ABA RESEARCH ARTICLE SUMMARY
E-NEWSLETTER
MAY 2011

TOPIC: Manding

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“The Comprehensive autism solutions company”
The Picture Exchange Communication System (PECS) is seen as an effective way to allow people who do not speak the ability to ask for items they need. It involves an individual using the exchange of a picture icon to “ask” for a desired item. Recent research has focused on the effectiveness of the PEC system as well as comparing this system with other types of augmentative communication, such as sign language.

PECS VERSUS SIGN LANGUAGE
The effectiveness of the type of communication used may differ according to the situation, concludes a study comparing picture exchange communication system and sign language training to teach manding in two children (Tincani, 2004). The results of the study showed that each type of communication is effective but their value depends on the participants’ abilities and motivation as well as the procedures involved in teaching each skill. The PEC system may be a more effective communication tool for children who lack the ability to imitate hand motor movements, as is the case in many children with autism, concluded the study. In the study, procedures had to be modified to encourage the children to produce vocalizations (i.e., The participant who was more successful with PECS icons stopped using vocalizations and allowed the researcher to speak the words. The researcher modified his procedure, waiting an extra 4 seconds to deliver the item requested to encourage the child to vocalize). One of the participants was more successful with sign language training and the other was more successful with PECS training so there was no significant difference as to which method was more easily learned and retained.

Key Learnings For Clinicians And Parents
This study illustrates that communication facilitated through the exchange of picture icons can be very functional for a learner, but suggests alternative means of communication (such as sign language) may be a better fit for some. Additionally, the study highlights the importance of pairing the exchange of an icon with a vocalization, so that a learner continues to build vocal expressive language skills.

PECS AND MANDING LANGUAGE SKILLS
The acquisition of manding language after PECS training has been shown to improve the ability of children to communicate their wants and reduce problem behavior, according to the findings of Chartop-Chirsty, Carpenter, Le, LeBlanc and Kellet (2002). The researchers trained three participants in the use of the PECS. The participants then used the PECS during academic situations as well as during free play to ask for items they wanted. The participants also were monitored for vocalizations as they engaged in academics and free play. The results of this study showed that the participants’ rate of vocalizations increased while their rates of problem behavior decreased as they were successful in manding using the PECS. There seemed to be no need to maintain certain problem behaviors as a more effective means of asking for items was taught (PECS).

Key Learnings For Clinicians And Parents
This study highlights how important a functional means of communication is for a person with delays in language development, and helps to show how viable a means of communication the Picture Exchange Communication System can be.

MAINTENANCE OF PECS SKILLS
A meta-analysis done by Flippin, Reszka and Watson (2010) analyzed several studies (both single subject and group designs) that used the PECS to teach participants to ask for items. The researchers studied the statistical strength of the studies as well as the validity and ability to replicate the study. It was found that many studies that focused on individuals with autism lacked a maintenance and generalization component and this weakened the studies somewhat. The researchers found that as far as communication training is concerned, the PECS is an adequate tool, but again, the research shows a lack of checking for maintenance and generalization, key components of teaching individuals with autism. As far as eliciting speech from individuals with autism, this analysis showed questionable effectiveness of the PECS in increasing vocalizations across the studies. Again, the researchers stressed a lack of testing for maintenance of skills as a weakness of many studies.

The Picture Exchange Communication System (PECS) is an effective way for children with autism to communicate. The acquisition of mand skills after PECS training further improves communication skills.

Key Learnings For Clinicians And Parents
This study illustrates that while the Picture Exchange Communication System may not naturally promote an increase in the number of vocalizations a learner produces, pairing the exchange of an icon with a vocalization is critical in teaching emerging language skills. In addition, it is also critical that learners utilizing PECS maintain use of the icons introduced at all learning stages of PECS instruction. Learners should utilize PECS to communicate across a variety of environments and settings.

