

Running head: IMPROVING TRANSLATION OF BEHAVIOR ANALYTIC JARGON

IMPROVING TRANSLATION OF BEHAVIOR ANALYTIC JARGON FROM
ENGLISH TO SPANISH

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IMPROVING TRANSLATION OF BEHAVIOR ANALYTIC JARGON

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Abstract

Healthcare professionals are legally obligated to provide interpretation services to people with limited English-speaking proficiency (Chen, Youdelman, & Brooks, 2007). While interpretation services certainly aid in communication between people who speak different languages, the task becomes more complicated when an additional specialized vocabulary is utilized, such as healthcare terminology that is not considered everyday language. For example, in the field of autism treatment, interpreters may be asked to translate terms within applied behavior analysis (ABA). Current literature has demonstrated that interpreters make frequent errors related to specialized vocabulary that can significantly impact treatment (Anazawa, Ishkawa, & Kiuchi, 2012; Baker, Hayes, & Fortier, 1998; Flores et al., 2003; Searight & Searight, 2009). However, there has been little investigation into methods to improve interpretation. The few studies that do exist suggest time-consuming and expensive interventions (Acosta & Christo, 1982; Beeber, Lewis, Cooper, Maxwell, & Sandelowski, 2009; Bergunde & Pollabauer, 2019). The present study aimed to assess the effectiveness of a brief, low-cost intervention to improve the accuracy of translation of ABA terminology, or jargon, from English to Spanish. Three participants were asked to translate vignettes that included ten ABA terms, before and after they were provided with a brief Spanish glossary of ABA terms. Results indicated that the intervention significantly improved participants' interpretation accuracy. The results of this study address current gaps in the literature and provide an alternative to current interventions that may potentially be effective with both professional and ad hoc interpreters.

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Introduction

As the United States minority populations continue to grow (Cohn & Caumont, 2016), the importance of cultural competence is becoming increasingly salient in providing health services. Cultural competence requires that one be knowledgeable about how to best serve people from diverse religious, racial, linguistic, and ethnic backgrounds (Bentacourt, Green, Carillo, & Ananeh-Firempong, 2003). These differences can create barriers to receiving health services if there are not enough providers that are culturally competent in treating people from varying backgrounds. The lack of culturally competent professionals impacts minority groups in their ability to access services, especially at the same quality as those received by non-minority groups (Egede, 2006). For example, minority groups are significantly less likely to receive health services, such as treatment for behavioral disorders, than are non-minority groups (St. John, 2016).

Cultural sensitivity is of paramount importance in the treatment of individuals with autism spectrum disorder (ASD). Autism spectrum disorder is a neurodevelopmental disorder that affects 1 in every 59 children (Baio, Wiggins, & Christensen, 2018). While there are evidence-based treatments available to treat ASD, the healthcare disparity remains for those in need of services. For example, it is challenging for people from minority backgrounds, particularly those who do not speak English, to receive adequate healthcare (Watts et al., 2016). By law, interpreters are required when health professions cannot provide care in the patients' native language (Chen, Youdelman, & Brooks, 2007); however, the quality of interpretation services may be poor if the translations of terminology for the treatment is only rudimentary. If translators are not trained in jargon specific to healthcare, errors in translations can lead to

misinterpretations that negatively impact treatment. This may especially be the case in the use of applied behavior analysis (ABA) for the treatment of ASD.

ABA has been shown to be effective in reducing the economic costs and symptoms of ASD (Chasson, Harris, & Neely, 2007). For some minority communities, however, obstacles to receiving this service have been insurmountable. Specifically, ABA has encountered challenges in reaching many Latino groups as terminology was not formally defined in Spanish until the translation of the textbook, *Applied Behavior Analysis* (Cooper, Heron, & Heward, 1987), in 2014. Due to this, there remains a gap in the literature on how to improve the translation of ABA terms from English to Spanish in healthcare with interpreters.

The purpose of this current study is to assess the effectiveness of a brief intervention on improving the translation of behavior analytic terminology from English to Spanish. To that end, I will first discuss the importance of best practice implementation of ABA to achieve desired clinical outcomes. Next, I will highlight the barriers to best practice that many people experience, particularly underserved minority groups. Finally, I will describe the intervention and its goals.

ASD and ABA

ASD is characterized by deficits in social communication and restricted interests and repetitive behaviors (American Psychiatric Association, 2013). The manifestation of social communication problems ranges from being unable to produce vocal speech to having difficulty reading social cues. People with ASD demonstrate delays in or absence of social skills, such as looking people in the eye and having reciprocal conversations. Restricted interests can make it difficult for people on the spectrum to demonstrate an interest in other people or activities; they

may wish to discuss only one subject or participate in only one activity for hours. Repetitive behaviors can include rocking, flapping hands, tapping, as well as other stereotypic actions. Additionally, people with ASD can engage in challenging behaviors, such as aggressing towards others or injuring themselves (American Psychiatric Association, 2013).

The symptoms of ASD can negatively impact social and daily living skills, as they make it more challenging for individuals to form meaningful relationships and reach independent functioning. This means that people with ASD often require some supports for significant portions of their lives, and some require substantial support for their entire lives (Dudley & Emory, 2014). Supports can include job coaching, behavioral aids, therapies, and housing. Economically, the cost of raising a child with autism costs over \$17,000 more per year than raising a typically developing child (Lavelle et al., 2014).

The cost of raising a child with ASD can be significantly defrayed by effective treatment. The cost savings of early behavior intervention, including ABA, has been estimated between \$187,000 and \$1,082,000 over the course of one's lifetime (Jacobson, Mulick, & Green, 1998). ABA is an evidence-based treatment that uses the principles of learning to create socially meaningful change (Cooper, Heron, & Heward, 2007). When providing therapy for learners on the autism spectrum, a board certified behavior analyst (BCBA) utilizes evidence-based teaching strategies to address individualized goals. Lovaas (1987) found that 40% of children with autism who participated in ABA treatment evidenced typical intellectual ability after about 24 months of treatment while only 2% of children with autism who did not receive the treatment were able to achieve the same level of intellectual functioning.

ABA targets reduction in problematic behaviors (e.g., self-injurious behavior) and acquisition of important life skills (Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2013;

Pace, Iwata, Edwards & McCosh, 1986). It can be utilized to improve social skills, such as appropriate eye contact, sharing, and taking turns in conversation (Reichow & Volkmar, 2010). While ABA is effective in creating significant behavioral change across a multitude of disorders (Embry, 2002; Flood, Wilder, Flood, & Masuda, 2002; Resinger, 1972), it is commonly referenced when discussing the treatment of individuals with ASD. This may be because it has a larger body of evidence in support of its use in treating individuals with ASD than do other interventions (Walsh, 2011).

Best practice ABA integrates families into treatment. Including families in treatment helps the learner generalize skills and behaviors across settings because it gives family members the ability to implement treatment whenever appropriate, such as in the home or out in the community. Additionally, inclusion of the family in treatment can aid in maintaining the consistency of therapy programs between home and school settings. Bearss and colleagues (2015) found that parent training in ABA led to a greater reduction in their child's problem behavior than did parent education alone. Moreover, research has demonstrated an increase in skill acquisition when parent training is implemented (Harris, Noyes, Crowe, & Chaudhry, 1983; Howlin, Marchant, & Rutter, 1973).

Significantly, parents have reported greater empowerment and less distress after receiving training in ABA approaches such as pivotal response training (PRT; Minjarez, Mercier, Williams, & Hardan, 2012). Parents of children with autism often experience higher levels of stress than parents of children with other developmental disabilities and typically developing children (Dunn, Burbine, Bowers, & Tantleff-Dunn, 2001). This stress likely contributes to the elevated levels of depression and anxiety that mothers of children with autism experience (Bitsika & Sharpley, 2004). Fortunately, studies have demonstrated that parent training can

improve mental health (Bristol, Gallagher, & Holt, 1993). Due to the many benefits that ABA can provide to families, it is imperative that parents understand and implement the procedures. This can be significantly more complicated when therapists are working with families of various cultural backgrounds.

ABA Outside the United States

It is not possible to become certified in ABA without demonstrating academic and applied mastery of the specialized terms and concepts. Therefore, it is likely that the lack of a non-English written translation of behavior analytic terms in the literature until 2014 has posed a barrier for training non-English speakers in ABA. Relatedly, there is a paucity of BCBA's in countries that are not primarily English speaking; there are nearly 2,000 active behavior analysts in Florida alone (Deochand & Fuqua, 2016), and zero active behavior analysts in Puerto Rico or Honduras (BACB Registry, 2019). Spain boasts the highest number of BCBA's outside of the United States with 16 active behavior analysts in the entire country, but most other Spanish-speaking countries average 1 to 3 analysts in total (BACB Registry, 2019).

