Cultural and Linguistic Diversity in Recent Verbal Behavior Research on Individuals with Disabilities: a Review and Implications for Research and Practice

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Abstract The number of individuals from various culture and language backgrounds who are receiving behavior-analytic services is growing. Therefore, a behavioral understanding of the role of cultural and linguistic diversity (CLD) in language acquisition may be warranted. We searched recent editions of *The Analysis of Verbal Behavior* and the *Journal of Applied Behavior Analysis* to determine the degree to which researchers report the CLD of individuals with disabilities who participate in verbal behavior research. Our results indicate that researchers in these journals rarely report the culture and language background of their participants. Given these results, we provide a conceptual analysis and describe implications for research and clinical practice. A further understanding of the role of CLD may aid in the development of better behavioral interventions and culturally sensitive treatments. Finally, research that explores the role of CLD in language acquisition may add to the generality of behavior-analytic research and practice.

Keywords Language · Verbal behavior · Diversity · *The Analysis of Verbal Behavior* · *Journal of Applied Behavior Analysis*

Since the publication of *Verbal Behavior* (Skinner 1957), researchers have conducted a number of studies that examine the application of Skinner's analysis of language in both theoretical and applied domains (see Sautter and LeBlanc 2006 and Grow and Kodak 2010 for reviews on verbal behavior research). Skinner's analysis has also sparked a number of extensions, such as Horne and Lowe's (1996, 1997) naming theory and Greer and Speckman's (2009) verbal development theory, that have developed into research lines. Skinner's analysis of verbal behavior and its extensions are useful in aiding in the acquisition of language in individuals with disabilities in both research (e.g., Betz et al. 2011) and clinical applications (e.g., Greer and Ross 2008; Frost and Bondy 2002; Sundberg and Partington 1998). In addition to verbal behavior, Relational Frame Theory (Hayes et al. 2001) has emerged as an extension of Skinner's analysis. This approach has slowly been translated from basic research (e.g., Murphy et al. 2005) into clinical practice (e.g., Rehfeldt and Barnes-Holmes 2009).

None of the frameworks we discussed above, however, includes a systematic evaluation of the role of cultural and linguistic diversity (CLD) in language acquisition research for individuals with disabilities. Given that CLD is a broad descriptor, it is helpful to first look at traditional behavior-analytic definitions of

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culture when examining CLD from a language acquisition perspective. Skinner (1953, 1971) defined culture as a set of behavioral contingencies that are arranged by other people. For example, an English-speaking culture has arranged conditions under which the vocal mand form “milk” results in access to milk. In a Spanish-speaking culture, the mand form *leche* results in the same reinforcement. In both cases, the reinforcement and motivational control (the conditions that make manding more probable) are similar. However, the response topographies are different as a result of the contingencies of reinforcement that are arranged by the specific verbal audience.

Skinner's (1953, 1971) treatment of culture provides a conceptual framework for analyzing complex environmental variables (e.g., social contingencies) while maintaining a behavior-analytic worldview. Sugai et al. (2012) extended this tradition with a contemporary definition of culture. They defined culture as “the extent to which a group of individuals engage in overt and verbal behavior reflecting shared behavioral learning histories, serving to differentiate the groups from other groups, and predicting how individuals within the group act in specific setting conditions” (p. 200). By this definition, cultures are social groups that are labeled based on the common learning histories of individuals within that culture. These differences allow us to distinguish cultures from one another. They also allow us to infer how individuals from that culture may behave based on an analysis of the social environment (see Skinner 1953).

From a behavior-analytic perspective, CLD refers to the social (cultural) differences between groups that may control verbal behavior. In other words, a difference in CLD between two individuals with disabilities indicates distinguishable differences at the third level of selection, “the special contingencies maintained by an evolved social environment” (Skinner 1981, p. 502). CLD refers to instances when individuals from one social group have different cultural expectations (contingency arrangements) and, as a result, reinforce different response forms (verbal topographies) than individuals from another social group. The degree of differential selection may vary depending on relevant differences between the cultures of interest. For example, differential selection between European-American and British cultures may not be as obvious as differential selection between Spanish and Tongan cultures. Also, the degree of differential selection may vary on the type of relevant contingencies, ranging from direct-acting (immediate) contingencies to

indirect-acting (delayed) contingencies of reinforcement (see Weatherly and Malott 2008). In any case, because of these social arrangements, cultures differentially select and control verbal behavior. In this review, we are particularly interested in the different cultural variables that differentially affect language acquisition in individuals with disabilities.

