Perspectives of the ASHA Special Interest Groups
SIG 12, Vol. 3(Part 4), 2018, Copyright © 2018 American Speech-Language-Hearing Association

Assessing Symbol Acquisition and Preference During Functional Communication Training With English Language Learners Who Use Augmentative and Alternative Communication

Susan S. Johnston

Robert E. O'Neill

Joan Schumann

Department of Special Education, The University of Utah
Salt Lake City, UT

Disclosures
Financial: Susan S. Johnston has no relevant financial interests to disclose. Robert E. O'Neill has no relevant financial interests to disclose. Joan Schumann has no relevant financial interests to disclose.
Nonfinancial: Susan S. Johnston has no relevant nonfinancial interests to disclose. Robert E. O'Neill has no relevant nonfinancial interests to disclose. Joan Schumann has no relevant nonfinancial interests to disclose.

Purpose: *The purpose of this article is to provide interventionists with a strategy for comparing the efficiency of initial graphic symbol acquisition in an individual's 1st and 2nd language for English language learners who use augmentative and alternative communication (AAC) during functional communication training (FCT).*

Conclusions: *There is strong empirical support for the use of FCT to reduce problem behavior and increase appropriate communication for individuals with disabilities who use AAC. Furthermore, there is an emerging body of research examining the use of FCT among English language learners who use AAC. Interventionists can combine the knowledge gleaned from these 2 areas of research in order to assess language proficiency and preference while teaching communicative replacements to challenging behaviors.*

Functional communication training (FCT) is an empirically validated intervention for decreasing problem behavior by teaching the use of a replacement behavior that serves the same function as the problem behavior. FCT has been recognized as an established intervention to personally and academically benefit individuals with disabilities and has been shown to be effective across different ages, genders, disability classifications, and functions (e.g., Durand & Moskowitz, 2015; Kurtz, Boelter, Jarmolowicz, Chin, & Hagopian, 2011; Reichle & Wacker, 2017).

Augmentative and alternative communication (AAC) is frequently used as a replacement behavior in the context of FCT (Walker & Snell, 2013). When using AAC as a replacement behavior, interventionists must make decisions regarding the mode of communication (e.g., graphic mode, gestural mode), symbol systems to use within a given mode (e.g., photographs or line drawings within the graphic mode), and specific vocabulary that will be taught (e.g., a general vocabulary item such as "want" or a specific vocabulary item such as "chocolate bar").

When implementing FCT with AAC users who are also English language learners, additional decisions such as the language of symbols and the language used in the context of instruction must also be made. However, if an AAC user who is an English language learner is also a beginning communicator, it can be difficult for practitioners to make these decisions prior to starting FCT. In

this situation, practitioners may consider designing an intervention that allows for a comparison between the impact of instruction in the AAC user's first and second language.

By drawing on the existing literature, the steps for conducting FCT with beginning AAC users while comparing the impact of the first and second language include (a) conducting and interpreting a functional behavior assessment (FBA), (b) identifying the communicative replacement behavior(s), (c) conducting FCT, and (d) monitoring progress and making data-based decisions. This article describes the steps involved in the implementation of this intervention strategy and illustrates the implementation of the strategy through a case example.

Case Example: Meet Gabriela

Gabriela is a 4-year-old child with a diagnosis of autism. She lives in a home where Spanish is the primary language spoken and attends a classroom where English is the primary language spoken. Gabriela is a beginning communicator who does not yet use symbolic communication. Her current communicative behaviors include grunting, crying, and eye contact. Gabriela's Individualized Education Program team noted that she has recently begun to engage in the challenging behaviors of tantrums and noncompliance.

Conducting and Interpreting the FBA

FBAs typically involve one or more of three procedures. These procedures include (a) indirect assessments such as interviews, rating scales, or questionnaires such as the Motivation Assessment Scale (Durand & Crimmins, 2002), the Functional Analysis Screening Tool (Iwata, DeLeon, & Roscoe, 2013), or the Questions About Behavioral Function Scale (Matson, Tureck, & Rieske, 2012); (b) direct observation and data collection in settings/situations in which challenging behaviors are occurring; and (c) functional analyses in which environmental variables are manipulated in a controlled manner and data are collected on the occurrence of challenging behavior (O'Neill, Albin, Storey, Horner, & Sprague, 2015). The primary outcomes of an FBA are to identify (a) the range of challenging behaviors exhibited by an individual, (b) the motivating operations and antecedent events that occur prior to challenging behaviors, and (c) the consequences that are reinforcing and maintaining the behaviors (O'Neill et al., 2015). This information is then used to generate one or more summary statements or hypotheses that pull together the information to guide the selection of intervention strategies.