Barriers to training behavior analysts in Spanish-speaking countries go beyond language. While there are reports of enthusiastic attempts to incorporate ABA into academic and professional communities, it seems that some countries have faced decades of barriers to accomplish this (Lopez, et al., 2006; Morales, 2006; Sanchez, 2006). For example, even though Peru has had a multitude of professionals hoping to pursue ABA since the 1970s, classes in behaviorism at the university level were not incorporated until 2003 (Morales, 2006). Further, even when professional ABA organizations thrive, such as the Revista Mexicana de Analisis de la Conducta (RMAC) in Mexico, there remains significant resistance to changing therapeutic and scientific modalities (Sanchez, 2006). Since opportunities in behavioral science are limited,

partially due to the dominant psychodynamic communities in Latin America, training behavior analysts has been challenging (Morales, 2006). In order to provide more quality ABA services, educational, systemic, and socioeconomic barriers should be considered as well.

Cultural Sensitivity in ABA Treatment

Due to the vast diversity represented in the United States, it is likely that behavior analysts will be required to provide services to clients from cultural backgrounds that differ from their own. Therefore, practitioners should assess the cultural and individual values of the patients and families they are serving. This will facilitate the achievement of one of the pillars of ABA, social validity, or a consensus on the acceptance and importance of a goal or intervention (Luiselli & Reed, 2011).

Cultural differences for consideration in treatment. Clinicians must remember that there are diverse perspectives on mental health, diagnosis, prognosis, and treatment among and within cultures. Between-group differences may manifest when designing goals for treatment; for example, the individualistic goals typical of Western cultures (e.g., independence) may not be as valued as other goals (e.g., family connection) in collectivist cultures (Humphrey, Bliuc, & Molenberghs, 2019). In order to provide treatment that is valuable to the client and his community, these differences should be assessed and considered when designing treatment goals. Further, it is more likely that family adherence to treatment will occur if it is considered socially valid (Lundquest & Hansen, 1998).

Within group differences are common factors to be considered as well. For example, some members of east Asian and Hindu groups in the United States have reported that they believe they have a child with autism as a form of punishment (Jegatheesen, Fowler, & Miller,

2010), while other members have reported viewing it as a blessing (Fiske, 2017). Both of these perspectives may impact the likelihood of diagnosis and treatment of autism, as they impact the moderating factors of family and community support. For example, viewing having a child with autism as a form of punishment could deter parents from seeking a diagnosis since family and community members may think the person with autism and his family deserve the challenges they face; viewing it as a blessing may deter seeking treatment because family and community members may not view the symptoms as needing change or remission. Further, Jegatheesen et al. (2010) reported that multiple Southeast-Asian Muslim families in the United States delayed seeking professional services for noticeable speech delays in their sons because of the cultural conception that boys speak later than girls.

Additionally, the cultural differences that occur when interacting with healthcare providers can impact treatment. For example, minority groups have reported perceiving White physicians as cold, direct, and distrustful (Jegatheesen et al., 2010). This has contributed to them seeking services from providers who have demonstrated less professional competence (e.g., obvious lack of knowledge of the disorder or necessary specialization), but greater cultural competence (e.g. asking detailed information/caring questions about patients' background; Jegatheesen et al., 2010).

Barriers to treatment. Families of individuals with ASD from minority backgrounds have expressed concern that their children will not be received or treated well by professionals (Burkett, Morris, Manning-Courtney, Anthony, & Shambley-Ebron, 2015) if they seek treatment. In order to provide quality services to diverse clients, behavior analysts should be cognizant of cultural differences when designing and implementing assessments and procedures (Fong, Catagnus, Brodhead, Quigley, & Field, 2016). Behavior analysts can demonstrate cultural

competence when working with people of diverse backgrounds by being aware of social constructs and expectations that make up their own culture and that of their clients (Fong et al., 2016). For example, some groups may view bare feet as offensive, while others do not allow shoes to be worn in the home. Additionally, knowledge of cultural perspectives that may be different from typical American culture can assist in presenting the intervention in a more socially acceptable way.

The barriers faced by minority groups that are multilingual are numerous. For example, bilingual children may experience a delay in autism diagnosis and are less likely to receive healthcare services than are primarily English-speaking children (Jegatheesan, 2009). Additionally, the largely monolingual culture of the United States contributes to healthcare providers' ubiquitous ignorance of the linguistic complexity that occurs in other cultures. This can negatively impact treatment because it neglects challenges that multilingual families may face when attempting to implement treatment recommendations. For example, many families are encouraged to speak only English in their home (Drysdale, van der Meer, & Kagohara, 2015), a recommendation that likely cannot be implemented due to either limited English proficiency and/or multilingual households that require different languages in order to fully communicate with each other.

Socioeconomic factors can also serve as significant barriers to treatment. People who are limited in their English proficiency in the United States are often also limited in their educational and vocational prospects. For example, nearly one-third of Latinos over 25 years old in the United States have not obtained a 9th grade education (Stone, Viruell-Fuentes, & Acevedo-Garcia, 2007). Educational differences between the provider and the consumer can create more barriers to receiving adequate care if the provider is not cognizant of jargon utilization. In

addition to limited English proficiency and low educational achievement, immigrants often face xenophobic hiring policies (Freedman, Owen, & Bohns, 2013), perpetuating financial challenges. Additionally, Latinos are less likely to have health insurance than non-Hispanic Whites (Stone et al., 2007). Therefore, ability to afford services even when available is a significant challenge.

While necessary, cultural competency may not be sufficient to adequately serve clients. For example, an understanding of the cultural practices of a Latino immigrant is not effective if the client speaks a different language than the behavior analyst. In these circumstances, an interpreter is necessary to facilitate the implementation of ABA services. To illustrate, a summary of how interpreters can impact mental health treatment generally will be provided before examining the role of interpreters in ABA.

The Impact of Interpreters in Treatment

As a part of the Civil Rights Act of 1964, Title VI states that healthcare providers who receive federal funding are legally obligated to provide interpretation services at no cost to non-English speakers (Chen et al., 2007). However, the law is not specific on what constitutes interpretation services; therefore, the people who are responsible for communicating crucial care information can vary from children of the patient to professionally certified interpreters.

The use of interpreters, either trained or ad hoc, can present ethical issues for health professionals, such as physicians and psychologists, as they are responsible for how the interpreters' translation and interaction with the client impact treatment. Interpreters may not be provided with training on handling personal health information, confidentiality, boundaries, or other ethical issues typically faced by health professionals as their occupations do not inherently

require knowledge in these areas. Further, interpreters may “editorialize,” or make changes to, what is being interpreted due to cultural or individual opinions on the appropriate way to convey what is being discussed (Anazawa, Ishkawa, & Kiuchi, 2012). For example, they may omit information or add their own opinion about how a patient is feeling.

Family members as interpreters. Wright (2014) highlights common ethical problems, such as multiple roles that the interpreters can play. For example, in the case in which the interpreter is a family member, the client may not be comfortable revealing private information to the mental health professional via family. Additionally, the client may be worried about the consequences if other family members were informed of his or her health concerns. A family member may deliberately or inadvertently censor the translation. In other words, family members may alter translations in accordance with what they believe is necessary for the healthcare provider to know, as opposed to translating everything the patient says. Multiple roles can also create unclear boundaries in a health setting, such as the interpreter giving his/her opinion on the treatment or advice on whether the client should disclose information to the professional (Wright, 2014). When these multiple roles occur, the ability of the psychologist to ensure accurate interpretation, as well as limit harm to those involved, is compromised.

Issues of interpretation can be particularly sensitive during child and family therapy, especially if the child is responsible for translating between the healthcare provider and the parent. Some of the information may be upsetting to the child, such as explaining terminal diagnoses their parents have received (Searight & Searight, 2009). Children and family members serving as translators can create undesirable dynamics during therapy and make it more likely that interpretation errors will occur (Flores, 2003). For example, if the child can communicate directly with the therapist but the parents cannot, it may create an uneven power dynamic and/or

make it more challenging to form appropriate alliances with all family members. Additionally, if a child's behavioral issues are the presenting concern, there may be some omissions or other forms of misinterpretation if the child does not want to communicate therapists' suggestions or his parents' description of the problem.

Spanish interpretation in healthcare settings. Generally speaking, the language barrier between Latino immigrants and health professionals has increased over recent decades, as there are currently more Spanish speakers in the United States than in Spain (Instituto Cervantes, 2017). Most health care settings do not have sufficient bilingual staff to meet the needs of the Spanish speaking population. In fact, from 1980 to 2010, there was an increase in Spanish-speakers, but a decrease in physicians that spoke Spanish (Sanchez, Nevarez, Schink, & Hayes-Bautista, 2015). Hence, interpreters are frequently hired to facilitate communication between professionals and patients. When trained interpreters are unavailable, bilingual staff or clients' family members sometimes fill this role. The use of an interpreter in health settings can be beneficial to treatment, but it also presents with a unique set of challenges. For example, misinterpretations can negatively and significantly affect therapy. Flores and colleagues (2003) investigated the types of errors typically made, the frequency of these errors and how they can impact treatment when translating from English to Spanish. Notably, they found that over 70% of false fluency errors that medical interpreters committed were related to professional jargon (e.g., gastric bypass, mumps, etc.). This signifies that current training in translating English to Spanish does not sufficiently address professional vocabulary in the medical field.