It is important to note that Skinner (1981) described culture as a critical, yet not fully understood, feature of selection by consequence. He also noted “the effect of a social environment upon behavior of an individual may be inferred point for point from an analysis of that environment” (Skinner 1953, p. 422). Although an analysis of social variables may be complex, the utility of such an analysis may be important in advancing our behavior-analytic understanding of the third level of selection (i.e., culture) and furthering the ability of behavior analysis to understand complex differences between cultures and languages. Ultimately, this may lead to a better understanding of how to enhance verbal outcomes for individuals with disabilities from diverse social backgrounds.

As behavior analysts continue to develop an understanding of how social contingencies (i.e., culture) control language acquisition in individuals with disabilities, they can further explain the role of culture as the third level of selection by consequence (Skinner 1981). As we mentioned, Skinner described the third level of selection as an important, yet ignored, concept. Obviously, selection at the cultural level is a difficult unit of analysis, but the more information we gather about how different languages develop within specific cultures, the more informed our inferences become. Ultimately, these inferences may allow us to test research hypotheses that address these important questions in a more controlled research environment. For example, by advancing our behavior-analytic understanding of cultural contingencies, behavior analysts may be in a better position to examine and analyze how an individual may adapt, or fail to adapt, when they are faced with two or more sets of social rules (such as dominant cultural rules and traditional cultural rules; see our treatment of acculturation below). As behavior analysts begin to serve more clients from a diverse range of cultural and linguistic backgrounds, these types of analyses may become valuable to maximize outcomes for their clientele.

One analysis that may lead to a better understanding of the third level of selection is to consider the role of

multiple control in verbal behavior from a CLD perspective. Skinner's (1957) analysis of multiple control is relevant to CLD because cultural and language variables play an obvious role in controlling verbal behavior. For example, a bilingual speaker may engage in the vocal mand form "I would like coffee, please" while under the control of a relevant establishing operation and critical features of the verbal audience. This critical feature may be the speaker's past history with the audience member, and, as a result, the audience member functions as a discriminative stimulus for English mand forms. It may also be the case that the speaker does not have a past history with the audience member, but the audience member recently engaged in English vocal-verbal behavior that functioned as a discriminative stimulus, signaling that an English mand will likely be reinforced. In the case that the speaker engages in the mand form *Quiero café por favor*, the speaker's history with the audience member or recently hearing the audience member engage in Spanish vocal-verbal behavior is likely to control the Spanish mand form (in addition to the relevant motivational variables).

The language spoken and past history with a specific audience member are only a few examples of environmental conditions that control verbal behavior. Other variables may include culture-specific clothing, foods, other common household items, and overt nonverbal behavior (e.g., gestures). For individuals with disabilities who are learning either a first or second language, these may be important considerations because they may determine whether or not individuals can reliably interact meaningfully with their verbal communities. Assessments that consider these variables may help identify the repertoire an individual has at the onset of intervention. Ultimately, information obtained from these assessments would guide treatment decisions and aid in the development of a more functional and comprehensive verbal repertoire.

A behavior-analytic understanding of CLD in individuals with disabilities may also be important because, as of 2000, the majority of urban schools in the USA had a diverse student body, with more than 75 % of students coming from non-European-American backgrounds and speaking languages other than English at home (Coutinho and Oswald 2006). By 2050, nearly one out of five Americans will be immigrants, and Whites of non-Hispanic origin will be a minority population (Passel and Cohn 2008). The population as a whole is becoming more culturally and linguistically diverse,

making now an appropriate time to begin to understand cultural and linguistic diversity and its potential impact on our services.

