Measuring Early Communication in Spanish Speaking Children: The Communication Complexity Scale in Peru

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Abstract: *Background*: There is a great need in the United States to develop presymbolic evaluation tools that are widely available and accurate for individuals that come from a bilingual and/or multicultural setting. The Communication Complexity Scale (CCS) is a measure that evaluates expressive presymbolic communication including gestures, vocalizations and eye gaze. Studying the effectiveness of this tool in a Spanish speaking environment was undertaken to determine the applicability of the CCS with Spanish speaking children.

Methods & Procedures: In 2011-2012, researchers from the University of Kansas and Centro Ann Sullivan del Perú (CASP) investigated communication in a cohort of 71 young Spanish speaking children with developmental disabilities and a documented history of self-injurious, stereotyped and aggressive behaviors. Communication was assessed first by parental report with translated versions of the Communication and Symbolic Behavior Scales (CSBS), a well-known assessment of early communication, and then eleven months later with the CCS.

Hypothesis: We hypothesized that the CCS and CSBS measures would be significantly correlated in this population of Spanish speaking children.

Outcomes & Results: The CSBS scores from time 1 with a mean participant age of 41 months were determined to have a strong positive relationship to the CCS scores obtained at time 2 with a mean participant age of 52 months.

Conclusions & Implications: The CCS is strongly correlated to a widely accepted measure of early communication. These findings support the validity of the Spanish version of the CCS and demonstrate its usefulness for children from another culture and for children in a Spanish speaking environment.

Keywords: Autism, disabilities, assessment, presymbolic, Spanish.

INTRODUCTION

There has always been a need for measures that can reliably assess the communication abilities of children with severe language difficulties. Over the years, the communication field has developed and more tools are widely available to assess the presymbolic abilities of individuals. However, the great majority of these assessments are available only to English speaking children, but in the increasingly interconnected and culturally diverse world that we now live in, it is necessary to develop measures that can assess the communication of children who come from a variety of backgrounds and speak languages other than English.

Presymbolic Communication Development

Extensive research has focused on communication development during the presymbolic period of development in many groups and populations, which includes communication such as gestures, vocalizations and eye gazes but excludes symbolic gestures such as signs. Bates and colleagues documented the progression of presymbolic communication in typically developing children and found a relationship between this progression and later language and symbol use [1-3]. Communication progression generally starts with preintentional (also known as perlocutionary) communication. Preintentional communication is marked by purposeful behaviors that are not clearly directed to another individual—for example, crying without any gestures or eye gaze. Next in the progression of early communication development is intentional communication; that is, purposeful gestures and vocalizations that are clearly directed toward another person, such as pointing toward an object and looking at an individual to indicate an interest in that object. Intentional communication is followed by the development of symbolic communication which is primarily marked by the use of spoken words.

Some interventions have attempted to target presymbolic behaviors as a means for improving language outcomes (examples are [4-6]). These interventions require reliable methods to describe presymbolic behaviors in order to assess baselines and subsequently plan or modify interventions. Additionally, it is vital to have tools that measure presymbolic communication in order to describe an individual's current communication status and monitor changes

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that may occur over time. These changes could be associated with a particular treatment or a change in the underlying condition associated with the communication disorder.

The ability to effectively measure presymbolic communication also allows for predictions to be made based on a child's progression through developmental stages. Patterns can be noticed for specific populations before they would otherwise be observable. For example, studies have shown that deaf-blind children have difficulties showing interest in events and objects *via* conventional means such as eye gaze or pointing; however, they may communicate interest in other ways, such as with body orientations or physical manipulations [7-9].

Parameters of Presymbolic Communication

There are two main parameters of presymbolic communication that show change during development: attention shifting and form of communication [10, 11]. A shift in attention indicates that the individual (which can be an infant or an older child with developmental disabilities) is directing his behaviors at a communication partner [12-15]. A major milestone of development is when an individual learns to pair a potentially communicative behavior (PCB) such as crying with an attention shifting behavior such as a shift in eye gaze to the communication partner. This indicates that the individual is intentionally directing his communication attempt at his communication partner. The communication becomes intentional as the child starts to consistently pair shifts towards his communication partner with PCBs [10, 16-18].

