include focused small group instruction in social skills for students with poor or inappropriate peer or adult interactions. Specific secondary-level interventions include social skills clubs and check in/check out systems (Office of Special Education Programs, 2007).

Tertiary-level interventions focus attention on 1% to 7% of students who exhibit chronic and intense problem behaviors (Crone & Horner, 2003). These interventions target students with severe

behavior problems who did not benefit from primary-level programs or secondary-level interventions. These students require intensive and individual specialized services. A behavior support team develops a behavior support plan for these students. Tertiary-level interventions include individualized self-management training, contingency management strategies, and one-on-one tutoring. Most students at this level require wraparound services involving community members, parents, and other specialists.

It has been reported that one way to help identify students across each of the three tiers is through the use of the *School Wide Information System* (*SWIS*) (Irvin et al., 2006). *SWIS* is a web-based data system that uses information from office discipline referral (ODR) forms including the student's name, referring teacher, time of day, and location of the problem behavior. The school can use ODR data from *SWIS* to determine when and where specific student behaviors occur. In turn, they can use this information as a tool to improve school discipline practices, support planning of interventions, and report discipline data to the district or state.

Although *SWIS* provides an opportunity to identify students with behavior problems, the appropriate data must first be input. Schools need a method of obtaining valid data concerning student behavior, school and classroom climate, and the overall effectiveness of PBS intervention programs. Schools across the nation commonly use office discipline referrals (ODRs) to obtain these data (Irvin, Tobin, Sprague, Sugai, & Vincent, 2004). For example, Gottfredson (2001) found that ODRs were used 79% of the time as an outcome measure to evaluate school-wide discipline programs. Benefits of such a system include its ease of implementation: collecting, managing, and tracking data to formulate a comparative index of student behavior is much simpler than in other models (e.g., observation). Further, Tidwell, Flannery, and Lewis-Palmer (2003) noted that office discipline referral data could be a useful tool for making decisions about assessment needs, program planning, staff development, and program evaluation.

Researchers have reported that ODRs are useful data for classroom teachers to screening for behavioral difficulties, monitor behavioral progress, and evaluating classroom behavioral interventions. Rusby, Taylor, and Foster (2007) found that ODRs in kindergarten and first grade predicted classroom teacher ratings on the *Child and Adolescent Disruptive Behavior Inventory* (*CADBI* version 2.3; Burns, Taylor, & Rusby, 2001) and parent ratings of disruptive behavior on the same measure at the end of kindergarten and first grade. Evidence for the predictive validity of ODRs in elementary classroom settings was also found by Walker, Cheney, Stage, and Blum (2005). These researchers found that students with two or more ODRs (*N* = 72) across three elementary schools had significantly higher ratings on classroom teacher ratings on the problem behavior scale of the *Social Skills Rating System* (Gresham & Elliot, 1990). These data indicate ODRs have evidence of validation for detecting problem behavior in the classroom, particularly those of an externalizing nature. Irvin et al. (2004) conducted a comprehensive review of the ODR validation literature. These researchers stated, "Office discipline referrals appear to be sensitive measures of the effects of interventions designed to change student behav-

ior and to improve school and classroom climate (p. 139)." In sum, ODRs appear to have evidence of validation in predicting classroom behavior problems, monitoring classroom behavior problems, and evaluating efforts to improve the classroom environment.

Despite this knowledge, further research suggests that ODR data should be interpreted with caution. Nelson, Benner, Reid, Epstein, and Currin (2002) found ODR data can often underestimate the needs of students with internalizing types of behavior (e.g., anxiety disorders and depression) but may identify a large number of students with externalizing types of behavior (e.g., disruptive, noncompliant). Although Nelson and colleagues found ODRs to be relatively strong predictors of poor outcomes, they also discovered ODRs have little predictive power in relation to other social-behavioral variables. Further, schools and teachers use ODRs differently, and may not have common definitions of behaviors that result in ODRs. Classroom management, discipline policies, levels of teacher tolerance, and a number of other variables influence the use of ODRs. Overall, ODRs are likely more representative of teacher behavior as opposed to student behavior.

The problem then from an applied behavior analytic standpoint is ODRs are not direct measures of student behavior. However, as previously stated, many studies in the PBS literature have used "indirect and subjective measures of behavior, such as disciplinary referrals by teachers" (Johnston et al., 2006). For example, Clonan, McDougal, Clark, and Davison (2007) used ODRs to inform decisions made by school problem-solving teams. The authors noted, "emphasis is placed on the use of ODRs as an ongoing barometer of *student behavior* that is useful to teams in developing and monitoring interventions" (p. 21, emphasis added). Although Clonan et al. suggested "these data at least minimally offer an accessible and widely available measure of school climate and student behavior in a given school site" (p. 21), they also stated ODRs have "the potential for teacher bias in the documentation of student behavior, variations in teacher tolerance for misbehavior, and a lack of independent or objective data related to the behavior" (p. 21).

Further, Hawken, MacLeod, and Rawlings (2007) used ODRs to monitor the effects of an elementary-based intervention with four groups of three students. They implemented a modified check-in, check-out system and found decreases in ODRs for each group. Unfortunately, in-class behavior was not reported. Hawken et al. stated that a change in ODRs "may not always directly correlate with reductions in problem behavior in the classroom" (p. 99).

Finally, Putnam, Luiselli, Handler, and Jefferson (2003) evaluated student disciplinary practices through the use of ODRs. The authors concluded ODRs are readily available in schools and are useful in identifying discipline problems, aiding in the design of interventions, and evaluating intervention outcomes. They acknowledged ODRs were not linked to actual in-class disruptive behavior. In fact, the authors questioned the reliability and validity of the ODR data reported in their study. ODRs "may have decreased because the classroom teacher was singled out or her management skills improved over time" (p. 522).

Overall, we see in much of the PBS literature the use of ODRs as the primary dependent measure despite the fact the au-

thors themselves note concerns with the reliability and validity of these data in representing actual in-class student behavior. Thus, the purpose of this study was to determine if ODRs represent overall disruptive classroom behavior.

■ METHOD

This investigation occurred throughout the 2006-2007 academic year. Data were collected on 25 students receiving secondary-level interventions and 20 students receiving tertiary-level interventions at three public elementary schools located in an urban area in the Northwest (see Table 1). Students who were not responding to the primary-level programs received secondary-level interventions. Students who were not responding to the primary-level programs and/or the secondary-level interventions received tertiary-level interventions. These decisions were based on *SWIS* data (i.e., level of ODRs) and on the professional judgment of classroom teachers and counseling staff.

PARTICIPANTS

School 1. At the beginning of the study, there were 23 students initially identified by school staff. Two students moved immediately before the study began and one was added during the fourth week after noting the severity of the behaviors exhibited by the student. Five students were in the same class; unfortunately, the teacher was not able to record in-class data on all five students. It was decided that the teacher would keep data on the three most severely behaved students. Thus, 20 students (12 students receiving secondary-level interventions [2 in special education and 10 in general education], 8 students receiving tertiary-level interventions [2 in special education and 6 in general education]) across 12 classrooms were included in the study for School 1.

School 2. A group of 23 students were initially identified by school staff. Two students who were identified because of academic rather than behavioral issues were excluded from the study. Five students were removed from the study because their teachers could not commit to recording behavioral data. One student moved at the beginning of the study and another moved during the study. Thus, 14 students (8 students receiving secondary-level interventions [1 in special education and 7 in general education], 6 students receiving tertiary-level interventions [1 in special education and 5 in general education]) across 10 classrooms were included in the study for School 2.

School 3. A group of 17 students were initially identified by school staff. Six students were removed from the study because their teachers could not commit to recording behavioral data. Thus, 11 students (5 students receiving secondary-level interventions [1 in special education and 4 in general education], 6 students receiving tertiary-level interventions [2 in special education and 4 in general education]) across eight classrooms were included in the study for School 3.