Though researchers have not conducted a systematic evaluation of the role of CLD in language acquisition research on individuals with disabilities, recent publications in the area of second language acquisition (e.g., Houmanfar et al. 2005; Washio and Houmanfar 2007) and a special edition of the *Journal of Behavioral Education* (McComas 2011) have addressed this topic. This emerging interest in the role of culture and the specific language or languages being learned in language acquisition makes a systematic review a timely and appropriate course for furthering the understanding of the role of CLD in language acquisition. An understanding of these differences may allow behavior analysts to tailor approaches to individuals from certain cultural or linguistic backgrounds so as to maximize outcomes.

The goal of this quantitative review was to examine the extent to which researchers report the cultural and linguistic backgrounds of participants with disabilities in the language verbal behavior literature. The review focused specifically on participants with disabilities given the weighted focus of language acquisition research on individuals with disabilities in our field (see Marcon-Dawson et al. 2009).

We examined whether or not authors described the cultural or linguistic background of the participants in their studies. We also provided a conceptual analysis of the importance of CLD and recommendations and considerations for future research and clinical practice in this area.

Method

General Procedures

We searched *The Journal of Applied Behavior Analysis* (JABA) and *The Analysis of Verbal Behavior* (TAVB) to examine reported culture and language backgrounds in behavior-analytic language acquisition research between 2000 and 2011. We chose JABA and TAVB because they represent the largest sample of behavior-analytic research on language acquisition.

We performed a keyword search of JABA in Academic Search Premier using the EBSCOhost search engine. We set restrictions for each search to include articles from January 2000 through October 2011 using

the following keywords: (a) mand, (b) tact, (c) echoic, (d) autoclitic, (e) intraverbal, (f) verbal behavior, (g) relational frame theory, (h) relational responding, (i) language acquisition, and (j) communication. This search resulted in 135 articles from JABA. We performed a hand search of TAVB from 2000 through 2011. The hand search consisted of looking at each article in each edition of TAVB and marking whether or not it met inclusion criteria (see below).

Once we identified potential articles using the procedures described above, we applied two main inclusion criteria to examine reported ethnic background and language diversity in the recent language acquisition research. First, the article reported language acquisition data (this includes any report with data on the acquisition of vocal or nonvocal communication of some form; we did not include systematic reviews) in the text, figure, or table. Second, the article had to include at least one participant with a disability or at risk of developing a disability (we defined disability as any impairment, or risk of an impairment, that may affect the participant's ability to acquire language). We chose to review language acquisition research on individuals with disabilities because culture and language background may have the most important and direct impact on our field, as we are often involved in developing interventions to facilitate language acquisition in individuals with disabilities (Goldstein 2012; Paradis et al. 2011).

Sixty-three articles from JABA and 40 articles from TAVB met inclusion criteria for further analysis, for a total of 103 articles. The first author reviewed the *participants* section of the report and recorded the number of participants with disabilities for each article. The first author also recorded the culture and language backgrounds and descriptors of the participants. We defined cultural descriptors as any mention of the participant's ethnic heritage (e.g., Caucasian, African-American, or Hispanic). We defined language descriptors as any instance of labeling the primary or secondary language of the participants. Descriptions of where the study was located did not count as a description of culture and/or language background (e.g., Ribeiro et al. 2010) because it did not identify the specific culture and language background for each participant.

Reliability We assigned each article that met inclusion criteria a number. We then used a random number generator to determine which articles an independent observer would code. The third author coded 20 articles from JABA (31.25 % of the articles) and 11 articles

from TAVB (32.35 % of the articles) for the number of participants with disabilities and their culture and language backgrounds. The third author also coded the articles that mentioned culture or language backgrounds for agreement on the specific disabilities of the research participants in those studies. We calculated the reliability of the observation system by dividing the number of agreements by the sum of agreements and disagreements (Cooper et al. 2007). We obtained 100 % agreement between the two observers for the number of participants with disabilities, their culture and language backgrounds, and the specific disabilities of participants with culture or language descriptors.