For individuals who are English language learners, an important consideration in the FBA process is the potential influence of language on assessment results. For example, Rispoli et al. (2011) conducted functional analysis sessions with a young child with severe disabilities from a Spanish-speaking home and found that the child engaged in higher levels of challenging behavior during sessions conducted using English. Therefore, an FBA with an AAC user who is also an English language learner should include collecting information on whether the individual responds similarly or differently in situations in which different languages are being employed.

Case Example: Describing and Understanding Gabriela's Behavior

FBA interviews and direct observations are conducted, and data are collected on whether Gabriela responds differently in situations in which different languages are employed. The data collected in the context of the FBA resulted in the following summary statement: "When Gabriela is asked to engage in activities she will tantrum in order to try to escape from the task demands, regardless of whether English or Spanish is used." Although differences are not noted in the use of English or Spanish when conducting the FBA, interventionists decide to provide instruction in both languages (see below) in order to determine (a) if language of instruction impacts the rate of acquisition of target skills and (b) Gabriela's language preferences.

Identifying the Communicative Replacement Behavior(s)

Based on the outcomes of the functional behavioral assessment, interventionists must identify a communicative behavior that serves the same function to replace the existing challenging behaviors. The replacement behavior can be verbal/vocal, gestural, or graphic. There are several factors to consider when deciding upon the replacement behavior for AAC users. Specifically, practitioners should ensure that (a) the individual's skills and abilities (e.g., cognitive, physical, sensory) are considered, (b) the new behavior is more efficient (in terms of response effort, quality of reinforcement, immediacy of reinforcement, and/or rate of reinforcement) than the existing challenging behavior, (c) the replacement behavior is distinctly different from the challenging behavior, and (d) communication partners will recognize and respond to the new behavior (e.g., Johnston, Reichle, & Evans, 2004; Tiger, Hanley, & Bruzek, 2008; Winborn-Kemmerer, Ringdahl, Wacker, & Kitsukawa, 2009). Furthermore, in order to compare the impact of FCT in both languages, practitioners must create symbols in both languages (Aguilar, Chan, White, & Fragale, 2017; Duran, Bloom, & Samaha, 2013; Padilla Dalmau et al., 2011). To date, studies that have used graphic symbols in two languages to compare the impact of FCT across languages have created symbols that differed only in the language of the written word (e.g., Padilla Dalmau et al., 2011). However, it seems logical that interventionists should also ensure that the pictures provided on the symbols are culturally specific.

Case Example: Replacing Gabriela's Escape Behavior

After careful consideration of multiple factors, Gabriela's interventionists choose to use a colored line–drawn symbol representing "Walk" as a replacement for her escape-motivated challenging behavior. In order to conduct FCT while also comparing the influence of language of instruction, two symbols are created. One symbol includes the word written in English, and the other symbol includes the word written in Spanish.

Conducting FCT in Both Languages

FCT involves identifying the situations and antecedents in which challenging behaviors typically occur based on the FBA information and then setting up those situations and antecedents as instructional opportunities. Then, prior to the occurrence of the challenging behavior, interventionists prompt the AAC user to engage in the alternative behavior. When a symbol is selected, the relevant reinforcer (e.g., escape from the demand situation) is then provided (Reichle & Wacker, 2017).

In order to compare the impact of instruction in the AAC user's first and second language in the context of FCT, practitioners may consider an intervention that uses an alternating treatment design. An alternating treatment design allows interventionists to compare the effects of two or more interventions on one behavior by rapidly alternating between the two interventions (Cooper, Heron, & Heward, 2007; McDonnell, Jameson, & Rose, 2011). When using an alternating treatment design to examine the impact of language of instruction, FCT involves providing instruction and teaching the symbols in both languages. Specifically, practitioners will alternate between instructional sessions that consist of providing prompts, cues, praise statements, and graphic symbols in the individual's first language and instructional sessions that consist of providing prompts, cues, praise statements, and graphic symbols in the individual's second language (Aguilar et al., 2017; Duran et al., 2013; Padilla Dalmau et al., 2011; Schuman, O'Neill, & Johnston, 2012). When implementing an alternating treatment design, interventionists should minimize the impact of sequence effects (the impact of the order that interventions are presented on outcomes) by rapidly alternating between the presentation of each intervention and randomizing the schedule of presentation of interventions.