Accuracy of translations. An additional ethical issue is the challenge of ensuring the interpreter is competent in translating professional terms used by the health professional, as interpreters are not required to obtain training in the specific profession (Wright, 2014). In other

words, it is likely that a translator would be unfamiliar with important clinical terms that are not used in everyday language, even if they are certified as an interpreter or have received formal training in interpreting. Technical jargon is used frequently in healthcare settings when providing crucial information to patients. This issue is particularly pertinent to Latinos and other cultures who may feel uncomfortable expressing disagreement or misunderstanding to an authority figure (Beeber et al., 2009), as they may not ask for clarification of terms.

Further, the quality of translation is often unknown to the therapists because they do not understand what the interpreter says to the patient. Poor quality of translation can significantly impact treatment (Jackson, Rhodes, Inui, & Buchwald, 1997) because vital information, such as diagnosis, is omitted more frequently in interactions requiring an interpreter than in those that do not (Baker et al., 1998). The lack of accurate interpretation can significantly decrease the quality of services. Flores et al. (2003) found that more than 60% of the errors made by interpreters had potential to impact treatment. These errors included interpreters failing to convey pertinent information about presenting issues and symptoms, personal information about the client, not communicating stated behavioral issues, substituting descriptions of behavioral concerns, as well as others involving frequency and type of treatment to the professional. The results of Flores and colleagues' study indicate that interpreters are making frequent and significant errors that negatively impact the quality of health care received by clients with limited English-speaking ability.

Even if errors in translation do not impact the quality of treatment, they may still have a significant impact on the quality of the relationship between the provider and the patient, or the rapport. Clients who have received health care services facilitated by interpreters have expressed overall dissatisfaction, indicating that the use of interpreters can negatively impact the

interpersonal relationship between the patient and the professional/service provider. For example, Baker et al. (1998) found a significant difference in satisfaction with interpersonal aspects of treatment expressed by clients who required an interpreter and those who did not and suggest that patients who are unsatisfied with the interpersonal relationship with healthcare providers are less likely to adhere to treatment.

Having an interpreter can be beneficial to treatment and, in some cases, the only way for a client to receive services. However, poor quality of interpretation can lead to negative consequences for the client. In addition, the costs of inadequate interpretation can extend beyond the patient; the expense of inaccurate diagnosis and consequential treatment may be higher than the cost of hiring competent interpreters (Bischoff et al., 2003). Further, errors due to misinterpretation represent a form of negligence that can result in settings being sued (Searight & Searight, 2009). The ability to accurately convey health information to patients is essential if a healthcare setting wants to provide quality services and avoid the costly consequences. Unfortunately, there are not enough bilingual mental health professionals available to meet the growing and urgent need of the Spanish-speaking population. Given the necessary reliance on interpreters, identifying procedures for improving the translations of interpreters will be critical in improving the care provided to patients in health settings.

Guidelines for Improving Interpretation

Tribe and Lane (2009) recommend that training be provided to interpreters working in mental health settings before they begin working with clients, and researchers have compiled guidelines and suggestions to address the inadequacy of interpreter training in healthcare settings. To begin, Rousseau, Measham, and Moro (2010) suggest that when working in pediatric settings, interpreters should be educated on Western views of childhood development and how

these compare to other cultural perspectives, the cultural appropriateness of certain nonverbal and verbal communication (e.g., eye contact), and differences in cultural values of education and family roles. These suggestions are imperative for the accuracy of pediatric care communication between professionals and family members that do not speak the same language and represent diverse cultural backgrounds in order to ensure that what is being translated is being interpreted correctly.

Few studies investigate the effectiveness of additional training to improve interpretation of medical and psychotherapy sessions. Acosta and Christo (1982) tested a parent-training program designed to improve interpretation and psychological services in providing psychotherapy to Mexican-American clients in California. An important aspect of this program was that all interpreters were both linguistically and culturally matched to the participants, meaning that the interpreters included in this program not only spoke the same language as the clients, but also grew up in the same communities. The specifics of the program are largely omitted from the written description of the study, but the researchers stated that course content in vocabulary unique to mental health settings (e.g., terms frequently used in psychological interviews and assessments) were provided weekly. Additionally, the interpreters received detailed feedback regarding interpretation of jargon, nonverbal communication, accuracy of translation, and other aspects of the interpretation that occurred during session. This feedback was based off video and audio tapes of therapy sessions. Interpreters and nurses reported that they found the intervention beneficial in a multitude of ways. Qualitatively, they endorsed that the additional interpreter training facilitated accurate translation and improved their ability to work within a triad when each was accustomed to working in dyads. The study did not include information regarding the potential quantitative impact on the quality or accuracy of translations.

This program had significant impacts on the community; prior to the program only 1% of new admissions to the clinic only spoke Spanish and following the program that amount increased to 15% of new admissions.

Although the Acosta and Christo study (1982) demonstrated their program's success in increasing dissemination of services to a population with limited English proficiency, it did have some limitations. First, since no control group was used in the research, one cannot determine how much of the increase in new admissions was due to the program implementation or to an extraneous variable (e.g., population increase). Second, while the use of community aides is ideal for interpretation, it is not always possible to employ interpreters from the same communities as patients, or even the same countries. Third, it may be challenging to have interpreters participate in an intensive, weekly training due to financial and time constraints. Fourth, it is unclear whether the intervention actually improved interpretation accuracy, as only qualitative measures of improvement were used.

Beeber and colleagues (2009) addressed some of the previous limitations during their investigation of the consequences of using an interpretation model when administering an in-home intervention for Latina mothers at risk for depression. The intervention was designed to help newly immigrated Latina mothers engage in behaviors that would prevent depression, since they were at an elevated risk for developing these symptoms. The researchers developed a 6-hour interpreter training course that taught specific mental health vocabulary and skills that could be particularly useful when translating psychological services (e.g., appropriate use of emotional vocabulary, behaviors that would minimally influence the relationship between the healthcare provider and the client, management of difficult emotions, etc.). After the course was completed, the interpreters participated in additional training with the healthcare providers involving role

plays and instruction on how the interpreters and healthcare providers could work as a team during the implementation of the intervention.

Beeber and colleagues (2009) noted qualitative reports of successful interactions among the therapist, translator and mother, as well as an enhanced ability to administer the intervention. However, there were again limitations to this study. First, this study also did not include a control group so it is unclear how the interpretation model impacted treatment as compared to no use of training. Second, again, there were no data provided on accuracy prior to and following the training. Finally, the researchers did not indicate any improvements in mother's depression symptoms. Further research needs to be conducted to address, quantitatively, how the intervention directly impacts the delivery and outcomes of treatment.

Bergunde and Pollebauer (2019) designed a training program specifically for interpreters working in asylum settings. The researchers highlighted that current problems with community interpreting are related to cost, lack of basic linguistic labor force (e.g., language is non-traditional/not typically taught in schools), and time needed to further professional development. Additionally, they point out the array of educational backgrounds and formal training of interpreters in asylum settings, ranging from no training in interpretation to the court-certified level. This is similar to concerns in the healthcare field since interpreters range from medically-certified interpreters to those without formal training. In order to address these issues, the researchers developed twelve training modules that include role plays, terminology presented in plain language, readings, worksheets, and critical thinking. While this training model seems likely to address the interpretation concerns occurring in asylum settings, it remains expensive and time-consuming, as it costs about \$2,000 per person and requires weeks of participation.

Further, the model has not yet been implemented; therefore, it is not clear whether participation will improve interpretation.

Currently, there is a dearth of research that provides direct evidence that a formal training program increases translation accuracy of professional jargon. Further, the interventions above were time consuming and entailed additional expenses, as they required about a week of intensive, additional training during which they were not earning money translating. Therefore, there remains a gap in the literature on effective interpretation of psychological jargon, especially regarding quantitative improvement in accuracy. I will investigate this critical area, specifically as applied to ABA intervention.