Results

Table 1 lists the articles that met the inclusion criteria. The table also contains information about the number of participants in each article, their reported culture and language backgrounds (if applicable), and their reported disabilities. Of the articles that met inclusion criteria, we coded 63 articles from JABA and 40 articles from TAVB to examine the reported language and cultural representation in recent language acquisition research. In JABA, six articles (6 %; Charlop-Christy et al. 2002; Chaabane et al. 2009; Daly et al. 2006; Ingvarsson and Hollobaugh 2010; Pelaez et al. 2011; Williams et al. 2003) included cultural descriptors (e.g., Ethiopian-American, Chinese-American, and Korean-American participants; Charlop-Christy et al. 2002), and one article (1 %; Williams et al.) included information about language background (e.g., English or Spanish language backgrounds). In TAVB, three articles (3 %; Yi et al. 2006; Emmick et al. 2010; Ingvarsson and Le 2011) included cultural descriptors (e.g., Iranian-American and Caucasian participants; Yi et al. 2006), and we did not find any articles that included information about language background.

Of the nine articles with cultural and/or language descriptors, 21 participants had a diagnosis of autism (63 %; e.g., Charlop-Christy et al. 2002), whereas other articles reported those at risk for developmental delays (11 participants; 33 %; Pelaez et al. 2011), individuals with referrals for reading problems (three participants; 9 %; Daly et al. 2006), and an individual with Down syndrome (3 %; Emmick et al. 2010). Of the 300 participants in the 103 studies that met inclusion criteria, the articles reported cultural background for 33 of those participants (11 %) and language background for three participants (1 %).

Table 1 The distribution of participants with cultural and language descriptors and their disabilities

Article	Participants	Culture	Language	Disability
Chaabane et al. (2009)	2	Implied Caucasian	N/A	Autism ^a
Charlop-Christy et al. (2002)	3	Ethiopian-American Chinese-American Korean-American	N/A	Autism
Daly et al. (2006)	3	Kurdish Hispanic Hispanic	N/A	Referral for reading problems
Emmick et al. (2010)	3	Caucasian Caucasian Caucasian	N/A	Autism Down syndrome Autism
Ingvarsson et al. (2010)	4	Caucasian Caucasian Caucasian African-American	N/A	Autism
Ingvarsson and Le (2011)	4	Caucasian Caucasian Caucasian African-American	N/A	Autism
Pelaez et al. (2011)	11	Caucasian African-American and Hispanic descent ^b	N/A	At risk for developmental disabilities
Williams et al. (2003)	3	Resident of the USA Resident of the USA Resident of Spain	English ^c English ^c Spanish ^c	Autism
Yi et al. (2006)	3	Iranian-American Caucasian Caucasian	N/A	Autism

^a All participants have the same disability unless otherwise noted

^b Article did not report information about specific representation from each culture

^c Language background is indirectly implied

Between the articles in JABA and TAVB with culture or language descriptors for participants, Caucasian (13 participants; 36 %; e.g., Emmick et al. 2010) was the most commonly reported cultural background. Those from Hispanic descent (two participants; 5 %; e.g., Daly et al. 2006) were the second most commonly reported cultural background. Two African-American participants were also represented (5 %; e.g., Ingvarsson and Hollobaugh 2010). Ethiopian-American, Chinese-American, Korean-American, and Iranian-American backgrounds were each represented by a single participant (3 % for each culture; Charlop-Christy et al. 2002; Yi et al. 2006). Palaez et al. (2011) listed 11 participants as being of Caucasian, African-American, and Hispanic descent, so we could not determine the exact number of

participants represented from each of these backgrounds. Williams et al. (2003) listed two participants (6 %) as US residents and one participant (3 %) as a resident of Spain, but we could not determine their specific cultural background given only their current residency. This same article gave indirect information about language background (i.e., the participant is from Spain; therefore, instruction was given in Spanish).

Discussion

The results of this review indicate that culture and language backgrounds are rarely reported in the recent behavior-analytic language acquisition literature in the

journals we examined. Of the 103 articles that met inclusion criteria for review, nine studies listed cultural backgrounds of their participants (e.g., Ingvarsson and Hollobaugh 2010; Pelaez et al. 2011), and only one study (Williams et al. 2003) listed the language background of the participants. Below, we describe how and why behavior analysts may wish to consider including descriptions of the cultural and linguistic backgrounds of the participants. We also discuss possible implications for research and clinical practice.