It is important to note that an alternating treatment design is susceptible to carryover effects. Carryover effects refer to the impact of one intervention on another intervention. In other

words, it is possible that the positive impact of intervention conducted in one language can result in a positive impact of intervention conducted in the second language. Although this is a threat to the internal validity of empirical investigations that use alternating treatment designs, carryover effects that result in the generalization of skills to other conditions is often considered a positive outcome in educational settings (McDonnell et al., 2011). After the AAC user reaches criterion with both symbols, language preference can be examined by implementing several opportunities where both symbols are presented along with their verbal labels in each language and allowing the AAC user to choose between symbols when communicating.

Case Example: Teaching Gabriela to Use AAC in Both Languages

Gabriela's interventionists use the context of instructional requests during class activities to prompt her to use the "Walk" symbols to request a break from the requests. The team creates 10 instructional opportunities per day and decides that, when she uses a "Walk" symbol, she will be allowed to walk away from the activity for a 60-s break. The interventionists use an alternating treatments design to compare differences when providing instruction (e.g., prompting, cues, praise statements) and teaching symbols in English and in Spanish. The intervention procedures when providing instruction differ only in the language used. The English and Spanish treatment sessions are administered in a randomly counterbalanced order to control for sequence effects. After Gabriela reaches the criterion with both symbols, preference is examined by implementing several opportunities where both symbols are presented along with their verbal labels in either Spanish or English and allowing Gabriela to choose between symbols when communicating.

Monitoring Progress and Making Data-Based Decisions

A critical component of FCT is collecting data on the occurrence of the alternative and challenging behaviors. This data collection can occur in a variety of ways. For example, a basic frequency count can be used to record the number of times the alternative behavior is exhibited or a challenging behavior is exhibited each time a relevant opportunity is presented (e.g., when instructional demands are presented). Data can also be collected on the level of prompting required (if any) for the alternative behavior. Data can then be summarized as a percentage of opportunities with alternative or challenging behaviors and reviewed on a frequent basis to determine if the alternative behavior is being successfully acquired and is being exhibited in place of the challenging behavior (Reichle & Wacker, 2017).

Case Example: Monitoring Gabriela's Behavior

Gabriela's teachers collect daily data on the occurrence of use of the "Walk" symbols versus the challenging behavior when instructional requests are made of her during activities. Data are summarized, plotted on a graph, and then reviewed weekly to determine if the FCT is producing the desired outcomes. Collecting and summarizing data allow Gabriela's teachers to make decisions as to whether changes need to be made to the training process (e.g., additional/altered prompting) or if instruction should continue without changes.

Summarized data reveal that Gabriela shows a consistently high occurrence of problem behavior (i.e., 100% of all trials) and a consistently low occurrence of replacement behavior (i.e., 0% of all trials) during the baseline phase. After moving to the intervention phase, Gabriela begins to increase her unprompted use of replacement behaviors, and replacement behaviors are acquired equally quickly during both language conditions. At this point, Gabriela also demonstrates a decreasing trend in problem behavior, which continues throughout intervention (i.e., only occurring 0%–20% of trials within a given session).

After reaching criterion in both languages, Gabriela is provided with the picture symbols in both languages and allowed to choose between them. Gabriela does not show any preference in terms of selected language condition (i.e., when presented with both the English and Spanish picture symbols, Gabriela selects the English symbol just as often as the Spanish symbol). Furthermore,

the occurrence of problem behavior remains low during this phase (i.e., 0%–20% of trials within a given session).

Gabriela's parents are in frequent contact with the interventionists because they drop her off and pick her up from school each day. Her parents are informed verbally of the intervention procedures and results. Based on the data collected and conversations with her parents, Gabriela's team decide they will continue to teach her with both Spanish and English symbols, with the expectation that the English symbols will mainly be used in the school setting and the Spanish symbols will be used at home.

Conclusions

The steps for conducting FCT include conducting and interpreting an FBA, identifying the communicative replacement behavior(s), conducting FCT, and monitoring progress and making data-based decisions. Table 1 summarizes issues to consider when implementing these steps with AAC users who are English language learners. Among these issues are (a) conducting an FBA that includes collecting information on whether the individual responds similarly or differently in situations in which different languages are being employed; (b) identifying a communicative replacement behavior that includes consideration of the student's cognitive, physical, and sensory skills/abilities and cultural preferences and influences (e.g., parent/family preference); (c) using an alternating treatment design where interventionists alternate between conditions where instructional sessions are conducted in the learner's first and second language; (d) comparing data to see if there are differences in skill acquisition or challenging behavior in the learner's first and second language; and (e) examining language preference (after criterion is reached in each condition) by implementing several opportunities where both symbols are presented along with their verbal labels in both languages and allowing the AAC user to choose between symbols when communicating.