SETTING

School 1. School 1 had an enrollment of 342 students (61% male, 39% female). School demographics included 85% Caucasian, 7.8% Hispanic, 4.5% Black, 0.9% Asian, and 1.5% American Indian/Alaskan Native. Thirteen percent of students received special education services and 69% of students qualified for free and reduced-priced lunches. There were 20 teachers at the school.

School 2. School 2 had an enrollment of 371 students (49% male, 51% female). School demographics included 92.7% Caucasian, 2.1% Hispanic, 2.4% Black, 2.1% Asian, and 0.3% American Indian/Alaskan Native. Ten percent of students received special education services and 28% of students qualified for free and reduced-priced lunches. There were 22 teachers at the school.

School 3. School 3 had an enrollment of 294 students (53% male, 47% female). School demographics included 85.9% Caucasian, 5.9% Hispanic, 4.3% Black, 1.0% Asian, and 2.6% American Indian/Alaskan Native. Fourteen percent of students received special education services and 60% of students qualified for free and reduced-priced lunches. There were 15 teachers at the school.

SCHOOL-WIDE POSITIVE BEHAVIOR SUPPORT

All three schools had been involved in positive behavior support programs over a period of several years. All three schools implemented a three-tier PBS model. Components of the model follow.

School 1. All students were taught five broad expectations (i.e., be kind, be safe, be cooperative, be respectful, be peaceful) across all school settings (i.e., classroom, playground, hallways, cafeteria, bathroom). Students were taught these expectations at the beginning of the school year; these expectations were reviewed after winter and spring breaks. These lessons were designed and implemented to meet the needs of each classroom. Students were provided a slip for displaying the appropriate behavior. Students who earned these slips put them in a container in their classroom, where weekly raffles rewarded students with the privilege of lunch with the principal. Student recognition breakfasts occurred every six weeks. The slips were counted every Friday and sent home with students to show their parents. In addition, staff handed out slips to any class exhibiting the expectations, not including their own class. When individual classrooms received 10 classroom slips, the teacher arranged a party in the classroom. The entire school received an extended recess on Fridays when each classroom earned 50 slips.

When problem behaviors occurred, students were sent to a personal responsibility (PR) room supervised by the school's counselors. This room was a locker room used for small group instruction as well individual skills training, counseling, and in-school suspension. The two counselors taught expectations and allowed students space to calm down while the classroom teachers continued to teach their class.

Students were given ODRs and referred to the principal for any behaviors that were chronic and/or severe in nature, physically dangerous to themselves or to others, illegal, or flagrantly disrespectful of authority. Parents were involved at this level in developing an intervention that would meet their individual child's needs. Monthly meetings were held to discuss progress made in the program and to evaluate data from *SWIS* for active decision making.

Students who did not respond to the primary-level programs were targeted for secondary-level interventions. Secondary-

Table 1. Student Information

Student	School	Grade	Intervention Level	Special Education Yes/No	Frequency of In-Class Behaviors	ODRs
1	1	K	Secondary	No	147	1
2	1	2	Secondary	No	114	2
3	1	2	Secondary	No	67	0
4	1	2	Secondary	No	91	2
5	1	3	Secondary	No	75	0
6	1	4	Secondary	No	95	0
7	1	4	Secondary	No	89	0
8	1	4	Secondary	No	84	3
9	1	4	Secondary	Yes	10	0
10	1	4	Secondary	Yes	74	1
11	1	5	Secondary	No	23	1
12	1	5	Secondary	No	80	0
13	2	K	Secondary	No	297	1
14	2	1	Secondary	No	197	1
15	2	2	Secondary	No	234	0
16	2	2	Secondary	No	84	0
17	2	2	Secondary	No	288	0
18	2	4	Secondary	No	253	0
19	2	5	Secondary	No	52	1
20	2	5	Secondary	Yes	126	3
21	3	K	Secondary	Yes	41	2
22	3	1	Secondary	No	74	4
23	3	1	Secondary	No	287	2
24	3	2	Secondary	No	623	7
25	3	3	Secondary	No	272	7
Mean					151.08	1.52
Student	School	Grade	Intervention Level	Special Education Yes/No	Frequency of In-Class Behaviors	ODRs
26	1	1	Tertiary	No	986	1
27	1	1	Tertiary	Yes	422	1
28	1	2	Tertiary	Yes	241	0
29	1	2	Tertiary	No	292	0
30	1	3	Tertiary	No	255	2
31	1	3	Tertiary	No	148	2
32	1	3	Tertiary	No	20	0
33	1	5	Tertiary	No	43	2
34	2	K	Tertiary	No	203	3
35	2	3	Tertiary	No	146	3
36	2	3	Tertiary	No	108	3
37	2	4	Tertiary	Yes	586	2
38	2	4	Tertiary	No	256	0
39	2	5	Tertiary	No	216	0
40	3	K	Tertiary	No	185	3
41	3	2	Tertiary	No	81	1
42	3	3	Tertiary	Yes	261	6
43	3	3	Tertiary	Yes	194	7
44	3	3	Tertiary	No	1238	8
45	3	5	Tertiary	No	3016	3
Mean					444.85	2.35
Overall Mean					281.6	1.89

level interventions included group social skills training, labeled formal and informal friendship groups, and placement of students in structured classrooms with strong teachers. The counselors would often form small groups based on the behavioral needs of the students, then reteach the five expectations. Students at this level of intervention come to the PR room to cool off and regroup before reentering the classroom. The student had a chance to problem solve with the counselor and receive booster training so the teacher had a chance to continue to teach.

Students who did not respond to these secondary-level interventions were targeted for tertiary-level interventions. Tertiary-level interventions included individualized wraparound services, functional behavior assessments (FBAs), special education support, one-on-one counseling from a school counselor, one-on-one social skills training, a check in/check out system (Filter et al., 2007), weekly reports to parents, mentors, and outside counseling. The counselors worked with these students in the PR room.

School 2. All students were taught five broad expectations (i.e., be safe, be kind, be respectful, be cooperative, and be caring). The school used the counseling staff to teach weekly classes in social skills. In addition, the school used the *Character Counts* (Josephson Institute, 1996) curriculum to teach the six pillars of character (i.e., trustworthiness, respect, responsibility, fairness, caring, and citizenship). The school had a school-wide token system at the primary prevention level. Staff were trained to provide tokens when students were observed meeting expectations. Students who earned tokens put them in a container in their classroom, where weekly raffles rewarded students with small school-related items, the designation "students of the week," and their name listed on an electronic reader board in front of the school.

A plan was constructed to increase supervision of students within common areas, the playground, and bus-loading zone. Students were brought to specialists such as teachers in physical education or music by their classroom teacher and were not allowed to return to class without their classroom teacher. Likewise, students were not allowed to be on the playground without adult supervision or to be in the halls during recess or lunchtime without a hall pass.

The secondary-level intervention consisted of social skills training for small groups. Specific groups formed in response to the individual needs of the students; these included friendship groups and instruction in character traits, social skills, and the five expectations.

Tertiary-level interventions included the use of FBAs, behavior intervention plans (BIP), more intense social skills training, check in/check out system (Filter et al., 2007), outside counseling, special contracts, and off site intensive behavioral interventions. Employment of special education services was used for some students.

School 3. All students were taught four broad expectations (i.e., practice safety, act responsibly, work hard, and show respect). Students were taught these behavioral expectations at the beginning of the school year and were also reminded of these expectations at the beginning of the winter and spring school

sessions. Students received slips for following the behavioral expectations. Teachers were provided with approximately five slips per week and were advised to hand them out randomly to students who followed the behavioral expectations. Students who earned slips turned them in for a weekly raffle, which rewarded students with tangible items (e.g., pencil, candy). All of the leftover slips were then saved; if at the end of the month 500 slips had been earned, the whole school received a privilege (e.g., movie and popcorn at recess).

The secondary-level intervention included the check in/check out system (Filter et al., 2007). Tertiary-level interventions included one-on-one counseling with the school counselor, one-on-one skills training, and daily/weekly reports to parents. In addition, an individualized behavior contract was developed and signed by the student, teacher, principal, and parent. If students followed the expectations within their behavior contract, they were allowed "free time" when they could go to the counseling center to play games or take a break.