Reporting Culture and Language Backgrounds

Our primary recommendation based on our findings is that behavior analysts may consider reporting the culture and language background of their research participants more consistently. For example, “Mariela’s parents are from Mexico, and Spanish is the primary language in her home” is a complete description of the cultural and linguistic features of an individual participant that may be relevant to the language intervention they are receiving (below, we discuss these features in our recommendation for clinical practice). We urge journals such as JABA, TAVB, and others to consider encouraging CLD descriptions regardless of the type of article (e.g., a report or research article). If the author has limited space in the article, they might consider including a statement noting that this information is available upon request.

There are many justifiable concerns researchers may have when considering the above recommendation. For example, researchers may wish to avoid seeming redundant and not report CLD unless participants come from “non-White” backgrounds or there is diversity in the research sample. For example, Charlop-Christy et al. (2002) had three participants in their study who were from Ethiopian-American, Chinese-American, and Korean-American backgrounds; therefore, it may seem reasonable to report these differences. However, Ingvarsson and Le (2011) reported four participants from the same cultural background (Caucasian). Given the differences we found in our review, we cannot be sure that the absence of CLD information in the participant description indicates Caucasian, English-speaking status. Because of these differences, we recommend that behavior analysts consider noting the culture and language background of all of their participants.

It may be the case that descriptions of culture and language backgrounds provide identifiable information

about research participants that may compromise participant confidentiality. For example, a participant description may read “Jeremy is a four-year-old with cerebral palsy from Ethiopia. His parents speak Amharic at home and he is learning English as a second language.” This statement, combined with information concerning author affiliation and location, may provide readers with enough information to identify a research participant. This risk may become elevated if the participant is from a rural area. To mitigate the issue of loss of confidentiality, researchers may include a statement in their informed consent documents that permits them to share this information. If the individual providing consent is uncomfortable with making this information available, the researcher can honor that request.

It is worth noting that, during our search, we found a few instances that resembled desirable descriptions of language backgrounds. However, these studies did not meet inclusion criteria because they did not include a participant with a disability. For example, Luke et al. (2011) described a group of participants as “typically developing and... bilingual. These children were all members of a group of children defined as *dual language learners*” (p. 150). A study by Rosales et al. (2011) listed “four typically developing children, aged 3 years... [who] were recruited from a local Head Start Program. All participants’ first language was Spanish” (p. 63). Although the purpose of the Rosales et al. study was to test the effects of multiple exemplar training on the emergence of derived relations in preschool children learning a second language, it stands out as an example of how behavior analysts could begin to describe language backgrounds in all cases.

Unless the researchers explicitly state the culture and language backgrounds of each participant, we cannot be sure what those language backgrounds are. Some researchers may provide geographical information (e.g., where they conducted the study) that serves as a clue to the possible language and culture backgrounds of the participants. For example, Ribeiro et al. (2010) reported that research participants “attended a special education school in the state of São Paulo, Brazil” (p. 66). It is likely that these participants are Brazilian and speak Portuguese as their primary language, but we do not know for sure because those backgrounds were not explicitly stated. Unless researchers specify the culture and language background of each research participant, we cannot make assumptions about what those backgrounds may be.

However, we recommend caution when interpreting culture and language backgrounds as the only variables that are responsible for the results of the experimental arrangement. Just as demographic variables are not attributed causal status, we caution against attributing performance to culture or language backgrounds unless the research question specifically addresses the role of culture and/or language. However, it would be important to emphasize that culture and language backgrounds, the third level of selection (Skinner 1981), may influence environmental events such as motivating operations (e.g., holidays), discriminative stimuli (e.g., members of different verbal audiences), and reinforcers (e.g., forms of social approval). Inferring the learning history of the individual may inform research or clinical practice, given that researchers collect enough information. As we mentioned earlier, Skinner (1953) noted that “the effect of a social environment upon the behavior of the individual may be inferred point for point from an analysis of that environment” (p. 422). We interpret this as an invitation to begin to collect information about the culture and language backgrounds of our research participants in order to piece together an understanding of the possible environmental events that control behavior at the third level of selection (see Skinner 1981). It may be the case that having information about individuals from various culture and language backgrounds and how they respond to various treatments may allow behavior analysts to *infer* the *possible* effects of the environment. Although this inference may not be absolute in the sense that it provides an ultimate behavioral solution, it may at least inform treatment decisions and provide a foundation for future research.