Interpretation of ABA

As previously described, low quality interpretation of services in health professions can significantly impact treatment in a multitude of negative ways; it leads to misdiagnoses, inappropriate referrals, poor therapeutic rapport, and low adherence to treatment, among other negative consequences (Baker et al., 1998; Bischoff et al., 2003; Flores et al., 2003). The effects in ABA therapy would not be expected to be any more favorable with poor interpretation, and it may be likely that clients with limited English proficiency are receiving a significantly lower quality of care in ABA than English speakers. Current interventions designed for improving interpretation services among other health professions are time consuming and expensive (Acosta & Christo, 1982; Beeber et al., 2009; Bergunde & Pollebauer; 2019), and their effectiveness in improving translation of professional jargon has not been investigated. With regard to ABA, no current interpreter training program exists in the academic literature. This means that there is an urgent need for services in an underserved community that is not presently

being addressed, especially given that the terminology used in ABA can be viewed as aversive and confusing to lay people.

ABA jargon. Similar to many professions, such as law, accounting, psychology, and others, ABA has terminology associated with its concepts, procedures, and interventions that is not typically utilized in everyday conversations. However, in professions unrelated to health and human services, it may not be important that laypeople understand the jargon associated with the profession. For example, an information technology expert can fix a computer without explaining to the owner what a central processing unit (CPU) is or the techniques the professional implements.

Unfortunately, the jargon associated with ABA may interfere in efforts to teach laypeople the concepts and techniques needed to ensure best practice. In some cases, the terms used in ABA may have different meanings than the standard definitions. For example, the word “negative” in everyday language refers to something undesirable (e.g., a negative person). However, in ABA jargon, it simply refers to the removal of a stimulus. For example, the term “negative reinforcement” refers to the removal of something the student finds aversive following a student’s desirable behavior that increases the likelihood of the behavior occurring again in the future (Skinner, 2005). Further, ABA jargon includes terms that are not a part of the English language (e.g., mand, intraverbal), which exacerbates others’ difficulty in understanding it.

Not only can ABA jargon be challenging to understand, but it has been described as brusque and aversive (Critchfield et al., 2017). One reason for this perception of ABA is that behavior analysts repurpose words that have negative connotations in everyday language. For example, Foxx (1990) pointed out that while “chaining” and “discrimination” are benign terms among those who use ABA terminology, laypeople often associate these terms with harmful acts.

Additionally, people find common ABA terms more abrasive than terms utilized in other professions (Critchfield et al., 2017). Further, Critchfield and Doepke (2018) found that the negative emotional reactions ABA evokes in English-speakers extends to five other languages. For example, ratings of an unpleasant reaction to an ABA term in English was predictive of an unpleasant reaction to the same term in Spanish. In other words, people unfamiliar with ABA procedures, such as caregivers, teachers, and other consumers, are likely to perceive ABA as aversive simply because of the language utilized by its experts. The way consumers perceive ABA can have significant consequences for those in need of services. Critchfield and colleagues (2017) posited that this aversion may lead consumers to reject professionals in ABA and/or avoid seeking their assistance. This can be particularly problematic for members of minority groups, who already encounter difficulties in receiving health services (Holden et al., 2014).

While many ethnic groups struggle to access the healthcare they need, those from a non-English speaking background face the additional challenge of a language barrier. When parents speak a language other than English, the issue of jargon becomes more complicated as a third party (typically an interpreter) is now responsible for conveying the meaning of terminology with which the translator is likely to be unfamiliar. In other words, competency is required beyond fluency in both languages, but in professional and cultural aspects as well.

Because of the technical jargon inherent in ABA, an initial area of focus could be on how to better train the interpretation of behavior analytic terms when explaining procedures to clients and their families. Cultural sensitivity, rapport building, and education about treatment are as essential in ABA as they are in the previously mentioned medical and psychological fields (Fiske, 2017). However, there are currently no published studies on this topic. Poor translations can occur in professional contexts where jargon may be miscommunicated. This likely occurs

because the interpreters are unfamiliar with the terminology in either language. For example, while most English-speakers have encountered the term *extinction*, their understanding of it is typically limited to the loss of an animal species; they are unfamiliar with the ABA definition which describes a procedure that withdraws access to reinforcement following the occurrence of behavior.

As a way to guide appropriate translation of ABA jargon, Virues-Ortega and colleagues (2014) developed a glossary of ABA terms in Spanish using the following methodology. First, the authors simplified translation whenever possible. Second, they strived to keep the translated ABA terms as similar as possible to the original English terms. In other words, if two terms were available for translation, the authors chose the word that sounded most similar to the original English word (e.g. *conducta* instead of *comportamiento* for *conduct*). They also used similar paraphrases when necessary so that the translation was as similar as possible to the original phrasing. Finally, the authors needed to reach a consensus on each translation, which required that multiple researchers agree on each term's clarity and objectivity. The resulting glossary comprises over 1,200 ABA terms translated from English to Spanish. While this glossary represents a major milestone for expanding ABA services to non-English speakers, the utilization of this glossary in applied contexts (e.g., when providing training in ABA) has not been investigated.

People from minority backgrounds face a multitude of barriers to receiving the healthcare services they need. Specifically, people whose primary language is Spanish may not receive quality care because the translation of crucial clinical terms is misinterpreted. The purpose of this current study is to investigate the effectiveness of a brief intervention designed to improve the translation of ABA jargon from English to Spanish. Accurate translation is particularly important

in ABA because lay people (e.g., parents, teachers, etc.) are often essential in best practice implementation of the treatment. By utilizing a Spanish glossary of ABA terminology to train interpreters in correct translation of behavior analytic terms, it is expected that interpreters will become more familiar with effective translations of the jargon. Following the intervention, the accuracy of terminology translation should significantly improve. This will facilitate quality healthcare services to an underserved population.

Methods

Participants

Three participants were recruited for the current study. The first recruitment stage involved contacting the Hispanic Studies Department at Rutgers and interpreter business listservs with a recruitment flyer. During the second stage, the recruitment flyer was sent to graduate student listservs at Rutgers University with bilingual members. Eligibility for participation in this study included being bilingual in English and Spanish; board certified behavior analysts and individuals/interpreters who had significant experience with ABA jargon were excluded. Once participants responded to the initial flyer, they signed a consent form for participation and audio recording (Appendix A). Participants were compensated \$50 for 2 to 3 hours of their time, with the first \$25 being paid after their first session and the second \$25 paid after their final session.

There were seven initial respondents to the initial flyer, but four were not eligible to participate due to inability to meet in person. Three participants were included in this study. The first participant was a Hispanic male in his 40s. He has a master's degree in Language Interpretation, Translation and Localization. He has been a freelance interpreter with a specialization in conference, legal and medical fields for more than 15 years, and has more than

five years of experience as a medical interpreter in a hospital setting. He does not have any background in behaviorism or psychology.

The second participant was a Dominican-American male in his mid-20s who is bilingual in English and Spanish. Although he does not have formal training in interpretation, he has a master's degree in psychology and is pursuing his doctorate in psychology. He regularly uses Spanish with clients in community and hospital settings as well as with family members. He did not have any experience in ABA.

The third participant was an Asian female in her mid-20s who is bilingual in English and Spanish. While she does not have any formal interpreting experience or training, she is providing psychotherapy in Spanish while pursuing her doctorate in psychology. She did not have any background in ABA.

Materials

Ten distinct scenarios representative of a typical conversation between a behavior analyst and parent were presented, in role-play form, to the interpreter for translation. The script for each scenario included the same ten behavior analytic terms to be analyzed for accuracy, though the surrounding language varied (see Appendix B). The order of the presented scenarios was randomized for each of the three participants. Each session was recorded separately via a voice recorder application on a password protected telephone.

The ten behavior analytic terms were selected terms from the English-Spanish Glossary of Behavioral Terms Glosario Inglés-Español de Términos Conductuales (Virues-Ortega et al., 2014). This text was referenced to determine accuracy of translation. The vocabulary included in the glossary was considered the correct translation of behavior analytic terminology; exceptions

were not made. The ten behavior analytic terms and their corresponding Spanish translation were: behavior analyst/*analista del comportamiento*; reinforcer/*refuerzo*; applied behavior analysis/*análisis de la conducta aplicada, análisis aplicado de la conducta*; backward chain/*encadenamiento hacia atrás; encadenamiento retrógrado*; contingency/*contingencia*; correction procedure/*procedimiento de corrección*; data collection/*toma de datos*; discrete trial training/*enseñanza de ensayos discretos*; escape maintained behavior/*conducta mantenida por escape*; generalization probe/*sondeo de generalización*. These ten terms and their corresponding translations were provided to participants as an abbreviated glossary to study so that they could better prepare for the specific vocabulary they would be expected to use (see Appendix C).

Dependent Variable and Interobserver Agreement

The dependent variable in the current study was the accuracy of participants' translations of behavior analytic terms. Each session, as described below, was transcribed from the recording and the translation of each term was scored as correct or incorrect using the glossary compiled by Virues-Ortega and colleagues (2014). Only behavior analytic terms were scored as correct or incorrect; errors in other parts of the translation were not scored. The percent of ABA terms correctly translated was determined by dividing the number of correctly translated terms by the total number of terms and multiplying by 100.