MEASURES

Two measures were used in this investigation: in-class reporting and office discipline referrals (ODR's). In-class reporting consisted of classroom teachers at all three schools collecting data on a daily basis for each student using a frequency count. Frequency counts across several behavioral categories were noted. These behavioral categories included inappropriate language, fighting, overt defiance, disruption, harassment/teasing, damage to property, and noncompliance (e.g., failure to return to task after being verbally prompted by the teacher). Operational definitions were provided for each behavior and discussed with participating teachers. Data sheets listing behavioral categories were provided to teachers once a week for 17 weeks, and collected weekly. The ODRs were entered into the *SWIS* monthly by counseling staff. Only ODRs that resulted from in-class behaviors were considered. Teacher return rates of the data collection forms were 85%, 75%, and 67% for School 1, School 2, and School 3, respectively.

DATA ANALYSIS

Four analyses were conducted to address the purposes of the present investigation. First, descriptive statistics were used to detail mean average number of office discipline referrals and in-class behavior problems by intervention level (i.e., secondary and tertiary) and special education status (i.e., receiving or not receiving special education services). Follow-up measures of skewness and kurtosis were conducted to analyze normality of the variables and revealed positive skew in both cases. Office discipline referral measures of skewness and kurtosis were 4.65 ($SE = .35$) and 24.91 ($SE = .70$), respectively. In-class behavior problems measures of skewness and kurtosis were 1.43 ($SE = .35$) and 1.46 ($SE = .70$), respectively. Skewness and kurtosis statistics of greater than two times the standard error often indicate non-normal distributions (Hildebrand, 1986). Therefore, the measures of skewness and kurtosis revealed both office discipline referrals and in-class behavior problems to be non-normal distributions. Second, due to small sample size, unequal variances among groups receiving secondary- and tertiary-level interventions, and the results of skewness and kurtosis, non-

parametric independent samples tests were conducted to determine whether statistically significant differences existed between the frequency of in-class behaviors and office discipline referrals of students receiving secondary- and tertiary-level interventions. The Mann-Whitney U Test is more appropriate than the *t*-test in cases of unequal sample sizes, non-normal distributions, and unequal variances (Siegel & Castellan, 1988). Third, the Mann-Whitney U test was conducted to determine whether the differences between the frequency of in-class behaviors and office discipline referrals of students receiving special education services ($n = 9$) and those not receiving such services ($n = 36$) were statistically significant. Finally, a measure of correlation between the frequency of in-class behaviors and office discipline referrals was conducted. Spearman's ρ rank order non-parametric measure of correlation was considered a more appropriate statistic over the more common Pearson product-moment correlation because of the non-normal distributions of the variables.

INTEROBSERVER AGREEMENT

Interobserver agreement was conducted by graduate students (Schools 1 and 2). Graduate students and teachers independently recorded in-class problem behavior. Frequency of problem behavior recorded was compared after each session by graduate students. Interobserver agreement was calculated by dividing the smaller number of observed behaviors by the larger number and multiplying by 100.

School 1. Interobserver agreement was taken weekly by a special education graduate student who was trained in data collection methods. The graduate student randomly observed one of the 12 classrooms for 1 hour once a week on Fridays. Observations occurred in each of the classrooms at least once per week. Overall, the mean interobserver agreement was 95% (range: 50% to 100%).

School 2. Interobserver agreement was taken weekly by another special education graduate student who was trained in data collection methods. To determine which student to observe, participating students were selected at random so that all teachers were watched at least once per student (e.g., teachers who had two identified students were observed twice, once for each student). Each observation lasted approximately 20 to 30 min. Observation time varied in length due to time of day and student tasks. Overall, the mean interobserver agreement was 83% (range: 33% to 100%).

■ RESULTS

Descriptive statistics. The overall frequency of office discipline referrals (ODRs) ranged from 0 to 8, with a mean of 1.9 ($SD = 2.2$), whereas the overall frequency of in-class behavior problems ranged from 10 (Student 9) to 3,016 (Student 45), with a mean of 281.6 ($SD = 479.4$). Mean average frequency of ODRs for students receiving secondary- and tertiary-level interventions was 1.5 ($SD = 2.0$) and 2.4 ($SD = 2.3$), respectively. Mean average frequency of in-class behavior problems for students receiving secondary- ($n = 25$) and tertiary-level ($n = 20$) interventions was 151.1 ($SD = 133.1$) and 444.9 ($SD = 677.9$), respectively. Mean average frequency of ODRs for students receiving and not

receiving special education services was 2.4 ($SD = 2.5$) and 1.8 ($SD = 2.1$), respectively. Mean average frequency of in-class behavior problems for students receiving ($n = 9$) and not receiving special education services ($n = 36$) was 217.2 ($SD = 188.3$) and 297.8 ($SD = 528.7$), respectively.

Differences between the frequency of in-class behaviors and office discipline referrals of students receiving secondary- and tertiary-level interventions. Statistically significant differences were found between the frequency of in-class behaviors of students receiving secondary- and tertiary-level interventions ($U [1, 44] = 145.0$, $p < .05$). As highlighted above, students receiving tertiary-level interventions had a higher number of in-class behaviors ($M = 444.9$, $SD = 677.9$) than students receiving secondary-level interventions ($M = 151.1$, $SD = 133.1$). Although students receiving tertiary-level interventions had a higher number of office discipline referrals ($M = 2.4$, $SD = 2.3$) than students receiving secondary-level interventions ($M = 1.5$, $SD = 2.0$), the difference between their frequency of office discipline referrals was not statistically significant.

Differences between frequency of in-class behaviors and office discipline referrals of students receiving special education services and those not receiving such services. Although students not receiving special education services ($M = 297.8$, $SD = 528.7$) displayed higher frequency of in-class problem behaviors than their counterparts receiving special education services ($M = 217.2$, $SD = 188.3$), the difference between their frequency of in-class problem behaviors was not statistically significant. Students receiving special education services had greater frequency of office discipline referrals ($M = 2.4$, $SD = 2.3$) than those not receiving such services ($M = 1.8$, $SD = 2.1$), yet the difference between the groups was not statistically significant.

Correlation between the frequency of in-class behaviors and office discipline referrals was conducted. A small positive relationship utilizing the Spearman's ρ measure of correlation ($\rho = .242$, $p = .109$) was found between the frequency of in-class behaviors and office discipline referrals. This correlation was not statistically significant.

■ DISCUSSION

The main finding of this investigation was that there was a weak relationship between teacher recordings of disruptive classroom behaviors and ODRs. This finding is important in that a critical aspect in the success of PBS is the determination of which students need additional behavioral support. According to Irvin et al. (2006), ODR data can be used to determine where efforts are needed to improve school safety and social climate, including classroom and non-classsroom school settings. Schools that use ODR data to determine which students are in need of additional level of support may assume that ODRs are a good representation of actual classroom behavior. However, in the present investigation, the correlation between in-class behavior and ODRs raise questions as to the representativeness of ODRs for disruptive classroom behaviors. Therefore, it seems prudent to use multiple sources of data including those that are objective and direct when considering which students need additional support. This recommendation is consistent with Irvin and colleagues (2004) who recommended "triangulating" ODR

measures. This term suggests implementing other measures in addition to ODRs.

The results of this investigation show that ODRs cannot be assumed to be representative of the level of disruptive classroom behavior, at least as recorded by teachers. It is possible that each teacher had different tolerance levels and each school building had different definitions as to what behaviors constituted an office discipline referral (Tidwell et al., 2003). Repeated off-task behavior (i.e., noncompliance to teacher instructions) to some teachers may result in an ODR whereas other teachers might attempt to address the behavior in class. Additionally, ODRs could be frowned upon in some school buildings. The very nature of school-wide PBS relies upon public displays of ODR data. Therefore, it is possible that teachers may refrain from sending students to the office given that the response will be shown in the ODR data reported to staff. Many teachers may simply refer a student to the office for only the most defiant or dangerous aggressive behaviors.