Implications for Research

To start, we encourage researchers to extend their work cross-culturally and cross-linguistically in order to enhance the generality of behavior-analytic research. That is, when researchers replicate and extend single-subject research with individuals from various culture and language backgrounds, it strengthens empirical support for treatments for a given population. This type of research replication is similar to replications across disabilities, for example.

Though individuals interested in verbal behavior may find single-subject designs to be appropriate for answering their research questions, group designs may be used to inform future single-subject research. For

example, according to a group design study, in Spanish, there is greater emphasis on verbs rather than nouns, and Spanish-speaking children tend to identify the function of an object before acquiring the names of the nouns of those objects (Peña et al. 2003). In another example, researchers demonstrated that a family’s culture guides child rearing, which directly influences the interaction patterns, activities, and opportunities provided for early language acquisition (Hammer and Rodriguez 2012; Peña et al. 2012). Finally, researchers found that the language of instruction can influence outcomes related to vocabulary acquisition (Farver et al. 2009; Lugo-Neris et al. 2010). This finding is convergent with a growing body of preschool research investigating the effects of the language of instruction on child language and literacy outcomes in English and Spanish (Barnett et al. 2007; Durán et al. 2010, 2013).

The above examples illustrate findings from group design research that suggest CLD plays a role in language acquisition. Verbal behavior researchers may wish to consider these studies as they design single-subject research on the role of culture and languages spoken in the environment on language acquisition. To demonstrate how researchers may do this, we describe some related research that has begun to address the roles of culture and language background in the analysis and treatment of problem behavior. Rispoli et al. (2011) examined the effects of English versus Spanish instruction on the outcomes of a functional analysis. They concluded that the language used during functional analysis conditions might influence the validity of the results as well as treatments based on those results. In another example, Padilla Dalmau et al. (2011) evaluated the effectiveness of and preference for treatment of problem behavior using functional communication training (FCT) in English and Spanish for two participants. FCT reduced challenging behavior in both participants, and the participants did not demonstrate a marked preference for Spanish or English mands. Padilla Dalmau et al. noted that, though the intervention effectiveness was the same for both English and Spanish mands, cultural and linguistic factors might influence results due to response effort and treatment preference. That is, researchers may examine response form preference when the probability of reinforcement from different verbal communities (e.g., English and Spanish speaking) is less than 100 %.

However, Padilla Dalmau et al. (2011) evaluated preference only in a context in which both responses

(Spanish and English) were reinforced and of equal response effort. It is possible that, in the case of the household in which Spanish was the primary language, a Spanish mand would be reinforced, whereas an English mand would not. The effectiveness of the response along with the effort of the response may influence preference (i.e., a Spanish mand may be preferred by a Spanish-speaking child because it requires less response effort than a mand in an unfamiliar language). Researchers may wish to examine response preference under conditions where reinforcement for a specific response form is not likely to occur.

Behavior analysts may also develop research preparations that assess linguistically appropriate targets of language acquisition interventions. As we mentioned earlier, group design research has found that given their linguistic structure, Spanish verbs may be more salient intervention targets than nouns (Peña et al. 2003). For example, in Spanish, the subject of the sentence is most often conjugated into the verb ('I eat' becomes *como*). Therefore, verbs play a more prominent role in Spanish grammar because they often include both the subject and the action. Researchers may assess the sequence of development in different languages in which they teach children (nouns vs. verbs) to empirically validate and understand this cultural and linguistic difference.

Researchers may also examine whether or not culturally relevant treatments are implemented with more fidelity than treatments that are culturally irrelevant or are inappropriate within a particular cultural context. This leads to a possibly more fundamental question: What behavior-analytic approaches to language acquisition are acceptable across cultures (e.g., discrete trial teaching vs. naturalistic instruction)? If some practices are not acceptable, what changes can be made that make them acceptable and do not degrade the quality of that intervention? With the increase in diversity in the USA, we feel these may be important research questions to address.