The accuracy of translation was scored by the principal investigator and a research assistant who are both fluent in Spanish. Trial-by-trial interobserver agreement (IOA) on the accuracy of translations was collected by the two independent observers (the principal investigator and research assistant). Point-by-point analysis was used to determine the accuracy of each translated word in a session. In other words, each ABA term was scored as correct as incorrect by the two observers, then the number of agreements between the two was divided by

the total number of agreements and disagreements and multiplied by 100. In order to establish the agreement between observers, a recording of a confederate interpreting the ten scenarios was used during training until the observers reached 80% agreement across three sessions. IOA was calculated on 33.3% of each participant's sessions. The mean IOA for Participant 1 was 96.7% (range, 90.0%-100.0%), for Participant 2 was 96.7% (range, 90.0%-100.0%) and for Participant 3 was 96.7% (range, 90.0%-100.0%).

Design

A nonconcurrent multiple baseline design (Barlow & Hersen, 1984) was utilized in order to observe increases in translation accuracy across the three participants in response to training. Baseline data was collected, as described below, on the accuracy of each participant's interpretation. Once baseline data were stable for the first participant, Training 1 was implemented with that participant. The same procedure was followed with the second and third participants in a staggered fashion, where each baseline was longer than that of the previous participant. These data were analyzed through visual inspection and comparison of baseline to post-intervention data within each subject's performance.

Procedure

Sessions took place in a private room at Rutgers University in the Psychology building. Once consent to participate in the study was received from a participant, baseline measures were implemented. During all phases of the evaluation, the principle investigator met with each participant individually. During each session, the principle investigator read aloud one scenario, and asked the participant to translate the scenario aloud in Spanish. Participants translated the scenario as the principle investigator read it, and the principle investigator paused to allow time

for the participant to translate. The principle investigator recorded the participant's interpretations. Terms or phrases were repeated as requested by the participants. Additionally, all sessions were audio recorded.

Baseline. During baseline sessions, after the participant had completed his/her translation of the scenario presented by the principle investigator, no feedback was provided for either correct or incorrect translations. When participants asked for help or validation on their interpretations, they were instructed to try their best. Each session, which was the length of one translation, lasted between 2 and 3 minutes. The initial one or two meetings (comprising all baseline sessions) took 10 to 15 minutes total for each participant.

Training 1. Immediately following the completion of baseline, each interpreter was provided with a subset of the previously mentioned glossary (see Appendix C) and instructed to study it for a period of one week. A second meeting was scheduled with the interpreter for one week after their initial meeting for probe sessions.

Probe. A probe of translation accuracy occurred following Training 1. The process was identical to baseline, with no feedback provided for correct or incorrect translations. Criterion for mastery in this phase was 90% correct translation over three consecutive sessions. A typical meeting for probe sessions lasted 10 to 30 minutes with 3 to 7 role plays possible during this phase.

Training 2. If mastery criterion was not met following Treatment 1, the principle investigator intended to conduct further intervention. This training was not needed for any of the three participants. However, the planned intervention was based on behavioral skills training, a method commonly used in ABA to improve implementation skills among professionals (Miles &

Wilder, 2009; Sarokoff & Sturmey, 2004; Wallace, Doney, Mintz-Resudek, & Tarbox, 2004). First, the experimenter would have modeled correct translation of one of the scenarios by translating the vignette. In other words, the experimenter would have modeled what the participant was expected to do. Next, the participant would have translated a role play of the same scenario with a confederate while receiving feedback from the experimenter for correct and incorrect translations. Finally, the participant would translate another role play without prior modeling by the experimenter, and specific, immediate feedback would have been provided following translation of each ABA term. Rehearsal with performance feedback would have continued until the interpreter was able to independently translate the ABA terms in the scenario with 90% accuracy across two consecutive sessions.

Results

As illustrated in Figure 1, data indicate a significant improvement in interpretation following the first training for all participants. Participant 1 demonstrated a stable trend and low level of correct translation at baseline, with only 1 of 10 (*contingency/contingencia*) terms interpreted correctly across three consecutive vignettes. Following Training 1, Participant 1's performance increased immediately to near acquisition level (70%), and he quickly met mastery criteria by interpreting 9 of 10 (90%) terms correctly across three consecutive vignettes.

Participant 2 also demonstrated low levels of correct translation at baseline. Across five vignettes, he consistently interpreted only 1 out of 10 words (10%) in accordance with the glossary (*contingency/contingencia*). Following the intervention, Participant 2 demonstrated an immediate and significant increase in accurate interpretation, quickly reaching 80% accuracy followed by correct interpretation of 90% of terms correct across three consecutive vignettes.

Participant 3 demonstrated a stable trend at a low level during the baseline session. Across seven vignettes, her performance ranged from 10% to 20%. Following the intervention (Training 1), Participant 3 demonstrated an immediate, significant increase in accurate interpretation. She correctly interpreted each of the ten words (100%) across three consecutive vignettes.

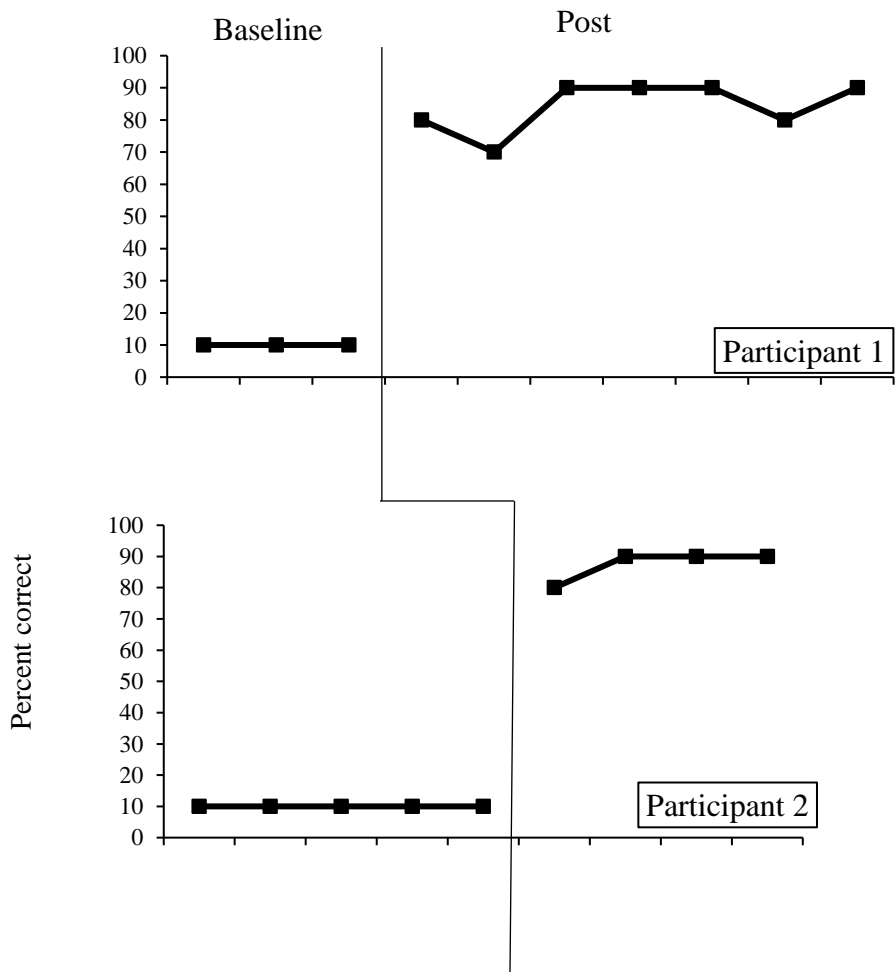


Figure 1. Results representing the percentage of correctly interpreted terms across sessions for each participant.

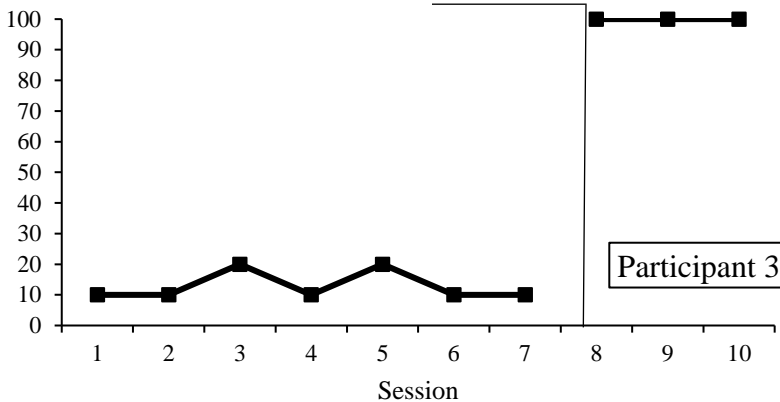


Figure 1. continued

Discussion

Current research has demonstrated that quality interpretation services are scarce, particularly in professional settings where jargon is frequently utilized. The limited attempts to address this paucity have shown some effectiveness, but they are generally through intensive and costly trainings. This study aimed to test the effectiveness of a brief intervention on the interpretation accuracy of behavior analytic terminology from English to Spanish.