It is important to point out that these schools were not novices in PBS. In fact, a school-wide PBS program was in place at all three schools. All schools received extensive training in the PBS model over a period of several years. For example, data from the *School-wide Evaluation Tool* (*SET*, Todd et. al., 2004) have been used to access overall success of the implementation of school-wide PBS. According to Horner et al. (2004), a score of 80% for the Expectations Taught subscale score and 80% *SET* Total score indicate the school-wide PBS primary prevention practices are being implemented. In this investigation, the Expectations Taught subscale score for the three schools were 100% for School 1, 70% for School 2, and 100% for School 3. The *SET* Total scores were 89.0%, 85.9%, and 86.0% for Schools 1, 2 and 3, respectively. Therefore, based on *SET* data, Schools 1 and 3 were implementing primary-level programs while School 2 was near the goal percentage for Expectations Taught and surpassed the goal for the *SET* Total score. It is important to point out that these scores were obtained from personnel trained to use the *SET* who were not associated with this research project.

A number of limitations and areas of future research are evident. First, the data obtained by the teachers on the frequency of behaviors of students are somewhat questionable for several reasons. Teachers may have been unable to record or view all the behaviors exhibited by the target students. Additionally, teachers did not return all data collection sheets even with consistent prompting. The reality is that it is frequently difficult to motivate teachers to collect ongoing data in their classrooms. Every effort was made to simplify the data collection method as much as possible; however, the return rates ranged from 67% to 87%. Finally, although interobserver agreement was recorded in two schools, it was not conducted in the third school due to scheduling difficulties with the secondary observer. Therefore, the data gathered in this investigation should be viewed as an initial attempt to answer the research question. Future research should attempt to strengthen the technical aspects of conducting direct observations of behavior in applied settings.

Second, the use of frequency counts for behaviors may not be the most appropriate measure for all behaviors. For example, noncompliance in the form of off-task behavior can be measured via a partial interval recording (Martella, Nelson, &

Marchand-Martella, 2003). However, due to the complexity of the classroom environment and the difficulty associated with recording the occurrence of multiple behaviors for multiple students, it was decided to simplify the data collection method. Teachers aided in the development of the data collection form and felt confident they could accurately record in-class behavior. Therefore, although the method of recording of behaviors is a concern, the simplicity of the method allowed teachers to make the needed recordings throughout the day.

Third, due to the category of in-class behaviors, it is not clear if all of the behaviors recorded by teachers were major and/or minor. However, the behaviors listed on the recording form were considered by teachers to be major behaviors. These behaviors were also listed as major behaviors at each of the three schools. Additionally, when a behavior did occur, teachers viewed the behavior as being significant enough to record it. Future research should consider the use of more refined recording methods that can discriminate whether behaviors were indeed major or minor. More importantly, it is important to determine if and how many of the classroom behaviors should have led to an ODR but did not do so and how many ODRs resulted from behaviors that should not have resulted in an ODR.

Finally, the schools represented in this study were from the Pacific Northwest. Therefore, the results of this study may not generalize to other students in other schools. More research is needed to determine the validity of ODRs and actual classroom behaviors across different schools and different classrooms. Additional variables that impact student behavior should be considered in future investigations. For example, the teachers' use of effective behavior supports, behavior management training level of teachers, and curriculum used are all critical variables in student behavior.

In conclusion, the data collected in the current investigation had limitations. However, every effort was made to collect ongoing behavioral data while limiting the reactivity and complexity of the data collection process. Perhaps these data should be viewed as a reflection of the correlation between ODRs and the level of in-class behaviors as *reported* by teachers rather than the correlation between ODRs and *actual levels* of in-class behavior given the reported limitations in the methods used to collect and document behavior. However, despite the reported limitations, it seems possible to conclude that the use of ODRs to determine the effects of PBS are suspect and efforts to improve objective and direct data collection procedures should take place. Applied behavior analytic procedures require the use of direct behavioral measures. Unfortunately, ODRs do not provide such measures and may represent teacher behavior as compared to student behavior.

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Early Childhood Autism Services: How Wide is the Research to Practice Divide?

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Abstract

This study investigated educational service usage in a community sample of 73 children (2-6 years) with autism spectrum disorders (ASD). Data were collected through child assessments and in-person interviews with caregivers. Specifically caregivers were asked about when services were initiated, what types of services families were receiving for their young children with ASD, and satisfaction with current services. Of particular interest to the current study were the number of hours of services per week and the number of children receiving evidence-based treatments and therapies, which were broadly defined as based on the principles of applied behavior analysis (ABA). It was also investigated if child characteristics (autism symptomatology, adaptive behavior, and aberrant behavior) and demographics (maternal education, family income) were related to current services. Results suggest that on average, children received 5.42 different services totaling 14.85 service hours per week. A significant relation between service hours and adaptive behavior existed, such that lower adaptive behavior was associated with more service hours. Although less than 20% of the sample received interventions based on the principles of ABA, higher aberrant behavior scores were associated with more hours of ABA-based services. Results indicated that children received a wide range of services; however, there remains a significant gap between evidence-based practice recommendations and community practices in this sample.

Autism Spectrum Disorders (ASD) comprise the fastest growing neurodevelopmental disorders in children (CDC, 2007). ASD are not well understood given the unknown etiology, differences in symptomatology, and range of functioning. Until recently, ASD were rarely diagnosed prior to age 4 (Bryson, Zwaigenbaum, McDermott, Rombough, & Brian, 2007; Howlin & Moorf, 1997). However, research indicates signs of autism are apparent in some infants by 16 months and possibly as early as 9 months (Vismara & Rogers, 2008). Numerous treatment studies, representing a range of interventions and approaches, have highlighted the benefits of Early Intervention (i.e., starting treatment during the first three years of life) for young children with or at risk for autism suggesting services should begin as soon as an ASD is suspected (Dawson & Osterling, 1997; National Research Council, 2001). Given that early detection is necessary for early intervention, early surveillance, screening, and diagnostic tools for autism have received recent attention from pediatricians and other clinicians (Johnson & Myers, 2007).

Due to the dramatic growth in the prevalence of young children with ASD, evidence of the benefits of early intervention (Dawson et al., 2009), and the increased availability of quality early screening and diagnostic tools, there is a growing demand for evidence-based early education services for young children with ASD. We use the term services throughout this paper to refer to the educational treatments (e.g., Pivotal Response Treat-

ments; direct instruction; milieu teaching; discrete trial teaching) and related services and therapies (e.g., speech or occupational therapy) children with autism receive. These treatments and therapies can be guided by one of many approaches (e.g., applied behavior analysis [ABA], developmental, eclectic). The American Academy of Pediatrics recommends that young children (under 6 years) with ASD receive at least 25 hours of educational services per week (Myers & Johnson, 2007). However, the types, specific therapies, or approaches for these services are not prescribed. There is no standard approach, treatment, or therapy for autism; furthermore, there is no system of accountability for the quantity *or* quality of these services. Important questions remain about the research to practice divide. For example, how many young children with autism receive 25 hours per week of services? And, how many service hours include evidence based treatments, therapies, or practices?

The plethora of educational, alternative, fad, and supplemental services for autism can be extremely confusing for caregivers. Not surprisingly, many caregivers are willing to try a variety of services, often at the same time (Metz, Mulick, & Butter, 2005). In fact, research indicates caregivers of children with autism use a broad array of services, particularly when their children are young (Thomas, Ellis, McLaurin, Daniels, & Morrissey, 2007). For example, a recent survey found parents of children with autism reported using up to seven therapies and treatments at one time, including speech therapy, visual schedules, sensory integration therapy, teaching based on principles of ABA, social stories, vitamin C, etc. (Green, Pituch, Itchon, Choi, O'Reilly, &

Sigafoos, 2006). Many of these commonly used therapies and treatments for autism have not been validated scientifically; thus, are not considered evidenced-based. For example, practitioners who employ a sensory integration framework may suggest that children with autism need assistance with processing sensory input. Sensory integration therapy involves providing activities or environmental stimuli that challenge or stimulate the child to effectively use all of his senses to self-regulate (Ayers, 1972; National Autism Center, 2009). Sensory integration therapy, although popular with practitioners and families, lacks scientific evidence for treating ASD (Arendt, MacLean, & Baumeister, 1988; National Autism Center, 2009; Reichow, Barton, Neely, Good, & Wolery, 2010).