Earlier, we addressed the issue of multiple control in verbal behavior. Researchers may examine what types of teaching strategies are useful in teaching individuals with disabilities to respond to relevant environmental stimuli. For example, a researcher could contrive settings in which they teach an individual to engage in English vocal-verbal behavior in the presence of other English language speakers and Spanish vocal-verbal behavior in the presence of Spanish speakers. That is, after an audience member engages in a specific mand

form (either in English or Spanish), that vocal response can serve as a discriminative stimulus for a response form in the same language category. Researchers may find other cultural variables more interesting (such as differences in clothing or overt, nonverbal behavior) and examine how to arrange conditions to teach an individual to differentially select verbal behavior based on these variables. See Washio and Houmanfar (2007) for an example of behavior-analytic work in this area.

Another area behavior analysts may explore is the effects of disability on dual language learning. Aside from children with Down syndrome, little is known about how disability affects the acquisition of a second language (Paradis, et al. 2011). Behavior analysts have conducted a number of studies on the language acquisition of children with disabilities (see Sautter and LeBlanc 2006; Grow and Kodak 2010 for reviews), so there is considerable potential for behavior analysts to advance the understanding of dual language development and for studying other culture and language variables that may influence verbal behavior and dual language learning.

Finally, behavior analysts may wish to explore the role of acculturation in language acquisition. Acculturation refers to "a multidimensional process consisting of the confluence among heritage-cultural and receiving-cultural practices, values, and identities" (Schwartz et al. 2010; see Padilla and Perez 2003 for additional definitions of acculturation). From a behavior-analytic perspective, we interpret this definition as the complex interaction of cultural variables (i.e., the third level of selection) between two cultures (verbal communities) experienced by an individual. These interactions include differences in rule-governed behavior that is promoted by both communities, reinforcers (values), and individual behavior that represents commonalities each community.

For example, individuals from different geographical areas (Puerto Rico and Spain) may both speak Spanish, but their cultural practices may be entirely different. Behavior analysts may wish to explore the processes that aid in acculturation by examining strategies to help individuals respond appropriately to different verbal audiences, cultural rules, and social norms. The goal of this is not to assimilate individuals into a specific culture. Instead, behavior analysts may wish to examine teaching strategies to improve adaptation to a novel culture while helping individuals maintain their original cultural practices. As we mentioned earlier, there is a

growing need for an understanding of cultural differences, given the shifting demographics in the USA. Conducting research in this area may help provide clinicians with the skills necessary to meet this growing demand.

The studies we suggest involve making generalizations, to some degree, of a culture. For obvious reasons, making gross generalizations about a cultural group is inappropriate. Also, one may argue that there are too many idiosyncrasies in a given population, especially with individuals with disabilities, to assume generality of findings across culture and language backgrounds. However, research on individuals with autism, for example, is a subset of disability study that provides readers with an empirical foundation for treatment programs and future research questions for this specific population. A further subset of this body of research on individuals with autism from Latino backgrounds, for example, may provide scientists and practitioners a similar empirical basis for making treatment decisions and conducting research in this area.

Generality of results is one of the many reasons why the American Psychological Association (APA) recommends in their publication manual that researchers provide a detailed description of research participants. According to the APA, “appropriate identification of research participants is critical to the science and practice of psychology, particularly for generalizing the findings, making comparisons across replications, and using the evidence in research syntheses and secondary data analysis” (2010, p. 29). Thus, we encourage behavior analysts to follow the suggestions of the APA in order to enhance the replication and generality of findings of behavior-analytic research.

Clinical Implications

We recommend that behavior analysts continue to consider the importance of caretaker preference. The following example highlights this point. Hammer and Rodriguez (2012) noted that among Mexican Americans, the perceived role parents have in influencing child development may vary greatly between subcultural groups. When designing a home-based intervention, this may be an important dimension to consider, because it may mean the difference between designing a parent-based home intervention or an intervention that is implemented by individuals employed by an agency.

Hammer and Rodriguez (2012) also recommended that service providers consider whether individuals come from a collectivist or individualist culture. The difference between collectivism and individualism may dictate if parents prefer that students learn by participating in communal activities or learn through didactic instruction and explicit rule statements, respectively. In any case, we recommend that the behavior analyst consider these components and review the content and the approach of the behavioral intervention with the caretaker before designing and implementing the intervention.