During typical early communication development, the form of communication becomes more varied. For the first few months of life, children are limited by their motor development as to what forms they can use, but as the child progresses into the first and second years, motor development allows them to use a wider variety of gestures and vocalizations. Early gestures typically involve direct contact with another person while later gestures include representational gestures such as shrugging for "I don't know" and pointing toward an object rather than directly touching them [11, 19-21].

Assessing Presymbolic Communication

It can be difficult to accurately assess presymbolic communication. The stages of presymbolic communication are brief in children who are typically developing and who tend to progress very quickly from presymbolic communication into word use. Of the very few measures that do exist for this time period, most rely on caregiver report. For example, both the Mullen Scales of Early Learning [22] and the Communication and Symbolic Behavior Scales Developmental Profile-Caregiver Interview [23] include questions about presymbolic behaviors; however neither attempts to look in-depth at this progression and both rely on parent or caregiver report to obtain this information. Adding information from direct observation to caregiver report can provide a more complete picture of presymbolic communication. However, systematic means to describe results from direct observations are currently lacking. Research studies have focused on the rates of communication [16, 24, 25] and frequencies of different forms or functions of communication [21, 26, 27]. These measures do not, however, measure presymbolic communication level in a way that can both reflect a developmental progression and be consistently applied across participants.

The Need for a Culturally Sensitive Assessment

The majority of assessments for presymbolic children occur in the schools or at least through a designated program connected to the school system. In the last 20 years, schools in the United States have become more ethnically and culturally diverse [28]. As such, it is important that assessments and measures used to determine an individual's communication skills are examined for their ability to measure language and development without cultural and linguistic biases. Many current assessment models recommend moving away from standardized testing for children who come from culturally and linguistically diverse populations in favor of more dynamic assessments [29-31]. These models require using multiple measures, procedures, and contexts so as to gain as much data as possible about the individual. Many also emphasize the importance of testing the child in all of the languages they can speak or understand [32, 33].

It is important for clinicians to realize that minority populations are often minimally represented or not present in normative samples for standardized assessments used in the United States. This is because the population that the assessment evaluated as its normative group generally reflects the population of the United States, meaning that white, middle class speakers of Standard American English make up the majority of the group [34]. This can mean that the standardized scores provided by the assessment could

be skewed for these populations, as the normative sample does not account for cultural nuances. Without research on culturally diverse populations, it may not be appropriate to use these measures for a client who is culturally and linguistically diverse.

It is also important to note that not only are these students underrepresented, children from culturally and linguistically diverse populations are often over-represented in special education. Sullivan [35] found that in one state English language learners (ELL) were more likely to be diagnosed with specific learning disabilities, mild intellectual disabilities, and speech-language impairments. Representative, culturally appropriate assessments can help reveal the degree of language differences which are explained by cultural differences as opposed to language impairments.

There are many issues to consider in the development of a culturally and linguistically sensitive measure. First, it is important to recognize that a mere translation of an assessment is not sufficient to guarantee that a measure is non-biased or accurate. For example, a truly representative Spanish translation of an assessment would reflect the dialect and culture of the particular region where it is being administered because there are significant differences in word choice between native speakers from different countries. Additionally, translated tests are different from their source language counterparts, so when translating, one has to ensure that the changes are not dramatic enough to change the psychometric properties of the test [36]. To make sure that tests are valid and reliable across many cultures, developers must make sure that the construct being measured is present and can be measured consistently in each relevant culture. Furthermore, items being compared across cultural and linguistic groups must be statistically equivalent [37].