EVIDENCE-BASED PRACTICES

Evidence-based practices are defined as those that have demonstrated efficacy (i.e., a functional or statistical relation) through rigorous, published empirical studies (Dunst & Trivette, 2009). Although scientific evidence is the cornerstone of defining evidence-based practices, professional judgment, data-based decisions, family preferences, culture, and feasibility may be considered when determining the "evidence-base" of evidence-based practices (American Psychological Association, 2005; National Autism Center, 2009). In the past several decades, education science and the research literature on evidence-based practices for young children with autism has noticeably grown. For example, there are numerous published literature analyses (e.g., Rogers & Vismara, 2008; Simpson, 2005), special journal issues (see *Journal of Autism and Developmental Disorders, 2002),* evaluative methods (Reichow, Volkmar, & Ciccheti, 2008), books (National Research Council, 2001), and technical reports (National Autism Center, 2009) devoted to evidence-based practices for autism. These publications synthesize and describe which treatments are effective for addressing core deficits in ASD in young children. As a result, the field of early intervention/early childhood special education (EI/ECSE) has a set of evidence-based practices and treatments related to positive outcomes for young children with autism and their families.

Most of the *evidence-based* educational treatments for young children with autism are based on the principles of ABA (e.g., antecedent based treatments, modeling, joint attention, script-based interventions, self-management; National Autism Center, 2009). Ample studies support the efficacy of interventions based on principles of ABA in increasing scores on standardized assessments as well as promoting less restrictive educational placements (e.g., Eikeseth, Smith, & Eldevik, 2002; Howard, Sparkman, Cohen, Green, & Stanislaw, 2005; Lovaas, 1987). Many states have conducted independent reviews of the literature to identify evidence-based practices for autism. These reviews overwhelmingly substantiate the use of treatments based on ABA (e.g., Maine Administrators of Service for Children with Disabilities, 2000; New York State Department of health, Early Intervention Program [NYSDOH], 1999). Furthermore, it is the only approach for autism treatment recommended by the U.S. Surgeon General (United States Surgeon General, 2001).

ABA applies methods based on scientific principles to increase socially useful behaviors and decrease maladaptive behaviors (Cooper, Heron, & Heward, 2007). ABA is commonly

misconstrued as synonymous with discrete trial teaching (DTT) or early intensive behavioral intervention (EIBI); however, ABA is not defined by one specific type of treatment or therapy. In fact, principles of ABA were used to develop a range of treatments for autism (e.g., Pivotal Response Treatments, incidental teaching, peer-mediated instruction). Although research supports the use of treatments based on the principles of ABA, the extent to which children are receiving educational interventions based on the principles of ABA is unknown. There are some exceptions in which we are able to determine the number of children with ASD who receive evidence-based interventions (e.g., children attending intensive early intervention programs that are based exclusively on ABA principles). However, current research suggests the research to practice gap is wide. Thus, many children are not receiving evidence-based services, particularly in early childhood (Dunst & Trivette, 2009; Odom, 2009).

The discrepancy between research and community practice remains large despite the increased attention on evidence-based practices *and* parent and professional support for the use of evidence-based interventions (e.g., Callahan, Henson & Cohen, 2008; Dunst & Trivette, 2009; Stahmer, 2007). For example, research has identified autism specific skill deficits (e.g., delays in joint attention, imitation, responding to multiple cues), which should be the primary focus of intervention programs for young children with autism. These are also referred to as 'pivotal behaviors' because they are related to simultaneous changes in many other adaptive behaviors (Koegel & Koegel, 2006). However, early intervention approaches often take a more general approach, and often do not focus on these identified core deficits (Kasari, Freeman, & Paparella, 2001). Furthermore, recent research indicates that families may experience difficulties accessing the quality and intensity of services recommended for their child with autism (Thomas et al., 2007). The extent to which children with autism receive high quality and intensive EI/ECSE program remains relatively unknown in many geographical locales and has important implications for service delivery.

PURPOSE OF THE STUDY

To help elucidate what services a community sample of young children with ASD were receiving, a sample of families with children receiving early intervention or early childhood special education programs and services were interviewed. Specifically caregivers were asked about when services were initiated, what types of services their child with ASD received, and about their satisfaction with current services. Of particular interest to this study were the number of hours of educational services per week and the number of children receiving evidence-based treatments and therapies, which were broadly defined as based on the principles of ABA. It was also investigated if child characteristics (autism symptomatology, adaptive behavior, and aberrant behavior) and demographics (maternal education, family income) were related to current services.

■ METHOD

PARTICIPANTS

Participants were 73 caregivers and their young children (2-6 years) diagnosed with ASD in two adjacent counties near a mid-

Table 1. Child Demographics (N = 73)

Demographic	M	SD	n	%
Age in Months	55.48	12.15	–	–
Gender-Male	–	–	58	79.4
Race				
White/Caucasian	–	–	54	74.0
Black/African American	–	–	6	8.2
Hispanic/Latino	–	–	2	2.7
Asian	–	–	2	2.7
Mixed Race	–	–	9	12.3
Educational Program				
Early Intervention/Part C	–	–	7	9.6
Preschool	–	–	49	67.1
Preschool	–	–	17	23.3
Diagnosis				
Autism/Autistic Disorder	–	–	60	82.2
PDD-NOS	–	–	12	16.4
Asperger's Disorder	–	–	1	1.4
Adaptive Behavior – Vineland II				
Communication	73.71	16.27	–	–
Daily Living Skills	73.70	13.51	–	–
Socialization	69.42	9.72	–	–
Socialization	70.99	11.65	–	–
Autism Symptoms				
CARS Total Score	37.26	7.81	–	–
Non-symptomatic	–	–	14	19.2
Mild – Moderate	–	–	24	32.9
Severe	–	–	35	47.9
Temperament and Atypical Behavior (TABS)				
Total RTI SS	57.32	11.4	–	–

Table 2. Maternal and Family Demographics (N = 73)

Demographic	M	SD	n	%
Mother's Age in Years	36.01	5.90	–	–
Mother's Marital Status				
Married/Living with Partner	–	–	60	82.2
Separated/Divorced	–	–	8	11.0
Single	–	–	5	6.8
Mother's Highest Degree Obtained				
None	–	–	1	1.4
HS Diploma/GED	–	–	17	23.3
Vocational or Associate's	–	–	21	28.8
Bachelor's or higher	–	–	34	46.6
Mother's Employment				
Full- or Part-Time	–	–	35	47.9
Weekly hours	32.27	11.76	–	–
Siblings in Home				
None	–	–	17	23.3
One	–	–	34	46.6
Two	–	–	18	24.6
Three	–	–	4	5.5
Household Income/Year	$56,479	(32,656.93)	–	–

full-time or part-time. Those who were employed worked an average of 32.27 hours per week. The majority of children had siblings living at home (n = 56; 76.7%). The average household size was 4 people, with an income of $56,479 ($SD$ = 32,656.93; Median = $50,000; Range $10,000–$105,000). Approximately one-quarter (n = 19) of the sample was low income, according to federal poverty threshold guidelines for poor and near poor families. The range of annual income per capita for the low income group was $2,000–$6,667.