The Picture Exchange Communication System can be an effective tool for teaching individuals who do not speak to communicate. The pictures do not require any specialized language to understand and can be particularly useful for individuals with fine motor limitations. Unfortunately, many studies that have focused on this tool lack a maintenance and generalization component, which would strengthen many of the studies, especially in the field of working with people with autism.
REFERENCES


MAND EMERGENCE

Mand emergence tends to depend on the antecedents and on whether the individual is motivated to produce the mand. Children with autism are not always motivated to mand for items or information without prior training. What types of situations can be contrived and under what types of conditions to allow an individual with autism to produce emergent (or novel) mands without being directly trained to request the specific item or information has been the subject of several research studies.

**Motivation and the Emergence of Mands**

Antecedents can play an important role in influencing motivation. A study by Egan and Barnes-Holmes (2010) modified antecedents to see if they could manipulate and produce the emergence of untrained mands in eight children with autism. The researchers trained the children to tact — to identify an item based on general conditioning — and sought to find out if a mand would emerge from the tact training. They used nonsense words to eliminate the possibility of any participant having been taught the words ahead of time. They used positional commands (e.g., *Place the [object] [direction] here*, and *Where do you want me to put the [object]?*)? The participants were required to mand for the object to be placed in the correct position.

According to the results, some participants showed emergent dependence, only producing untaught mands directly after the tact was taught; some showed modified antecedent dependence, only producing untaught mands when the antecedent was manipulated; and some participants showed both types of dependence, depending on which training method was used. The researchers concluded that modifying the antecedents is the most effective way to produce emergent mands. Listener-tact training, whereby a person is required to put a labeled object in a specific position, was also suggested as a potentially effective way to produce emergent mands, but the sample was too small for this to be certain.

Key Learnings for Clinicians and Parents

This study illustrates the importance of identifying motivation when teaching a child with autism, particularly when teaching new skills. Additionally, the study suggests that a child may require further instruction specific to emerging language skills, in order to be able to adequately communicate wants or needs.

**Tact and Mand Training**

In a similar study, Egan and Barnes-Holmes (2011) evaluated specific antecedent control (standard vs. modified) in relation to the emergence of mands and tacts. This study involved typically developing preschool children under very similar conditions as their earlier study (described above). The participants received mand or tact training (e.g., *Where do you want me to put the [object]?* or *Where is the [object]?) and were tested to see if the appropriate mand or tact emerged independently from the training (i.e., If tacts were trained, was the child able to produce the corresponding mand?). The majority of the participants were able to produce the untaught mand or tact following training in the other tool. Some participants were able to produce the untaught mand under both standard and modified antecedent conditions and some were not, leading the researchers to conclude that independence in mand emergence has more to do with discriminative stimulus (SD) control than antecedent conditions.

Key Learnings For Clinicians And Parents

This study highlights the importance of identifying a child’s motivation and the need for additional instruction specific to language development. It also highlights how important stimulus control is when providing instruction.

**Generalized Manding and Reinforcement**

The positive correlation between higher language development and an increase in mands skills has been demonstrated. Hernandez, Hanley, In-
gvarsson and Tiger (2007), for example, studied the emergence of novel manding in a complete sentence (e.g., “I want water, please” vs “water”) in one child with speech/language delays and the emergence of novel one word manding as opposed to “undesirable” manding (e.g., pointing, grabbing) in one child with speech/language delays and one typically developing child. The researchers used prompting and differential reinforcement to encourage the use of full sentence and one word manding in the children. The children who started with “undesirable” mands were then taught full sentence mands for some items after one word mands were consistent.

The results show that all of the children were able to generalize the framed (full sentence) mands to some of the desired items. Thus, individuals should be encouraged to use full sentences rather than one word (or pointing, and so forth) when asking for items, even though past research has indicated that one word mands could be acceptable, conclude the researchers. The presence of generalized, novel full sentence manding shows that some individuals are capable of learning an even more complex system of manding if taught using prompts and differential reinforcement with standard methods of teaching children with autism.

**Key Learnings For Clinicians And Parents**

This study highlights how successful the utilization of differential reinforcement procedures can be when building higher-level language skills. However, professionals working with a beginning or early learner may establish that a one word vocal request for an item is appropriate for the time, particularly when the learner-in-question does not yet produce multisyllabic vocalizations.