Table 1. Issues to consider when implementing functional communication training with augmentative and alternative communication (AAC) users who are English language learners.

Conduct and interpret the functional behavior assessment
✓ FBA is conducted via
▪ indirect assessments such as interviews, rating scales, or questionnaires,
▪ direct observation and data collection in settings/situations in which challenging behaviors are occurring, and/or
▪ functional analyses.
✓ The FBA allows the team to identify
▪ the range of challenging behaviors exhibited by the individual,
▪ the motivating operations and antecedent events that occur prior to challenging behaviors, and
▪ the consequences that are reinforcing and maintaining the behaviors.
✓ Information collected via the FBA is used to generate one or more summary statements or hypotheses that pull together the information to guide the selection of intervention strategies.
✓ The FBA process includes collecting information on whether the individual responds similarly or differently in situations in which different languages are being employed.

Identify the communicative replacement behavior(s)
✓ The communicative replacement behavior is identified with consideration of the child's cognitive, physical, and sensory skills/abilities and cultural preferences and influences (e.g., parent/family preference).
✓ The communicative replacement behavior is more efficient than the challenging behavior in terms of
▪ response effort,
▪ quality of reinforcement,
▪ immediacy of reinforcement, and/or
▪ rate of reinforcement.
✓ The form of the communicative replacement behavior is distinctly different from the challenging behavior.
✓ Communication partners will be able to recognize and respond to the communicative replacement behavior.
Conduct functional communication training in both languages
✓ The situations in which challenging behaviors typically occur are identified based on the FBA.
✓ Interventionists set up such situations and present typical antecedents that evoke challenging behavior.
✓ Prior to the occurrence of the challenging behavior, interventionists prompt the individual to engage in the alternative behavior.
✓ When using an alternating treatment design, the training involves teaching the symbols in both languages.
✓ When a symbol is selected, the relevant reinforcer (e.g., escape from the demand situation) is then provided.
✓ Data are examined by comparing differences in skill acquisition and occurrence of the challenging behavior in the learner's first and second language.
✓ After the AAC user reaches criterion in both languages, preference is examined by implementing several opportunities where both symbols are presented along with their verbal labels in each language and by allowing the AAC user to choose between symbols when communicating.
✓ Once an AAC user consistently demonstrates successful unprompted use of the alternative behavior, procedures are employed to gradually increase requirements before the alternative behavior is reinforced.
Monitor progress and make data-based decisions
✓ Data are collected on the occurrence of the alternative and challenging behaviors.
✓ Data are collected on the level of prompting being required (if any) for the alternative behavior.
✓ Data are summarized and reviewed on a frequent basis to determine if the unprompted alternative behavior is being successfully acquired and is being exhibited in place of the challenging behavior.

Note. FBA = functional behavior assessment.

These considerations are consistent with a set of standards for cultural competence for persons engaged in behavior analytic practice proposed by Fong and Tanaka (2013). Furthermore, they are consistent with the American Speech-Language-Hearing Association's summary of key considerations in bilingual service delivery (American Speech-Language-Hearing Association, 2018), particularly as it relates to an accurate differential diagnosis and intervention design (Centeno & Ansaldo, 2013).

The increased awareness of issues related to cultural competence has extended to the specific area of FCT with AAC users and their families for whom English is not a primary language. For example, Garcia, Bloom, Campos, Weyman, and Bell (2018) described an approach for culturally adapted FCT in which parental input was solicited regarding culturally relevant and culturally

nonrelevant functional communication responses (FCRs). Following the implementation of culturally relevant and nonrelevant FCRs, it was found that parents consistently choose to implement the culturally relevant FCR approach.

These converging trends from research and practice indicate that, in the process of FCT with AAC users and their families for whom English is not a primary language, a variety of intersecting factors must be considered. These include (a) the communication mode and specific response to be trained, which may involve parent/family cultural preferences; (b) the language(s) of the alternative response(s) to be trained; and (c) the types of persons with whom and settings in which the alternative response(s) will need to be used. These factors will help guide families and interventionists with regard to choosing the most relevant and efficient communicative replacement responses to focus on during training. Although there is a slowly increasing research literature in this area, additional research is needed to examine factors that will increase the effectiveness and efficiency of FCT with AAC users for whom English is not a primary language.

References

Aguilar, J. M., Chan, J. M., White, P., & Fragale, C. (2017). Assessment of language preferences of five children with autism from Spanish-speaking homes. *Journal of Behavioral Education, 26,* 334–347.