PROCEDURE

This study was approved by the first author's Institutional Review Board. To be included in the study, children: (a) had a medical diagnosis of ASD (i.e., autistic disorder/autism, Pervasive Developmental Disorder-Not Otherwise Specified, or Asperger's Disorder), (c) were six years or younger, and (d) were living with their primary caregiver for a minimum of 1 year prior to the beginning of the study. Although all children had formal diagnoses of ASD, this information was parent-reported and was not confirmed via medical records. Parents of children with ASD responded to recruitment flyers distributed by local early childhood programs. Parents were screened over the telephone to determine eligibility. Upon eligibility determination, in-person semi-structured interviews (approximately 2 hours) were scheduled in home or school settings to collect child and family information. Families received a $25 honorarium for their participation in the study.

size city in the northeastern United States. Tables 1 and 2 display child and family demographics, respectively. Children were an average age of 55.48 months (SD = 12.15), or 4.62 years old. Approximately 80% of children with ASD were male. Consistent with the demographics of the region, approximately 75% of the sample was White/Caucasian. The majority of children were receiving early childhood special education preschool, with fewer in kindergarten programs and Early Intervention / Part C programs (i.e., services for children younger than 36 months and their families). Over 80% were reported to have a diagnosis of autism/autistic disorder, with fewer reported to be diagnosed with Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) or Asperger's Disorder (see Table 1). In all but two families the primary caregiver was the child's biological mother. Mothers were an average age of 36.01 years and the majority was married or living with a partner. Slightly less than half of mothers held bachelor's degrees. Just over half of mothers in the sample did not work, with the remaining working either

MEASURES

Demographics. A family demographics sheet was created for the present study. Parents were asked open-ended questions pertaining to their child's age, sex, diagnosis, race, and early intervention history. Parents were asked open-ended questions pertaining to their age, race, education, job status, family income, and number of children and adults living at their residence.

Child services. Parents were asked open-ended questions regarding their child's current services. Following parents' responses to open-ended question, a list of common service options was presented and parents endorsed the presence or absence of these services. Based on caregivers' responses, services were coded as education, related services, and non-educational/medical approaches. Education service categories included: special education eligibility, presence of Individualized Education Plan (IEP) or Individualized Family Service Plan (IFSP), type of educational program (Early Intervention/Part C Program; preschool, or kindergarten), and school programming duration (full-time center-based program [5 hours/day for 5 days/week], part-time center-based program [less than 5 hours/day and/or less than 5 days/week], or itinerant program [home-based services only]. Related service categories included speech therapy (individual or group-based therapy provided by speech therapist or speech pathologist), occupational therapy with sensory integration (individual or group-based therapy provided by an occupational therapist that includes elements of "sensory input" such as brushing, bouncing, swinging, spinning, use of weighted vests, use of body socks, joint compression, messy play with varying textures, etc.), physical therapy (individual or group-based therapy provided by a physical therapist), other (1:1 aide, adaptive physical education, play group/therapy, music therapy, therapeutic listening, individual counseling). Services based on the principles of applied behavior analysis (ABA) included teaching that relied on altering antecedents and consequences to increase adaptive behavior and decrease maladaptive behavior. Approaches coded as based on ABA principles included discrete trial teaching, Pivotal Response Treatment, visual schedules, Picture Exchange Communication Systems (PECS), incidental teaching, verbal behavior techniques (e.g., teaching and reinforcing manding), and the use of scripts and task analyses to teach complex behaviors (e.g., daily living skills, social skills). Non-educational/medical approaches included taking vitamins (e.g., multivitamins, calcium), supplements (e.g., methyl B12 shots, fish oil, probiotics), chelation, or prescription medication. Medications were coded based on parent-reported information concerning the reason for the medication (behavior, allergies/asthma, seizures, or other). Although complementary and alternative medicine (CAM) have been defined quite broadly (e.g., medical approaches that are not based on Western medicine and have not been subject to clinical trials; Levy, Mandell, Merhar, Ittenbach, & Pinto-Martin, 2003), a more conservative operational definition was adopted in the current study. CAM was defined as vitamins (excluding multivitamins), supplements, and chelation used to treat autism symptoms.

Sources of information. Parents were read a list of nine sources of information and asked to indicate which of the sources they received information concerning autism. Sources of information included: books/magazines, internet, teachers/school, therapists, family members/friends, conferences/workshops, parent groups, pediatrician/physician, and other (an option used to describe a source of information not included in the aforementioned list).

Adaptive behavior. Researchers administered the survey interview form of the Vineland Adaptive Behavior Scales 2nd edition (Vineland-II; Sparrow, Cicchetti, & Balla, 2005) to assess the child's functioning in four domains: 1) Communication, 2) Daily Living Skills, 3) Socialization, and 4) Motor Skills. The domains combine to yield an overall Adaptive Behavior Composite standard score, with a mean of 100 and standard deviation of 15. Standard scores below 70 are considered low. Standard scores between 70 and 85 are considered moderately low. Standard scores between 85 and 115 are considered adequate. Standard scores between 115 and 130 are considered moderately high, with scores above 130 considered high (Sparrow et al., 2005). Reported internal consistency reliability coefficients on the survey interview form of the Vineland-II for domains and the Adaptive Behavior Composite (for children ages 0-5) are as follows: Communication, .92; Daily Living Skills, .89; Socialization, .93; Motor Skills, .90; Adaptive Behavior Composite, .97. Total administration time of the Vineland-II is approximately 30 minutes.

Autism symptomatology. Researchers used the Childhood Autism Rating Scales (CARS; Schopler, Reichler, & Renner, 1993) to rate children's autistic symptoms in 15 areas. Ratings on the CARS are made on 7-point scale reflecting numerical values of 1–4 (higher scores indicate more symptoms and greater impairment). Scores reflect the degree to which the child's behavior deviates from that of a normal child of the same age. Scores on the 15 items are summed to form an overall score ranging from 15–60, which has corresponding cut-scores reflecting severity of symptoms (<30 Non-Autistic; 30–36.5 = Mild to Moderate; 37–60 = Severe). The reported alpha coefficient for the CARS total score is .94. Administration time for the CARS is approximately 15 minutes.

Atypical behavior. Researchers used the Temperament and Atypical Behavior Scale (TABS; Neisworth, Bagnato, Salvia, & Hunt, 1999) to assesses atypical behaviors considered to be developmentally dysfunctional. The TABS is a 55-item checklist that contains items in four domains: (1) Detached (20 items), (2) Hypersensitive/Active (17 items), (3) Underreactive (11 items), and (4) Dysregulated (7 items). For each item, caregiver respondents indicates if the behavior is present or absent (rated as "yes" or "no") and whether they need help with the behavior. Raw domain scores can be summed to form the Temperament and Regulatory Index (TRI) or total raw score, which can be converted to a T-score ($M = 50$; $SD = 10$). Higher TRI scores are indicative of more atypical behavior. The split half reliability estimate for the TABS TRI is reported to be .95 for children developmental disabilities. Administration time for the TABS is approximately 15 minutes.

■ RESULTS

CHILD CHARACTERISTICS

Adaptive behavior. Children in this sample displayed a range of adaptive functioning, with standard scores on the Vineland-II Adaptive Behavior Composite ranging from 44 – 96 (M = 70.99; SD = 11.65). Children's scores on the Socialization subdomain (M = 69.42; SD = 9.72) were significantly lower than Communication subdomain scores (M = 73.71; SD = 16.27; t = 3.18, p = .002) and Daily Living Skills subdomain scores (M = 73.30; SD = 13.51; t = 3.98, p < .001).

Autism symptomatology. Children's autistic symptoms varied, with total scores on the CARS ranging from 22 – 55 (M = 37.26; SD = 7.81). Using the cut-scores provided in the CARS manual, 19.2% (n = 14) of children were characterized as having non-autistic symptoms, 32.9% (n = 24) as having mild to moderate symptoms, and 47.9% (n = 35) as having severe symptoms of autism.

Atypical behavior. Children in this sample had a number of atypical behaviors based on their scores on the TABS. A raw score of greater than 1 on a domain score indicates the presence of atypical behaviors considered to be developmentally dysfunctional. Mean raw scores for TABS domain scores were as follows: Detached (M = 8.49; SD = 4.02), Hypersensitive/Active (M = 7.44; SD = 4.41), Underreactive (M = 1.32; SD = 1.52), and Dysregulated (M = 1.96; SD = 1.68). The mean T-score for the TRI total score was 57.32 (SD = 11.4), suggesting higher than average atypical behaviors overall.

SERVICES

Parents reported that their children first received services at an average age of 25.18 months (SD = 10.70), due to developmental delays. On average, children in the current sample were diagnosed with ASD more than one year after initiating services (M age of diagnosis = 37.82 months; SD = 10.89). Sixty percent of parents reported an increase in services for their children upon receiving a diagnosis of ASD.