**REFERENCES**


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**ESTABLISHING OPERATIONS FOR MANDS**

Teaching people with disabilities to mand, or ask for what they want, is an important behavioral tool. Many instances of problem behavior, including aggression toward others and self-injurious behavior, occur because individuals cannot ask for what they need. A large part of being successful in teaching individuals how to mand is establishing the effectiveness of a stimulus as a reinforcer. This process is known as establishing operations (EOs).

**FUNCTIONAL COMMUNICATION TRAINING**

Manding is the core focus of functional communication training. The goal is to teach a learner to use communication as a replacement behavior for a problem behavior. The replacement behavior is a functional alternative behavior for the targeted problem behavior, providing the same reinforcement as the problem behavior. Examples of manding include:

- saying “cookie” instead of hitting to receive a cookie that is in a mother’s hand, or
- exchanging a “break” card instead of engaging in tantrum behavior to get out of completing a worksheet.

Most children with a limited manding repertoire will engage in problem behavior as a means to communicate. Therefore, as a proactive behavioral strategy, manding should be a part of every learner treatment package since when problem behavior occurs, it decreases the number of learning opportunities.

**DEVELOPING ESTABLISHING OPERATIONS**

Establishing operations play a key role in mands training. It is also important for individuals to be able to generalize these mands across establishing operations. Notably, the use of contrived and/or manipulated establishing operations can create a more effective teaching environment for manding. The creation of contrived transitive conditioned establishing operations—a stimulus that increases the value of a second stimulus—has proven to be effective, according to a study by Rosales and Rehfeldt (2007). An example is a behavior chain wherein the presence of one stimu-
lus, such as a toothbrush, causes the second stimulus, such as toothpaste, to gain more reinforcing value as it is needed to complete the task. This approach is highly motivating to an individual learning to mand. The study involved teaching two adult participants with IQs of 24 and 36 to mand using picture icons for items needed to complete a behavior chain. The participants showed 100 percent accuracy after training for mands under transitive conditioned establishing operations as compared to less than 33 percent pre-intervention accuracy rates.

TEACHING DISCRIMINATION SKILLS
In a similar study, researchers manipulated establishing operations to teach complex discrimination between items and the mand for the more preferred item. Picture cards were used and the preferred items manipulated through different phases of manding (i.e., using distractor cards, having one preferred item constantly available and a second one delivered only when the correct picture was given) (Gutierrez, Jr. et al., 2007). The findings were significant and add to the research showing the usefulness of picture card mand training to discriminate between items.

- Language discrimination is difficult for many children with developmental disabilities. Using the distracter cards to break down discrimination may aid a child in responding correctly, increasing access to reinforcers and motivation for learning.
- The distractor cards can be used in mand training when using a picture exchange response and, later on, for transferring to the tact and intraverbal operant.

GENERALIZATION TRAINING
Generalization training is important for teaching children how to ask for what they want in different contexts. Mands for information can be generalized across establishing operations, concludes Lechago, Carr, Grow, Love and Almason (2010). The study involved three children with autism who were given a task and then had to ask “where” a missing item was to complete the task. This study was different from the two previous studies in that the children were required to vocalize the mand in a sentence and taught to generalize asking for the item. To teach generalization, several tasks that require different uses for the missing item were presented so the children were required to identify when they needed the item in the behavior chain. Functional communication is one of the most important skills that can be taught to individuals with disabilities. Being able to communicate wants and needs increases the independence and quality of life of a child with autism. A useful task for researchers is to find better, more innovative ways of teaching functional communication so that it can be taught to a wider variety of individuals. The current research is introducing different ways to teach manding skills to make the biggest impact in the lives of people with disabilities.

Key Learnings for Clinicians and Parents
- Manding should be the first skill taught when a child is starting behavioral intervention. It incorporates the practices of establishing operations and gaining access to reinforcement.
- To increase responses in the future, the use of behavioral interventions to increase motivation should always be assessed to ensure the effectiveness of the reinforcement delivery.
- Transitive conditioned establishing operations: If the motivation is to finish the task, a clinician can pair two stimuli to act as discriminative stimuli to signal the availability of reinforcement.
- Stimulus-stimulus pairing can be used to increase or decrease the effectiveness of reinforcement.