American Speech-Language-Hearing Association (2018). *Bilingual service delivery: Key issues*. Retrieved from https://www.asha.org/PRPSpecificTopic.aspx?folderid=8589935225&section=Key_Issues

Centeno, J. G., & Ansaldo, A. I. (2013). Aphasia in multilingual populations. In I. Papathanasiou, P. Coppens, & C. Potagas (Eds.), *Aphasia and related neurogenic communication disorders* (pp. 275–294). Boston, MA: Jones and Bartlett.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, NJ: Pearson.

Duran, L. K., Bloom, S. E., & Samaha, A. L. (2013). Adaptations to a functional behavior assessment with a Spanish-speaking preschooler: A data-based case study. *Education and Treatment of Children, 36*(1), 73–95.

Durand, V. M., & Crimmins, D. B. (2002). *The Motivation Assessment Scale–Second Edition* (MAT-2). Topeka, KS: Monaco & Associates.

Durand, V. M., & Moskowitz, L. (2015). Functional communication training: Thirty years of treating challenging behavior. *Topics in Early Childhood Special Education, 35*(2), 116–126.

Fong, E. H., & Tanaka, S. (2013). Multicultural alliance of behavior analysis standards for cultural competence in behavior analysis. *International Journal of Behavioral Consultation and Therapy, 8,* 17–19.

Garcia, A., Bloom, S. E., Campos, C., Weyman, J. R., & Bell, M. (2018, May). *Culturally adapted functional communication training*. Paper presented at the Association for Behavior Analysis International, San Diego, CA.

Iwata, B. A., DeLeon, I. G., & Roscoe, E. M. (2013). Reliability and validity of the functional analysis screening tool. *Journal of Applied Behavior Analysis, 46,* 271–284.

Johnston, S., Reichle, J., & Evans, J. (2004). Supporting augmentative and alternative communication use by beginning communicators with severe disabilities. *American Journal of Speech-Language Pathology, 13*(1), 20–30.

Kurtz, P. F., Boelter, E. W., Jarmolowicz, D. P., Chin, M. D., & Hagopian, L. P. (2011). An analysis of functional communication training as an empirically supported treatment for problem behavior displayed by individuals with intellectual disabilities. *Research in Developmental Disabilities, 32,* 2935–2942.

Matson, J. L., Tureck, K., & Rieske, R. (2012). The Questions About Behavioral Function Scale (QABF): Current status as a method of functional assessment. *Research in Developmental Disabilities*, *33,* 630–634.

McDonnell, J., Jameson, M., & Rose, T. (2011). Alternating treatment designs. In R. O'Neill, J. McDonnell, F. Billingsley, & W. Jensen (Eds.), *Single case research designs in educational and community settings* (pp. 151–169). Boston, MA: Pearson.

O'Neill, R. E., Albin, R. W., Storey, K., Horner, R. H., & Sprague, J. R. (2015). *Functional assessment and program development for problem behavior: A practical handbook*. (3rd ed.). New York, NY: Cengage Learning.

Padilla Dalmau, Y. C., Wacker, D., Harding, J. W., Berg, W. K., Schieltz, K. M., Lee, J. F., . . . Kramer, A. R. (2011). A preliminary evaluation of functional communication training effectiveness and language preferences when Spanish and English are manipulated. *Journal of Behavioral Education, 20*(4), 233–251.

Reichle, J., & Wacker, D. P. (2017). *Functional communication training for problem behavior*. New York, NY: Guilford.

Rispoli, M., O'Reilly, M., Lang, R., Sigafoos, J., Mulloy, A., Aguilar, J., & Singer, G. (2011). Effects of language of implementation on functional analysis outcomes. *Journal of Behavioral Education, 20,* 224–232.

Schuman, J., O'Neill, M., & Johnston, S. (2012). *A comparison of primary and secondary languages within functional communication training for preschoolers with disabilities who are English language learners*. Unpublished manuscript, University of Utah, Salt Lake City, UT.

Tiger, J. H., Hanley, G. P., & Bruzek, J. (2008). Functional communication training: A review and practical guide. *Behavior Analysis in Practice, 1*(1), 16–23.

Walker, V. L., & Snell, M. E. (2013). Effects of augmentative and alternative communication on challenging behavior: A meta-analysis. *Augmentative and Alternative Communication, 29*(2), 117–131.

Winborn-Kemmerer, L., Ringdahl, J. E., Wacker, D. P., & Kitsukawa, K. (2009). A demonstration of individual preference for novel mands during functional communication training. *Journal of Applied Behavior Analysis, 42,* 185–189.

History:
Received June 20, 2018
Revised August 29, 2018
Accepted September 13, 2018
https://doi.org/10.1044/persp3.SIG12.164