In another example, behavior analysts may consider whether or not the form of reinforcement they provide to the student is culturally appropriate. For example, some cultures may value physical touch as an appropriate way to praise a student. In other cases, physical touch may be inappropriate. In order to accommodate cultural preferences for a specific teaching style, behavior analysts may consider modifying components of their teaching strategies to accommodate such differences in the classroom. We are not suggesting that behavior analysts abandon effective teaching strategies. Instead, the behavior analyst should ask, “What is the overall goal of this teaching component?” If they can make a culturally appropriate modification to that teaching component without losing sight of that goal, the modification seems reasonable, especially if it will increase the likelihood of implementation. In the end, we suggest that behavior analysts consider making possible accommodations for individuals from diverse backgrounds in order to meet their cultural needs.

We also recommend that behavior analysts consider the notion of multiple control of verbal behavior (see Skinner 1957) when providing clinical services. For example, the behavior analyst may consider the individuals the client is likely to encounter in his/her daily activities. If these encounters require response topographies from various languages (i.e., Hmong at home and English at school), the behavior analyst should consider establishing relevant conditional discriminations to increase the likelihood of the speaker contacting reinforcement in their natural environment.

Limitations

There are limitations to this paper that merit consideration. First, our search only consisted of two journals. There are other journals that publish behavioral research

(e.g., *Research in Developmental Disabilities and Behavior Analysis in Practice*) that may report the culture and language background of research participants. Second, we limited our search and suggestions to language acquisition research on individuals with disabilities. Behavior analysts may wish to experimentally explore the roles of culture and language in typically developing individuals from a behavior-analytic perspective in future reviews. Future researchers may also wish to examine the role of culture and language in stimulus equivalence tasks, treatment preference arrangements, and function-based treatments, to name a few additional areas. Also, this paper does not examine the effects of socioeconomic status (SES) on language acquisition in individuals with disabilities. Future research may wish to examine the similarities and differences between CLD and SES and how SES may interact with language acquisition from a behavior-analytic perspective.

Summary

We hope behavior analysts consider the importance of understanding the role of culture and language backgrounds in language acquisition. To date, the Association for Behavior Analysis has published position statements on effective treatment (Van Houten et al. 1988) and effective education (Barrett et al. 1991), among others. Though the role CLD plays in language acquisition research is not well understood, future researchers may generate data that help guide decisions regarding guidelines and policies related to CLD. These policies may encourage behavior analysts to incorporate CLD variables in language acquisition research and consider CLD as a general topic of interest in behavior-analytic research and practice.

Given the results of our quantitative review, behavior analysts rarely report the culture and language backgrounds of the participants in verbal behavior research. We hope behavior analysts see the importance in reporting the culture and language background of their research participants. As mentioned in the *APA Publication Manual* (2009), this information is “important for understanding the nature of the sample and the degree to which the results can be generalized” (p. 29–30). With this information, behavior analysts may replicate and extend research across cultural and/or linguistic groups. Ultimately, replications and extensions across cultural

and/or linguistic groups may expand the generality of behavior-analytic research and assessments.

In *The Guidelines for Responsible Conduct for Behavior Analysts* (Behavior Analyst Certification Board 2010), Section 1.05c notes that when providing services to individuals from various culture or language backgrounds, behavior analysts obtain “training, experience, consultation, or supervision necessary to ensure competence in their services” (p. 2). A behavior-analytic understanding of CLD may help clinicians and researchers obtain competence in working with individuals from various culture and language backgrounds. We urge clinical organizations to consider the importance of this guideline by providing training and supervision to maintain high standards in ethical behavior, especially behavior related to serving culturally and linguistically diverse populations (see Brodhead and Higbee 2012 for further suggestions on maintaining ethical behavior in a clinical organization).

Whether a behavior analyst is conducting language acquisition research or providing clinical services to individuals with disabilities, culture and language backgrounds may play an important role in the analysis of human behavior. As Skinner (1981) mentioned, cultural variables play an important, yet ignored, role in the differential selection of human behavior. We hope our paper explained the importance of analyzing culture and language variables at the third level of selection and how this analysis may continue to expand the generality of behavior analysis.

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