An important result of this study is that no participant utilized the correct ABA terminology at baseline, signifying that behavior analytic terminology needs to be explicitly taught to ensure accurate interpretation. This is consistent with findings by Flores and colleagues (2003) which demonstrated that the majority of errors committed by interpreters were related to specialized vocabulary. Additionally, it provides evidence supporting the concern that interpreters are not receiving sufficient training to interpret specifically to professional settings (Wright, 2014).

Similarly to Flores and colleagues' (2003) findings, some errors had the potential to significantly impact treatment. For example, one participant incorrectly interpreted "backwards chain" as "chain from his past." This interpretation could cause unnecessary confusion and concern, especially since caregivers may be instructed to use a backward chain with their child. Other accuracy errors were due to agreement, such as using the masculine version (typically ending with an *o*) of the word instead of the feminine version (typically ending with an *a*), which led to the use of words that do not exist in Spanish (i.e. *analisto* instead of *analista* for analyst) or a change in the meaning of the word (i.e. *conducta* means behavior, while *conducto* means conduit). Both translations could lead to confusion for caregivers.

All three participants met mastery criteria following the intervention. This is significant because there is limited research supporting interventions that can improve interpretation accuracy. Further, those that do exist are intensive and time-consuming (Acosta & Christo, 1982; Beeber et al., 2009; Bergunde & Pollabauer, 2019; Rousseau, Measham, & Moro 2010; Tribe & Lane, 2009). For example, in contrast to the present study which had no monetary cost to the interpreter and took about one week, the training developed by Bergunde and Pollabauer (2019) costs around \$2,000 per person and takes months to complete. While their proposed training was specialized for asylum interpretation, it also addressed broader interpretation skills (e.g., professionalism, omission/additions, etc.), which may partially account for the additional time and cost. Further, the proposed model was not implemented in their investigation.

The studies that have implemented interpreter trainings did not investigate accuracy in response to intervention, or utilize control groups (Acosta & Christo, 1982; Beeber et al., 2009). As a result, there is little research into how intensive interventions impact interpretation accuracy. The current investigation provides evidence that a brief, no-cost intervention can

significantly improve interpreter accuracy from English to Spanish. This evidence is strengthened by the control demonstrated by the single subject design used.

The amount of experience participants had in formal interpretation did not seem to significantly impact quality of interpretation. Regardless of background, participants demonstrated similar baseline and post-intervention interpretation accuracy. This stands in contrast to findings by Anazawa, Ishkawa, and Kiuchi (2012), whose results demonstrated that participants with more interpreting experience made fewer errors than participants with medical backgrounds. However, general fluency and accuracy of non-ABA terminology was not assessed in the current investigation, so it is possible that differences in these areas may have occurred. For example, previous research has found that interpretation mistakes in community settings not only include errors in specialized vocabulary, but also in omissions, additions, and fluency (Anazawa, Ishkawa, & Kiuchi, 2012; Flores et al., 2003; Rousseau, Measham, & Moro 2010) which can similarly confuse the message that the recipient receives and degrade the relationship between professional and patient.

The results of the current study offer a crucial first step in the translation of ABA terms into Spanish as it offers an effective method for preparing interpreters to convey professional vocabulary. Research has demonstrated that jargon can be particularly challenging to interpret, and few studies have tested methods to improve accuracy (Anazawa, Ishkawa, & Kiuchi, 2012; Flores et al., 2003). Further, there are financial and time barriers for the trainings that do exist in the literature (Acosta & Christo, 1982; Beeber et al., 2009; Bergunde & Pollabauer, 2019). The current study offers a quick and free way to improve interpretation accuracy while providing ABA to clients with limited English proficiency. However, accuracy is only one part of quality interpretation. For example, the interpreter may correctly translate “reinforcer” to “reforzador”,

but the consumer may still not understand what the term means; therefore, further investigation should be conducted into how consumers comprehend interpretations of ABA vocabulary.

Consumer Reception

While the current study emphasized accuracy as a crucial point of communicating effectively, it did not address the issues of how consumers comprehend and react to the determined terminology. DiMatteo and Hays (1980) found that an overuse of jargon or an underestimation of consumer knowledge can significantly impact patient health. This is particularly relevant when working with some patients from cultures that are unlikely to question or request clarification from a professional (Jegatheesen, Fowler, & Miller, 2010). Further, communication between healthcare providers and patients significantly impacts whether a patient will adhere to a treatment regimen (Stevenson, Cox, Britten, & Dundar, 2004). As previously discussed, consumers' adherence to treatment is an essential component of behavior analysis as treatment often depends on caregivers and other community members implementing treatment plans with clients. If professionals utilize vocabulary that is difficult to comprehend or causes an aversive reaction, it is unlikely that the treatment plans will be implemented effectively. Awareness of communicative interactions and their impact on clients is vital to providing quality healthcare services as it can affect treatment outcomes.

Previous research has demonstrated that ABA jargon is perceived as unpleasant across a multitude of languages (Critchfield & Doepke, 2018) and consumer groups (Skiba and Deno, 1991). Negative perceptions of the language used to discuss treatment can lead to avoidance of treatment discussions and implementations. This issue has impacted ABA for decades (Critchfield, 2017). The communication challenges between professionals and nonexperts likely

increase when there are linguistic and cultural differences between provider and consumer as well.

In fact, the jargon utilized in ABA has led to a number of ethical issues in the field. First, the Behavior Analyst Certification Board (BACB) ethical guidelines explicitly state “when behavior analysts provide behavior analytic services, they use language that is fully understandable to the recipient of those services” (BACB Professional and Ethical Compliance Code, 2019). However, there is considerable research demonstrating that the vocabulary behavior analysts utilize is often misunderstood by consumers (Becirevic, Critchfield, & Reed, 2016; Critchfield et al., 2017; Hipline, 1990; Morris et al., 2001). Further, research by Becirevic, Critchfield and Reed (2016) demonstrated that lay people generally find non-technical substitutes more socially acceptable than behavioral analytic jargon. The specialized vocabulary utilized by behavior analysts has created a barrier so significant to treatment that Cihon, Cihon, and Bedient (2016) have created a glossary of terms translated to “plain English.” It’s possible that a translation from the plain English version to Spanish may be a simpler process and more successful in communicating with consumers; in this case, successful translation would rely on practitioners describing behavioral concepts in easily understood and translatable terms that are more easily understood by the general public. When lay glossaries are not available, behavioral skills training may be beneficial in increasing practitioner skill at explaining ABA terminology as it could focus on ensuring consumer comprehension instead of interpreter memory retention of specific responses which may not be meaningful to the consumer.

As was proposed in the current study, but also extending to this area of consumer reception, behavioral skills training could be added to interpreter training in order to better address cultural and individual barriers to comprehension. This could involve assessing for

miscommunications or misunderstandings during translations, modeling specific corrections (e.g., modeling “reforzador” in the interpretation if the interpreter mistakenly said “refuerzo”), and role plays and providing immediate feedback during the interpretation. Behavioral skills training could also be used to decrease the overall use of jargon and increase use of “plain” language.

Cultural considerations. The presence of an interpreter has been shown to significantly impact rapport, diagnosis, treatment decisions and healthcare outcomes (Baker et al., 1998; Bischoff et al., 2003; Flores et al., 2003; Searight & Searight, 2009; Wright, 2014). Similarly to consumer reception in English, however, effective communication requires more than speaking the same language. Researchers have argued that quality interpretation not only requires bilingualism, but biculturalism as well (Cheatham, 2011). As previously mentioned, the glossary utilized in this study went through a rigorous process that required an international committee approve its acceptability in various countries and continents (Virues-Ortega, Martin, Schnerch, Garcia & Mellinchamp, 2015). However, language is only one factor in comprehension. Other cultural considerations, such as education level, have not been investigated in terms of the determined interpretations’ acceptability and accuracy. For example, though professionals may be able to understand the intended message of “conducta mantenida por escape” (escape-maintained behavior), that same translation could be confusing to someone with a different background. Conveying information in a way that the client can understand is essential to culturally competent treatment (Fong et al., 2016) One way to address this is by assessing what else needs to be included in interpreter training in order for services to be effective. For example, other trainings have focused on cultural similarities between the interpreter and the consumer, even as specific as being from the same neighborhood (Beeber et al., 2009). Additionally,

Bergunde and Pollebauer (2019) emphasized plain language and critical thinking in order to improve interpretation services. It remains unclear how impactful cultural considerations and consumer comprehension can be on interpretation quality.