Second, when developing culturally and linguistically sensitive measures, great care must be taken to avoid biases. There are four primary kinds of test bias that could negatively impact the test scores of children who are culturally or linguistically diverse from the test population: linguistic, format, value, and situational biases [32, 38]. Linguistic bias occurs when there are sounds, or types of grammar, syntax, or morphology, that do not exist in the test taker's language. Format bias is present when the test has items that the client is not familiar with or has never been exposed to. Value bias happens when two populations may answer a test item differently but one population's "accurate" answer is afforded more points. Finally, situational bias occurs when the testing environment has an impact on the child's performance because of a cultural or linguistic feature. These biases can at least partially be avoided by having a diverse normative sample that represents many different cultures, linguistic backgrounds, and socioeconomic statuses.

Currently Available Assessments

At the time of writing this paper, we found no observationally-based tools that are able to accurately assess early communication skills in culturally and linguistically diverse populations. The tools that do exist for Spanish speaking children reflect the same dilemmas mentioned above in the discussion of measures of presymbolic communication. They either do not cover the years of typical presymbolic communication at all or they only briefly touch on the presymbolic period. Table **1** lists some of the assessments listed for early language or developmental assessment in the American Speech-Language-Hearing Association's Directory of Speech-Language Pathology Assessment Instruments [39]. Only one measure in this list, the Rossetti Infant-Toddler Language Scale, uses observational information as part of the assessment—the other assessments are parent report measures. In light of these limitations, current guidance recommends focusing on universally shared aspects of language development when working with children in the prelinguistic stage [32].

Some attempts have been made to adapt the traditional linguistic assessments for use in other cultures. The Ages and Stages Questionnaire (ASQ) has been adapted for use in Brazil. Filguerias *et al.* [40] examined the psychometric properties of the adaptation. The researchers asked 468 public daycare center providers to fill out assessments for children between the ages of 4-60 months. They found that the reliability of the translated measure was similar to the original English version. However, adjustments were needed to reflect cultural differences. For example, one item asked whether or not the child could use a fork; however, in Brazilian childcare children are typically not allowed to use forks for safety reasons.

The Communication Matrix [41] and the MacArthur-Bates Communicative Development Inventories (CDI) [42] are two additional assessments completed by parents or other caregivers that have been translated

into Spanish. The Communication Matrix is designed to evaluate the expressive communication skills for children with severe disabilities. It is organized into seven levels of communication, all of which measure presymbolic stages. This study has been validated in English speaking infants, and while it has been translated online into Spanish, we could not find any studies examining the validity of this tool in another language. The CDI uses parent report forms to assess language and communication in young children. The Spanish translation was validated in a norming study that included both English and Spanish speaking children in a metropolitan area of the United States [43].

For the current study, performance on two measures of early communication were compared. The Communication and Symbolic Behavior Scales Caregiver Questionnaire (CSBS) has been identified as a valid, informative assessment used to measure presymbolic and beginning symbolic communication [23]. The administration of this test includes a four-page caregiver questionnaire organized around a parent's report of his or her child's communication skills, expressive speech and symbolic behavior. The raw score is computed by summing the child's score across 22 communication and symbolic rating scales grouped into seven clusters.

After conducting a literature search to determine whether the CSBS had been used in international situations with populations that did not speak English, we were unable to identify any such studies. It does not appear that the CSBS has been translated to any other language, which is a major barrier for students who come from linguistically diverse backgrounds in the United States and for educators that would like to use this assessment in other countries where English is not the primary language.

The Communication Complexity Scale (CCS), created in 2012, has been validated as a tool to measure presymbolic communication in English speaking children. It includes a series of 12 one-on-one scripted interactions used to measure presymbolic stages of development [44]. Reliability for the CCS has previously been obtained with three different English speaking research populations of varying ages. The CCS has also been compared to other measures of presymbolic communication and appears to accurately describe levels of early communication. In order to utilize both the CSBS and the CCS in the current study,

Table 1: Assessments Available for Early Communication in Spanish Speaking Children