Developing adaptive skills is crucial when teaching children with autism. These are usually taught through a behavior chain. Manding can be incorporated into this training. For example, the EO could be completion of task, whereby the EO of gaining access to the item is increased to complete the task.

Manding is an important skill that reduces problem behavior in autistic children. Establishing operations can improve the effectiveness of manding by providing reinforcement and increasing motivation.

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DEVELOPMENT OF JOINT ATTENTION SKILLS
Joint attention is the ability of an infant to share a common focus with another person on objects or events through the use of cues such as head movements, eye gazing and, later, pointing. Children with autism tend to have difficulties with this skill. The inability to understand how to share a common focus on something, either by attending to what another person is looking at or prompting another person to coordinate their attention with that of others, could be an early marker of autism in infants, according to researchers.

Children with autism are slower to develop joint attention skills but after two years of age they begin to catch up. Training in joint attention skills, as well as language and social skills, have been shown to support the development of joint attention behaviour.

JOINT ATTENTION DEVELOPMENT IN TODDLERS WITH AUTISM
Children with autism are more likely to be slower in joint attention development but they begin to close the performance gap as they age, according to a study by Naber et al. (2008). Toddlers with autism from 24 to 42 months of age were compared to toddlers with other types of delays (language, intellectual disabilities) and a control group of toddlers who showed no delays. The researchers attempted to initiate joint attention behaviors (checking, gaze following and pointing) from the children and videotaped the sessions using a software package that codes for these behaviors.

The researchers discovered that toddlers with autism showed significantly more deficits in all types of joint attention behaviors at 24 months but eventually “caught up.” After two years, they began to only show deficits in joint visual attention, or attending to and looking where another person is looking. However, it is impossible to speculate on whether these joint attention delays are due to symptoms of autism or the child’s developmental level, suggest the authors.

LINK TO LANGUAGE SKILLS DEVELOPMENT
The level of your child’s language skills may indicate his or her joint attention abilities, concludes Murray et al. (2008), who studied the relationship between joint attention and language development in children with autism. The researchers tested all participants’ receptive language skills. They then attempted to initiate joint attention behaviors from the children by looking at something out of the child’s reach and recording if the child did the same. The researchers prompted the child using gestures and the word “look” if the child failed to look. The children were then given time to play with their caregivers and the amount of vocal utterances by the children were measured.

The strong association with language development shows the potential of training to improve joint attention skills. The researchers found a significant correlation between more joint attention responses by the children and increased language utterances as well as better performance on receptive language skills assessments. By focusing on language skills development, there is the potential to support the development of your child’s joint attention abilities. They stressed, however, that this study did not examine either expressive language or social functioning and future research needs to address these topics.

JOINT ATTENTION SKILLS TRAINING
Children respond positively to training in joint attention skills, according to a study by Isaksen and Holth (2009), which examined the teaching of joint attention skills to children with autism. The researchers assessed baseline joint attention skills in all participants. The children were then trained in three phases. The first phase taught them to respond to the initiation of joint attention by another person, the second phase established the social reinforcers that usually come with joint attention responses and the third phase taught the children to use the skills learned in turn-taking tasks. All the children showed a higher percentage of joint attention skills after training. The children also showed comparable or an even higher percentage of joint attention skills one month after training, which suggests that they maintained the learning.

While joint attention deficits seem to be one of the markers for autism, focusing on improving joint attention abilities can support your child’s overall development. Children with autism seem to have difficulty both responding to the joint attention bids of others and initiating joint attention with others. Based on these studies, it is likely that teaching children with autism joint attention skills will help them in other areas as well.

Key Learnings for Clinicians and Parents
The development of joint attention skills is associated with the development of other skills, including language development, suggests the body of applied literature. The above studies illustrate the importance of teaching joint attention behavior to children with autism spectrum disorders, who may not display joint attention skills, as the development of this skill can lead to growth in other major deficit areas, including language and social skills.

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