Limitations and Future Directions

The present study provides evidence that a brief intervention can be effective in improving the interpretation of behavior analytic jargon from English to Spanish. However, these findings should be interpreted with caution due to some limitations.

Participants were asked to interpret in a controlled, structured setting. This differs from the fast-paced, high-stress environments where interpreting typically occurs, such as healthcare settings. There is likely little time for either the medical provider or interpreter to prepare or predict vocabulary necessary to appropriately communicate healthcare information. Additionally, doctors, psychologists, behavior analysts and other professionals typically have limited time they can spend with patients, and the added pressure of conveying diagnostic and treatment information under a time limit may impact interpreter performance. It may be easier to recall newly acquired terms in controlled settings than in the unpredictable situations that frequently occur in homes, schools, clinics, or hospitals. Future studies could investigate the generalization of interpretation accuracy across locations. Additionally, participant criteria in this study excluded those who had a background in ABA and only one participant was a trained interpreter. A future study could examine the errors of interpreters who have been asked to translate for an ABA program in order to better understand interpretation in real-world settings.

The study tested a small sample of potential terminology utilized in ABA (10/1228 words from the Virues-Ortega et al., 2014 glossary). It is possible that some words could be easier to

interpret than others. For example, all participants correctly interpreted “contingencies” during baseline. This may be due to the Spanish and English terms being cognates. Additionally, it is possible that some terms are harder to acquire than others. It is possible that some terms do not require intervention, while others may need more intensive intervention in order to acquire them. This could be addressed by replicating the study design while expanding and varying the terms used.

The current investigation had a small sample size that was limited to adults with high educational achievement (all had received a bachelor’s degree, and two were doctoral level students). It is possible that the intervention would not be as effective with people from less educated backgrounds or without formal training in interpretation (e.g., family members). Research has demonstrated that professional interpreters are less likely to make clinical interpretation errors than ad hoc interpreters (Flores, Abreu, Barone, Bachur, R, & Lin, 2012).). For example, family members filter information and make mistakes more frequently than professionals (Rosenberg, Leanza, & Seller, 2007) Further, a study conducted by Bischoff and Hudelson (2010) indicated that physicians perceive professional interpreters to provide significantly better interpretation services than ad hoc interpreters. Since research has shown that many consumers rely on family or community members to interpret for them, it would be valuable to expand the sample to be more representative of these groups.

Finally, as has been discussed, the consumer reception of the interpreted scenarios was not investigated. The terminology used was the result of a linguistic collaboration of researchers to translate an ABA textbook; it was a translation by professionals, for professionals, not necessarily targeted for community consumer use. The lack of communal input suggests the possibility that even if the terms are interpreted correctly, people unfamiliar with ABA may not

understand what is being conveyed. For example, one interpreter stated that they had particular difficulty with the translation for “backwards chain” because it “does not make sense in Spanish.” While this is surprising since the researchers who determined that translation are native Spanish speakers, one explanation may be that while professionals understand ABA’s specialized vocabulary, it is likely confusing to nonexperts (Cihon, Cihon, & Bedient 2016). Further, consumers often express an aversion to ABA terminology across languages (Critchfield & Doepke 2018). Future studies could investigate how the interpretation provided is perceived by non-English speaking consumers by investigating consumer comprehension and acceptability of terminology used. One way to accomplish this would be to present the glossary to native speakers and ask them to explain/define the terms, then assess for agreement between native speakers and the glossary as well as agreement among native speakers. Additionally, one could replicate the study conducted by Critchfield and Dopeke (2018) but assessing emotional responses of Spanish-speakers specifically to the terms in the glossary created by Virues-Ortega and colleagues (2014).

Implications

Despite the limitations, the results of this study demonstrate that a brief intervention can improve the accuracy of behavior analytic interpretation from English to Spanish. The current investigation illustrated that providing a list of 10 vocabulary words within a week of interpretation can significantly improve accuracy. While this is only a first step, as the study investigated only the translation of terms and not listener comprehension, it is necessary to further our understanding of how we are sharing behavior analysis with different cultures.

The findings of the current investigation have many crucial implications. First, they address the frequently cited issue of adequate interpretation services (Anazawa, Ishkawa, &

Kiuchi, 2012; Flores et al., 2003; Flores et al., 2012 ; Searight & Searight 2009) by significantly improving accuracy of professional terminology interpretation. Second, the intervention demonstrates quick acquisition at a low/no cost, providing an alternative to current interventions that are time consuming and expensive (Acosta & Christo, 1982; Beeber et al., 2009; Rousseau, Measham, & Moro 2010; Tribe & Lane, 2009). Third, research has found significant discrepancies in the quality of interpretation via professional versus ad hoc interpreters (Bischoff & Hudelson, 2010; Flores et al., 2012; Rosenberg, Leanza, and Seller, 2007); formal training (or lack thereof) in interpretation did not impact participants' ability to meet mastery criteria, which suggests the possibility that the intervention could be effective with both professional and ad hoc interpreters. Naturally, improved accuracy will likely lead to improved quality of care for Spanish speakers who need applied behavior analytic services.

While there were several limitations to this study, the results provide evidence that a brief, no-cost intervention can significantly improve accuracy of ABA terms from English to Spanish. Therefore, it is recommended that future studies investigate how the utilization of the intervention could impact outcomes in healthcare settings as well as ways to further improve interpretation training, such as behavioral skills training to improve communication between healthcare provider and consumer that goes beyond simple vocabulary.

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Table 1

English and Spanish Versions of the Ten ABA Terms Assessed for Accuracy

English Term	Spanish Term
Reinforcer	Reforzador
Applied behavior analysis	Análisis aplicado de la conducta o análisis de la conducta aplicada
Backward chaining	Encadenamiento hacia atrás o encadenamiento retrógrado
Behavior analyst	Analista de conducta
Contingency	Contingencia
Correction procedure	Procedimiento de corrección
Data collection	Toma de datos
Discrete trial training	Enseñanza de ensayos discretos
Escape-maintained behavior	Conducta mantenida por escape
Generalization probe	Sondeo de generalización

Appendix A

I. SUBJECT CONSENT TO TAKE PART IN A RESEARCH STUDY**TITLE OF STUDY: Improving Translation of ABA Jargon from English to Spanish****Principal Investigator: Jaye Odom PsyM, BCBA**

This consent form is part of an informed consent process for a research study and it will provide information that will help you to decide whether you wish to volunteer for this research study. It will help you to understand what the study is about and what will happen in the course of the Study.

If you have questions at any time during the research study, you should feel free to ask them and should expect to be given answers that you completely understand.

After all of your questions have been answered, if you still wish to take part in the study, you will be asked to sign this informed consent form.

You are not giving up any of your legal rights by volunteering for this research study or by signing this consent form.

Who is conducting this research study?

Ms. Jaye Odom is the Principal Investigator of this research study. A Principal Investigator has the overall responsibility for the conduct of the study. However, there are often other individuals who are part of the research team.

Ms. Jaye Odom may be reached at [505-239-5225] (151 Ryders Lane, New Brunswick, NJ 08901.)

The study lead, Ms. Jaye Odom, or another member of the study team will also be asked to sign this informed consent. You will be given a copy of the signed consent form to keep.

Who might benefit financially from this research?

No research team members will directly benefit financially from this research.

Why is this study being done?

The purpose of this research is to evaluate the translation of applied behavior analytic terms from English to Spanish

Why have you been asked to take part in this study?

You have been asked to participate in this study due to your bilingual abilities in English and Spanish

Who may take part in this study? And who may not?

Participants include individuals who are bilingual in English and Spanish. Board Certified Behavior Analysts (BCBAs) and those with significant experience with applied behavior analytic terms will be excluded from participation in the study. Additionally, anyone who does not consent to audio recording cannot participate in the study.

How long will the study take and how many subjects will participate?

Three subjects will participate in this study. This study will require two or three sessions with the principal investigator and will take approximately 5 hours to complete. The sessions can occur in one sitting or across multiple meetings. You can stop participating at any time without penalty.

What will you be asked to do if you take part in this research study?

You will be asked to translate multiple, short role-played conversations between a behavior analyst and a consumer from English to Spanish. Then you will be asked to study a glossary of terms before translating additional examples. You may also receive feedback on your translation.

What are the risks and/or discomforts you might experience if you take part in this study?

Participation in this study may result in boredom, and/or discomfort when receiving feedback.

Are there any benefits for you if you choose to take part in this research study?

Possible benefits may include new knowledge about applied behavior analytic terms.

However, it is possible that you might receive no direct personal benefit from taking part in this study.

What are your alternatives if you don't want to take part in this study?

You have the option of not participating in this study and will not be penalized for your decision.

How will you know if new information is learned that may affect whether you are willing to stay in this research study?