Assessment	Authors	Year	Report Type	Age Range	Areas Assessed
Ages and Stages Questionnaires	Bricker and Squires	1999	Parent report	4m-5y	Communication, gross motor, fine motor, problem solving, personal-social
Bilingual Health and Developmental History Questionnaire	Gomez-Valdez	1985	Parent report	3y-11y	Acquisition of milestones, health history, developmental history, communication problems, information about family customs
Bilingual Language Proficiency Questionnaire	Mattes & Santiago	1985	Parent report	3y+	Developmental history, functional use of language in both English and Spanish
Primer PASO	Miller	2003	Screener	2;9-6;2	Cognition, communication, motor screener
Individual Growth and Development Indicators-Early Literacy	McConnell, McEvoy, Priest & Missall	1998-2001	Performance measure	Birth-3y	Communication, movement/motor, social competency, problem solving, parent-child interaction
Prescreening Developmental Questionnaire	Frakenburg	1998	Parent report	Birth-6y	Developmental growth
Rossetti Infant-Toddler Language Scale	Rossetti	2006	Observation, elicitation & parent report	Birth-3y	Preverbal skills, verbal language development
Preschool Language Scale, 5th Edition, Spanish Edition	Zimmerman, Steiner & Pond	2012	Observation, elicitation & parent report	Birth-7;11	Receptive and expressive language

The material for Table **1** was derived from the American Speech Language Hearing Association (http://www.asha.org/assessments.aspx).

the protocols were translated into Spanish. The description of this process can be found in the Methods section below.

Purpose of the Current Study

As discussed previously, there are several options available to measure presymbolic, early communication in children from English speaking homes. As the United States becomes more culturally and linguistically diverse, however, it is necessary to develop assessments for use in Spanish speaking populations as well. Furthermore, thanks to advances in technology and communication, it is easier to share educational resources and research across the world, but these assessment measures need to be linguistically appropriate in order to be accurately utilized across countries. Considering all of these aspects, we posed the research question: Is the Communication Complexity Scale (CCS) valid for measuring early communication in a Spanish speaking country? Specifically, we looked at the validity of the CCS by comparing performance on it to data from a well-known measure of early communication—the CSBS Caregiver Questionnaire.

METHODS

Participants

A cohort of 71 children ages 30 to 74 months from Lima, Peru with developmental disabilities and a documented history of challenging behaviors (self-injurious behavior, stereotyped behavior, and/or aggressive behavior) were selected to participate in this study. The participants were previously identified through a mass screening project that identified 262 children with behavioral problems in Lima, Peru from 2010-2012 [45, 46]. The 71 children included in this cohort were originally involved in the mass screening project and agreed to participate in this follow-up study. All data was collected at CASP from November 2011-November 2012. The sample included 45 males and 26 females with average chronological age of 41 months at the time of the initial screening. 26 children had a diagnosis of Autism, 23 children had Down syndrome, 16 were identified as having some type of cognitive deficiency, three children had a genetic syndrome, two children had no diagnosis and one child had Cerebral Palsy.

Participants' cognitive levels had been determined prior to this study using the Bayley Scales of Infant and Toddler Development (described below) [47] The Bayley was administered one year before Time 1 in September 2010 as part of the parent mass screening project. 68 children were evaluated, as 3 children were unable to complete the test. Most of the children showed cognitive delays. The cognitive standard score for this group of individuals had a range of 1-11 and an average score of 4.6 with a standard deviation of 2.8. 47% of the children tested had a cognitive standard score lower than two standard deviations from the mean, with a percentile rank of 2% or less when compared to the norm-standardized group of children. 4% of the participants were at the 50% percentile rank or above, indicating average or slightly above average cognitive development when compared to the standardized group.

Translation of the CSBS and CCS

In order to use the measures described above in the current study, they had to first be translated from English to Spanish. The CSBS was translated into Spanish by native Spanish speakers from Peru. The translators ensured that the questions were culturally and grammatically appropriate for Peruvian families. For example, one section of the CSBS asks the parents what sounds the child makes. In the English version, one of the sounds listed is "sh" such as "shush" or "shasha," but this sound does not exist in Spanish, so that example was completely eliminated from the Spanish version of the CSBS. Another question asks the parent if the child uses a bottle to pretend to feed a baby. The direct translation of the word bottle, "botella," seemed odd to parents, so we had to make sure the word that was used was the more colloquial term, "taza," instead. This translation was approved before administration to families by the CSBS publisher, the Paul H. Brookes Publishing Company.