Table 3 displays the number and type of educational services that children with ASD were receiving at the time of data collection. All children had special education eligibility and were receiving school programming, with nearly 60% in part-time or itinerant-based programs (n = 42). The remaining 31 children (42.5%) received full-time center-based programs 5 days per week. On average, children were receiving 5.42 different services (SD = 1.42) in addition to special education. The mean number of service hours per week was 14.85 (SD = 7.74). The most commonly utilized services were: occupational therapy/sensory integration (95.9%), speech therapy (91.8%), and physical therapy (63%).

In addition to education and related services, parents reported on their child's use of non-educational medical approaches, including medications and vitamins. Approximately two-thirds of the sample (n = 49) reported that their child took vitamins or other medications; including supplements, chelation, and medications aimed at reducing behavior problems (see Table 4). Nearly 20% (n = 14) of parents in the current sample reported using CAM as an autism treatment approach for their child.

Table 3. Special Education and Related Services (N = 73)

Services	n	%
Special Education		
IFSP/IEP	73	100
Special Education Eligibility	73	100
School Programming		
Part-time or itinerant	42	57.5
Full-time programming (5 hrs/day)	31	42.5
Related Services		
Speech Therapy	67	91.8
1x 30 min/week	3	4.1
2x 30 min/week	6	8.2
3x 30 min/week	11	15.1
4x 30 min/week	10	13.7
5x 30 min/week	35	47.9
8x 30 min/week	1	1.4
10x 30 min/week	1	1.4
Occupational Therapy with Sensory Integration	70	95.9
1x 30 min/week	2	2.7
2x 30 min/week	30	41.1
3x 30 min/week	31	42.5
4x 30 min/week	3	4.1
5x 30 min/week	4	5.5
Physical Therapy	46	63
1x 30 min/week	6	8.2
2x 30 min/week	30	41.1
3x 30 min/week	12	16.4
5x 30 min/week	1	1.4
Other Services		
1:1 Aide	15	20.5
Adaptive P.E.	3	4.1
Play Group/Therapy	4	5.5
Music Therapy	4	5.5
Therapeutic Listening	1	1.4
Services based on ABA	14	19.2
1-5 hrs/week	4	5.5
7-10 hrs/week	4	5.5
15 hrs/week	1	1.4
20 hrs/week	4	5.5
25 hrs/week	1	1.4
	M	SD
Total number of different services	5.42	1.42
Total service hours/week	14.85	7.74

Table 4. Non-Educational/Medical Approaches (N = 73)

Non-Educational/Medical Approach	n	%
Vitamins/Medications	49	67.1
Vitamins	28	38.4
Supplements (e.g., methyl-B12, fish oil)	14	19.2
Chelation	2	2.7
Medications – behavior	8	11.0
Medications – allergies/asthma	11	15.1
Medications – seizures	1	1.4
Medications – other	11	15.1
Complementary and Alternative Medicine (CAM)	14	19.2

Table 5. Sources of Information about Autism (N = 73)

Information Source	n	%
Books/Magazines	68	93.2
Internet	64	87.7
Teachers/School	36	49.3
Therapists	53	72.6
Family Members/Friends	47	64.4
Conferences/Workshops	39	53.4
Parent Groups	29	39.7
Attend regularly	16	21.9
Pediatrician/Physician	11	15.1
Other	28	38.4

Parents rated their overall satisfaction with their child's current services using a 5-point scale (1=Very Dissatisfied; 2=Dissatisfied; 3=Neutral; 4=Satisfied; 5=Very Satisfied). The majority of parents reported high levels of satisfaction with their child's current services, with 75% reporting that they were either satisfied (n = 17) or very satisfied (n = 38) with their child's services. The remaining 25% of the sample reported either neutral (n = 4) levels of satisfaction or some level of dissatisfaction (n = 4 dissatisfied; n = 1 very dissatisfied).

Table 5 describes the sources of information about autism that parents in this sample reportedly accessed. The majority of the sample received information about autism from books/magazines, the internet, therapists, family members/friends, and conferences/workshops. Only 15% reported that they received information about autism from their child's physician. On average, families reported 5.14 (*SD* = 1.91) different sources of information about autism. The number of sources of information was significantly correlated with their reported satisfaction with this information (r = .43, p <.001). Families with more sources of information reported higher satisfaction. The number of sources of information was also significantly correlated with the child's total number of service hours per week (r = .28, p = .016), suggesting a relation between more sources of information and more child service hours per week.

RELATIONS AMONG SERVICES AND CHILD AND FAMILY CHARACTERISTICS

Table 6 provides interrelations among services received and various child and family characteristics. As predicted, there were significant correlations between number of different services received and: total service hours per week (r = .56, p < .001), number of therapy hours based on ABA approach per week (r = .33, p = .004), and receipt of complementary and alternative medicine (r = .27, p = .020). There was a significant negative relation between Vineland-II Adaptive Behavior Composite standard scores and the number of different services received (r = -.33, p = .004) and the total number of service hours received per week (r = -.24, p = .040), such that lower functioning children received a greater number of different services as well as more service hours per week. Children's age was significantly correlated with number of school hours received per week (r = .61, p < .001), such that older children received more special education hours per week. Children's age was also significantly

correlated with autistic symptomatology (r = -.36, p = .002), with younger children having more symptoms on the CARS. Children's autistic symptomatology on the CARS was significantly related to their adaptive functioning on the Vineland-II (r = -.51, p < .001) and their atypical behaviors on the TABS (r = .69, p < .001), with all relations in the expected direction. Children's atypical behaviors were significantly associated with number of ABA hours received per week (r = .24, p = .038), with children with more atypical and dysfunctional behavior receiving more ABA-based intervention hours per week. Maternal education and household income were positively correlated with children's adaptive behavior (r = .31, p = .007 and r = .28, p = .016, respectively), but not with other child impairment indices, such as atypical behaviors or autistic symptomatology. Neither maternal education nor household income significantly correlated with number of different services received, the total service hours per week, or specific services (see Table 6).

■ DISCUSSION

The primary goal of this investigation was to examine educational service usage in a community sample of young children with ASD. We investigated if child characteristics (autism symptomatology, adaptive behavior, and aberrant behavior) and demographics (maternal education, family income) were related to current services. According to parent reports, findings suggest that children's services were initiated an average of 12.64 months prior to receiving a formal diagnosis of ASD. Although services were initiated early, the majority of parents reported an increase in their child's services upon receiving an ASD diagnosis, suggesting that a formal diagnosis may be important to access additional services. Children with ASD in the current sample were reported to receive an average of 5.42 different services, providing further evidence that parents often seek multiple services for their children at the same time (Green et al., 2006; Metz et al., 2005). A large proportion of children were reported by their parents to take medications, including vitamins and supplements. The most commonly reported therapy was occupational therapy with sensory integration (95.9%), which is concerning given the lack of empirical support for sensory integration therapy (e.g., National Autism Center, 2009). Only 19.2% of the sample was reported to receive services based on

Table 6. Correlations Among Services/Therapy and Child and Family Characteristics

Variable	1	2	3	4	5	6	7	8	9	10	11
1. No. of Services	—										
2. Service Hours	.56***	—									
3. School Hours	.00	-.05	—								
4. ABA Hrs/Wk	.33**	.65***	-.16	—							
5. CAM	.27*	.20	.12	.08	—						
6. Child Age	-.17	-.06	.61***	-.18	-.04	—					
7. CARS Total	.12	.11	-.21	.13	-.05	-.36**	—				
8. Vineland-II ABC	-.33**	-.24*	-.02	-.04	-.10	-.03	-.51***	—			
9. TABS TRI	.10	-.11	-.02	.24*	.13	-.15	.69***	.35**	—		
10. Maternal Educ	-.03	.04	-.09	-.02	.10	-.19	-.18	.31**	.13	—	
11. Income	.07	.10	-.07	.04	.11	-.17	-.21	.28*	.11	.53***	—

Note. *** $p < .001$. ** $p < .01$. * $p < .05$.
ABA = Applied Behavior Analysis.
CAM = Complementary and Alternative Medicine.
CARS = Childhood Autism Rating Scale.
Vineland-II ABC = Vineland Scales of Adaptive Behavior-II Adaptive Behavior Composite Standard Score.
TABS RTI = Temperament and Atypical Behavior Scale Temperament Regulatory Index.

principles of ABA. Services based on an ABA framework have received ample support in the literature, with several recent meta-analyses documenting the large positive effects of this approach (e.g., Eldevik, Hastings, Hughes, Jahr, Eikeseth, & Cross, 2009; National Autism Center, 2009; Reichow & Wolery, 2009). Service hours for all combined therapies averaged 14.85 hours per week, well under the recommended intensity suggested by the American Academy of Pediatrics (Myers & Johnson, 2007) and other practice guidelines (National Autism Center, 2009; National Research Council, 2001).