During the course of the study, you will be updated about any new information that may affect whether you are willing to continue taking part in the study. If new information is learned that may affect you after the study or your follow-up is completed, you will be contacted.

Will there be any cost to you to take part in this study?

There is no cost to you.

Will you be paid to take part in this study?

You will receive a \$50.00 gift card for taking part in this study according to the following schedule:

- \$ 25.00 at your first visit
- \$ 25.00 at completion of your participation in the study

How will information about you be kept private or confidential?

All efforts will be made to keep your personal information in your research record confidential, but total confidentiality cannot be guaranteed.

Information produced by this study will be stored in the investigator's file and identified by a code number only. The code key connecting your name to specific information about you will be kept in a separate, secure location. Information contained in your records may not be given to anyone unaffiliated with the study in a form that could identify you without your written consent, except as required by law.

In addition, audiotapes are recorded during the study that could identify you, so you must give special written permission for their use. In that case, you will be given the opportunity to view or listen, as applicable, to the audiotapes or before you give your permission for their use if you so request.

What will happen if you do not wish to take part in the study or if you later decide not to stay in the study?

Participation in this study is voluntary. You may choose not to participate, or you may change your mind at any time.

If you do not want to enter the study or decide to stop participating, your relationship with the study staff will not change, and you may do so without penalty and without loss of benefits to which you are otherwise entitled.

You may also withdraw your consent for the use of data already collected about you, but you must do this in writing to Ms. Odom (151 Ryders Lane, New Brunswick, NJ 08901.)

Who can you call if you have any questions?

If you have any questions about taking part in this study or if you feel you may have suffered a research related injury, you can call the study lead:

(Ms. Jaye Odom)

Graduate School of Applied and Professional Psychology

505-239-5225

You may also contact Ms. Odom's faculty research advisor:

Dr. Kate Fiske

Douglass Developmental Disabilities Center

848-932-4500

If you have any questions about your rights as a research subject, you can call or email:

IRB Director (732)-235-2866 New Brunswick/Piscataway

human-subjects@ored.rutgers.edu.

And

Human Subject Protection Program

732-235-8578 - New Brunswick

What are your rights if you decide to take part in this research study?

You have the right to ask questions about any part of the study at any time. You should not sign this form unless you have had a chance to ask questions and have been given answers to all of your questions.

Appendix B

Vignette 1

Hi, my name is Jaye Odom and I am the behavior analyst (1) who will be working with your son, Alex. The type of therapy we will be doing is called applied behavior analysis (2). It is evidence-based, and we will be consistently using data collection (3) to ensure it is helping Alex. The general methodology is to change Alex's behavior by changing the contingencies (4) in his environment. One way to do this is to schedule when he will receive reinforcers (5). For example, we may do backward chaining (6) if receiving them more quickly will facilitate treatment. One method we may use to help Alex gain important skills is discrete trial training (7). Once Alex has shown progress in developing skills, we will do generalization probes (8) to make sure that his new skills maintain under different circumstances. Error correction procedures (9) will be used when Alex makes mistakes. If Alex demonstrates escape-maintained behavior (10) redirection procedures will be used.

Vignette 2

Data collection (1) is essential to applied behavior analysis (2). As a behavior analyst (3), I will be monitoring the procedures we implement with your daughter, Alex. One procedure we may use to address her escape-maintained behavior (4) is to provide reinforcers (5) for on-task behavior. In order to teach your daughter new skills, we may use a backward chaining (6) or discrete trial training (7). Further, changes in contingencies (8) should aid behavior change. Generalization probes (9) will be used to check for maintenance of the changes. If Alex makes mistakes during some of the teaching programs, we may use error correction procedures (10).

Vignette 3

The goal you and the behavior analyst (1) will be working on today is reducing your son's escape-maintained behavior (2). In order to address this behavior, we will be utilizing techniques from applied behavior analysis (3). We will start by changing the contingencies (4) that are currently present in the environment. For example, we will change the current procedure to a backward chaining (5) so that he can receive reinforcers (6) more quickly. If time permits, discrete trial training (7) and error correction procedures (8) will be introduced as well. We will use data collection (9) to assess the effectiveness of the procedures. Specifically, maintenance will be assessed through data on generalization probes (10).

Vignette 4

A behavior analyst (1) is someone who utilizes the principles of applied behavior analysis (2) to help you and your child, Alex, reach goals for therapy. In order to help Alex identify different family members, we will use discrete trial training (3). Following each correct trial, Alex will receive a reinforcer (4). If Alex does not answer correctly, error correction procedures (5) will be implemented. Generalization probes (6) will be applied as necessary. These contingencies (7) should aid Alex's learning of new skills. Additionally, Alex's escape-maintained behavior (8) may be addressed by introducing a backward chaining (9). Data collection (10) will be used to assess each intervention's effectiveness.

Vignette 5

When Alex begins hitting his head against the wall, the task he is doing is removed. This is likely an example of escape-maintained behavior (1). The principles of applied behavior analysis (2) suggest a variety of methods to address this. For example, the behavior analyst (3) can design a program that delivers reinforcers (4) more quickly, such as a backward chaining (5). If this technique is not effective, we can try to rearrange other contingencies (6) in his environment. We will use different approaches for different goals. In order to help Alex learn to identify colors we will use discrete trial training (7) during which error correction procedures (8) may be used. Generalization probes (9) and data collection (10) will indicate effectiveness.

Vignette 6

Alex is doing wonderfully with discrete trial training (1). According to the behavior analyst (2) our data collection (3) indicates that he has been receiving many reinforcers (4) and few error correction procedures (5). Therefore, we will start using generalization probes (6). Additionally, we will start addressing Alex's escape-maintained behavior (7). Our first technique will involve changing contingencies (8), which is an important aspect of applied behavior analysis (9). One way we can do this by utilizing a backward chaining (10).

Vignette 7

We are going to use applied to behavior analysis (1) in order to teach Alex some new skills. For example, to make a sandwich, the behavioral analyst (2) suggests that we use a backward chaining (3). This technique will help him to receive reinforcers (4) more quickly, which will reduce his escape-maintained behavior (5). Then we will use generalization probes (6) to extend his learning to make other meals. Another way to teach Alex skills is through discrete trial training (7). If he makes a mistake, error correction procedures (8) may be used to facilitate learning. All of these procedures involve changing contingencies (9) and using data collection (10) to ensure effectiveness.

Vignette 8

Sometimes behavior analysts (1) use applied behavior analysis (2) to reduce behavior. While some of techniques are more intuitive, such as error correction procedures (3), others require more explanation and practice. It can be particularly challenging when the change in contingencies (4) seems unnatural at first. For example, backward chaining (5) involves you doing all the steps in a task except the last one, which Alex will do. This technique can help reduce escape-maintained behavior (6) and increase skill acquisition due to the increased likelihood of receiving reinforcers (7). Another way to increase Alex's ability to receive reinforcers in through discrete trial training (8), which often provides many opportunities to demonstrate learning. Generalization probes (9) will be used once mastery is achieved. Data collection (10) will happen during or immediately after all procedures are implemented.

Vignette 9

Applied behavior analysis (1) is an evidence-based treatment often used to help kids with autism. One form of evidence we will be using is data collection (2) on different methods we use. Additionally, changing contingencies (3) is often a necessary component. A behavior analyst (4) will help teach you techniques that can help reduce his symptoms and stress at home. For example, discrete trial training (5) is often used to teach children with autism better communication skills. This technique often includes providing reinforcers (6) and error correction procedures (7). After a skill is mastered, we will use generalization probes (8) to see if

it occurs under a variety of circumstances. A second technique we may use is a backward chaining (9) in order to decrease Alex's escape-maintained behavior (10).

Vignette 10

Now that we have reduced Alex's escape-maintained behavior (1), the behavior analyst (2) is going to use a different technique from applied behavior analysis (3) to help him build skills. Two common approaches are discrete trial training (4) and backward chaining (5). Both techniques involve receiving reinforcers (6) and error correction procedures (7). Similarly to the prior intervention, we will use data collection (8) to monitor the effects of treatment. If these contingencies (9) result in successful skill acquisition, we will use generalization probes (10) to determine if he can communicate with new people too.

Appendix C

Glossary

10 ABA words

1. Reforzador (reinforcer)
2. Análisis aplicado de la conducta o análisis de la conducta aplicada (applied behavior analysis)
3. Encadenamiento hacia atrás o encadenamiento retrógrado (Backward chaining)
4. Analista de conducta (Behavior analyst)
5. Contingencia (Contingency)
6. Procedimiento de corrección (correction procedure)
7. Toma de datos (data collection)
8. Enseñanza de ensayos discretos (discrete trial training)
9. Conducta mantenida por escape (escape maintained behavior)
10. Sondeo de generalización (generalization probe)