The CCS evaluation rubric and administration script were also translated into Spanish by a native Peruvian and reviewed for syntax and grammar by several Peruvian colleagues. The toys that were utilized were all purchased in Peru in order to be culturally and age-appropriate. The toys were similar to those used in the English studies with minor variations. For example, the books we used were all purchased in the neighborhood markets to ensure that the movie or characters depicted would be familiar to the Peruvian children. The wind-up toys that were used in the English versions were usually some sort of monkey, but in Peru the most popular version of this toy were chickens. An additional change in administration involved the use of

graphic symbols. Although Brady and colleagues made graphic symbols available to children in the US study [44], these symbols were not typically used in Peruvian schools or homes and hence were not included in the Peruvian assessments. The researcher who administered the test was trained in English and Spanish and practiced the exam with typically developing Peruvian children before administering it to the children in this study.

We also needed to ensure that the scoring system would be the same across languages. Children only receive credit for speaking an actual word as opposed to a sound if the researcher, who was proficient in Spanish, could understand the word the child pronounced (without the parent or sibling explaining what the child was trying to say). During the administration of the assessment, several children said what sounded like "yo," which means "I/me" in Spanish, but it was difficult to determine if the child was just saying "o" like the sound or actually trying to speak, hence credit was generally not given for a word in these cases. Examples like these were handled on a case-by-case basis and the individuals reviewing the video decided whether the child's sound was an intentional word or just a noise that sounded similar to a common word.

Measures

The translated version of the CSBS Caregiver interview was administered to the families at time 1. Parents worked with an interviewer to complete a four-page caregiver questionnaire that included questions about the child's communication skills, expressive speech and symbolic behavior. Raw scores were used in our analyses because children were older than the standardization sample for the CSBS, and because raw scores are more reflective of level of communication skill attainment by each child (c.f., [48]).

The translated version of the CCS was administered to children approximately one year after the CSBS assessment. The CCS includes a series of 12 one-on-one scripted interactions used to measure presymbolic stages of development [44]. As shown in Table **2**, children are assessed across different activities that require the child to either request something from the examiner or react in some way to the activity (*via* a comment or gesture for example). For example, the

Table 2: CCS Protocol-Spanish

CCS Protocol-Spanish		
Function	**Activity**	**Description**
Requesting	Wind-up toy	Examiner brings out wind-up toys (chickens) and makes one walk across the table. Examiner gives broken wind-up toy to participant.
Requesting	Prickly Toy	Examiner opens a container with a textured toy and plays with it in front of the participant. The Examiner then closes the container tightly and offers it to the participant.
Requesting	Hammer	Examiner brings out two battery operated hammers. Examiner hits hammer on table to make noise and offers a hammer without batteries to the participant.
Requesting	Train	Examiner starts playing with train and builds individual track but only gives participant one track piece.
Requesting	Bubbles	Examiner blows bubbles and offers a container of bubbles with a sealed lid to the participant.
Requesting	Bumble Balls	Examiner brings out two bumble balls and activates one. The examiner offers another bumble ball without batteries to the participant.
Commenting	Ball Toy	Examiner brings out a ball toy and offers balls to participant to put in the toy. Then a ball that is too big is offered.
Commenting	Blocks	Examiner takes a few blocks out of a container and offers some blocks to the participant. Examiner secretly places a spider in the container and offers more blocks.
Commenting	Musical Instruments	Examiner brings out multiple Peruvian musical instruments and offers them to the participant.
Commenting	Coloring	Examiner offers markers to participant to draw with and secretly places a fake hot dog in the box.
Commenting	Books	Examiner brings out two children's books and looks through them with the participant. One book is intact and the other has had pages altered.
Commenting	Fan	Examiner uses a hidden switch to activate a fan that has been sitting inactivated in the participant's line of sight.

examiner plays with a bottle of bubbles and then hands a sealed bottle to the child in the hopes that the child will request help with opening the bottle *via* a gesture or vocalization. In another task, the examiner presents a Tupperware container full of blocks with a fake spider placed inside to see if the child will try to direct the examiner's attention toward the object (comment). Each task is designed to either initiate a request or comment *via* presymbolic communication forms such as gestures or vocalizations. See Table **2** for a brief description of the scripted interactions used in this study.