Not only were children in the current sample receiving fewer service hours per week than best practice recommendations, but a number of children were reported to use complementary and alternative medical treatments (e.g., vitamins, supplements, chelation) that have no evidence to support their efficacy for children with ASD (Myers & Johnson, 2007). Although quite commonly utilized (e.g., Levy et al., 2003), such alternative treatments may be harmful and are thus not recommended for use (Levy & Hyman, 2005).

In addition to exploring service utilization, we investigated the relation among various child characteristics and family demographics. Of note was the relation between indices of socioeconomic status (SES) and children's adaptive behavior. Maternal education and household income were positively correlated with children's adaptive behavior. This relationship was strongest when family income was correlated with the Receptive Language subdomain from the Vineland-II ($r = .313$, $p = .007$). These findings parallel those reported by Hart and Risley (1995) in that family income was predictive of children's language. Interestingly, SES was not significantly related to children's atypical behaviors (TABS scores) or autistic symptomatology (CARS scores). Neither maternal education nor household income significantly correlated with number of different services received, the total service hours per week, or specific services.

IMPLICATIONS

The results from this study have direct implications for practice and policy. The findings support previous research suggesting the research to practice gap is significant (e.g., Dunst & Trivette, 2009; Stahmer, 2007). Further, research-to-practice discrepancies exist for both quality (i.e., type) and quantity of services. These findings should be particularly alarming considering the wide body of research supporting intensive early intervention. For example, Yoder and Stone (2001) found a direct, positive relation between the number of hours of speech services between ages 2 and 3 and later language skills in young children with ASDs. Further, the National Research Council (2001) published a set of essential components for effective interventions for young children with ASDs based on existing research. The essential components include: starting services as early as autism is suspected, 25 hours per week of direct, intensive services, repeated, structured teaching opportunities addressing communication skills, play with peers, social skills, and maintenance and generalization of skills. The results of the current study suggest children did receive services as soon as an ASD was suspected and before age 3 (i.e., 25 months); however, on average, the children received well below the recommended quantity of services. The most commonly reported service received was occupational therapy with sensory integration, which does not inherently or directly address communication skills, play with peers, social skills, and maintenance and generalization of skills, or provide repeated, structured teaching opportunities. As such, occupational therapy with sensory integration is not considered an evidence-based practice for children with autism.

As mentioned above, parents in this sample sought several different services for their children. This multiple treatment approach is significant because it makes it difficult for parents and practitioners to determine which treatment is related to positive changes. Further, little is known about the combination or interaction of treatments for autism. These results suggest parents

are spending a good deal of time and resources seeking treatments for their children in addition to the educational services provided. Thus, family support, education, and training might be a particularly important component to any service plan for young children with autism. Also, systems for collaboration between agencies, educational teams, and other service providers is often lacking in early intervention (National Research Council, 2001; Stahmer, 2007). Systems for coordination and collaboration can be expensive, difficult to monitor, and time intensive. However, collaboration and coordination are essential components of quality care for young children with autism because they are receiving a multitude of services from a myriad of agencies and providers (National Research Council, 2001). Although parents may be responsible for seeking out treatments for their young children, they may be limited to services, therapies, and approaches that education systems and agencies make available. Thus, state and local agencies should ensure that services offered are evidence-based and empirically supported.

LIMITATIONS

There are at least six limitations worth noting. First, the sample represents a small geographic catchment area. From this perspective, the results might be considered a restricted estimate of the services sought by families with children with autism. Second, the majority of families were satisfied with the services they received and volunteered to participate in this study. This sample of families had time to complete data collection, which took approximately 2 hours. Thus, the sample might be missing families who were dissatisfied with services or had a lack of time or resources to spend participating in the study. It should be noted, however, the sample represents families with children with a range of autism severity. This is important because families of children with the most severe needs might have little time to devote to interviews. Third, this sample represents children already diagnosed and receiving services, thus the external validity of findings may be limited. Fourth, these results included self-report data from parents related to the autism diagnosis and symptoms. According to parent informants, all children had been formally diagnosed with ASD; however, at the time of data collection, children showed a range of autistic symptoms, according to their scores on the CARS. Although the largest proportion of children exhibited symptoms consistent with severe autism, a minority of children had scores on the CARS in the non-autistic range (total score <30). It is unknown if these children had more severe symptoms at the time of diagnosis and they improved over time and/or with intervention, or if they were inaccurately diagnosed. The majority of children in the sample, however, continued to have at least mild to moderate symptoms. The results from the CARS and TABS suggest most of the sample presented with symptomatology and levels of aberrant behavior consistent with autistic disorder in the DSM-IV-TR (American Psychological Association, 2000). Self-report data were also gathered from parents regarding their child's educational service and medication usage. Data from educational, medical records, or prescriptions were not used to corroborate educational service utilization and medications, making it impossible to say with certainty that the reported data were accurate. Fifth, the data collection methods were insufficient to

determine the specific curriculum and instructional approaches used with a number services (e.g., speech or physical therapy). Thus, our determination of scientifically supported approaches was likely conservative, given that we categorized only those approaches that were explicitly based on the principles of ABA as evidence-based. Finally, reliability data (e.g., interobserver agreement, interrater agreement) were not collected during parent interviews.

FUTURE RESEARCH

This study highlights the need for future research in several areas. Little is known about parent perceptions of services. Future research should further examine the variety of services parents seeks as well as the social validity of these treatments. Evidence suggests that parents are seeking a variety of services for their young children with autism; however, their perceptions of these services are unknown. Furthermore, it would be important to identify cost associated with service utilization, particularly the out-of-pocket cost that parents pay above what is provided by schools and public agencies. Parent perceptions of the feasibility of the procedures, relevance of the outcomes, and efficacy of interventions are also relatively unknown. Understanding parent perceptions may elucidate why parents are using specific treatments. Further, family barriers to early identification and access to services needs further study. Longitudinal and cross-sectional research should address a variety of family characteristics as they relate to access to services. This can inform both surveillance efforts for identifying young children who might be at risk for autism as well as service delivery models for community agencies. This research will likely require educational districts and community agencies to partner with medical clinics to develop efficient systems for referral and monitoring.

Future research should also examine multicultural issues in autism. As mentioned above the sample in the current study was primarily White/Caucasian. Research on multicultural issues in autism is necessary to inform both policy and practice. Additional research examining issues related to age of diagnosis, access to services, and perceptions of services are necessary in families from diverse racial, ethnic, linguistic, and cultural backgrounds (Mandell, Listerus, Levy, & Pinto-Mrtin, 2002; Mandell et al., 2009).

Finally, future research should examine ways to ensure community agencies have access to professional development and the resources necessary to implement evidence-based practices at recommended levels. Research should examine effective service delivery models, systems of collaboration and coordination, and family involvement for serving young children with autism in community settings. For example, the National Autism Center (2009) has recently developed an educator's manual that delineates evidence-based practices in the schools for children with ASDs. Future research could investigate the usage and utility of this manual in school-based service delivery. In sum, these results provide further support for professional development, research, and changes in policy related to the implementation of evidence-based practices for young children with autism and their families in community programs.

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