Videotaped interactions between the experimenter and child were scored later using the procedures developed by Brady and colleagues [44]. Children receive a raw score of 0-11 for each activity, ranging from no attempt at communication to use of two-word phrases. A brief definition of each score is provided in Table **3**. The most advanced communication attempt is recorded as the final score for each individual activity. For example, if a child communicated a request for help during the broken hammer task by handing the hammer back to the experimenter, then said "roto" (broken) a few seconds later, only the spoken word would be scored because it is a higher level response. The composite score for each individual is determined by calculating the average of the top three scores. This value was calculated because some children responded to certain tasks with lower levels of communication and an overall mean could be misleading [44]. Reliability of coding the CCS was determined by having an independent coder code 19 randomly selected videos. In each of the 19 videos, the CCS scores from the two coders were within one point on the 12 point scale, indicating high inter-observer reliability.

Data Analysis

Results from the experimental measure, the CCS, were compared to results from a frequently used

Table 3: Communication Complexity Scale Scoring Rubric

CCS Scores-Spanish			
Number	**Definition**	**Communication Level**	**Example**
0	No response		
1	Alerting-a change in behavior, or stops doing behavior	Preintentional	Child changes behavior in some way in response to toy being presented
2	Single orientation only-on an object, event or person; can be communicated through vision, body orientation, or other means	Preintentional	Child looks at toy
3	Single orientation only + 1 other PCB (potentially communicative behavior)	Preintentional	Child looks at toy and makes sound
4	Single orientation only + more than 1 PCB	Preintentional	Child looks at toy and makes sound + points toward toy
5	Dual orientation-shift in focus between a person and an object, between a person and an event using vision, body orientation, etc (without PCB)	Preintentional	Child looks at toy and then at test administrator
6	Triadic orientation (e.g. eye gaze or touch from object to person and back)	Intentional Non-Symbolic	Child looks at toy, then at test administrator, then back again at toy
7	Dual orientation + 1 PCB (e.g., dual focus + gesture)	Intentional Non-Symbolic	Child shifts attention between toys or between toy and administrator + points
8	Dual orientation + 2 or more PCB (e.g., dual focus + gesture + vocalization, switch closure)	Intentional Non-Symbolic	Child shifts attention between toys or between toy and administrator + points + makes sound
9	Triadic orientation + 1 PCB (e.g. triadic + vocalization)	Intentional Non-Symbolic	Child looks at toy, then at test administrator, then back again at toy + makes noise
10	Triadic orientation plus more than 1 PCB (e.g. triadic plus vocalization and differential switch closure)	Intentional Non-Symbolic	Child looks at toy, then at test administrator, then back again at toy + makes noise and points
11	One-word verbalization, sign or AAC symbol selection	Intentional Symbolic	Child says word

standard measure of early communication, the CSBS. The CCS was administered approximately one year after the CSBS due to the scheduling of tests included in the longitudinal study of challenging behaviors. Although the time lag is not ideal, comparing the two tests reflects construct validity of the CCS as well as predictive validity of the CSBS. We compared children's early communication reported by parents with the translated version of the CSBS Caregiver Questionnaire to the communication we observed and coded one year later with the translated version of the CCS.

RESULTS

The Pearson correlation coefficient was used to determine the linear correlation between the CSBS raw score and the CCS composite scores. The CSBS scores ranged from 14.5 to 128 with a standard deviation of 29.7. This large spread of raw scores was expected due to the ranges of chronological ages and cognitive scores. The mean value for the CSBS raw score was 85.5.

The CCS scores ranged from 1.33 to 11 and a standard deviation of 2.1 and a mean score of 8.5. Again, the variability was expected and is necessary in order to determine if the scores from the CCS correlate significantly with scores from the CSBS.

The relationship between the two communication measures were evaluated with the Pearson Correlation Coefficient. The CSBS scores were determined to have a strong positive relationship to the CCS scores (Pearson r =.685, p <.000). Figure **1** shows a scatterplot of results on each test for each participant in this study, along with a superimposed trend line. A number of participants' scores on the CCS were at the highest level possible [11]. Thus, results were somewhat influenced by ceiling effects. In general, however, it is apparent that there is a direct relationship between these two measures. Children with higher scores on the CCS also had higher scores on the CSBS.

DISCUSSION

In this study we found a strong relationship between the CSBS and the CCS. This is signification because this correlation demonstrates the connection between the two assessments, further validating the CCS as a presymbolic communication assessment. Furthermore, the results demonstrate the utility and potential applicability of these assessments in a Spanish speaking setting. The CCS has previously been validated in English as a reliable assessment that can be utilized in children and adults with presymbolic communication levels, and this study suggests that the Spanish version could be utilized for measuring

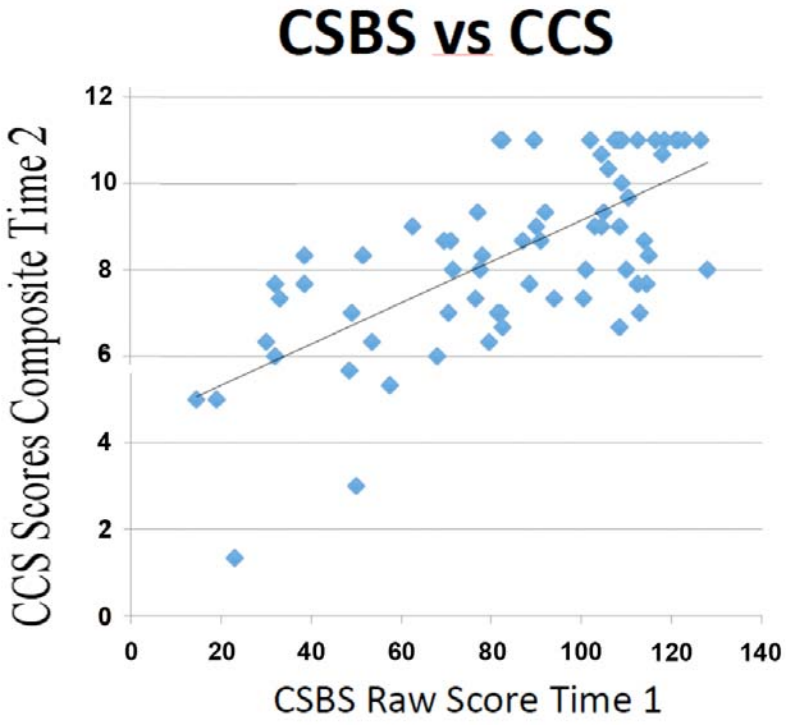

Figure 1: Results of CSBS Scores Time 1 compared to CCS Scores Time 2.

presymbolic communication in Spanish speaking children. In addition, our translated version of the CSBS may provide a valuable resource because combining assessment information from multiple sources including parent report and direct assessment is considered beneficial [49, 50].

While these findings demonstrate the utility of the translated CCS for measuring early communication in Spanish speaking children, it is necessary to expand the resources available to conduct assessments of early communication for individuals from culturally and linguistically diverse backgrounds in the United States and elsewhere. If the CSBS can be accurately translated by a native speaker as was done in this study in order to accurately represent country-specific words and expressions, this could be a new assessment tool for researchers and care providers to use outside the United States. With the CCS, the administration of different tasks with the child will need to be adapted to reflect cultural and linguistic variations as was done in this study. However, the scoring scale should be straightforward when translated across languages or could remain in English if the test administrator is bilingual. If a research assistant or teacher can be appropriately trained on the proper terminology and phrases to utilize while administering the assessment, then the CCS has potential to be utilized in a variety of linguistically-diverse settings as well.

LIMITATIONS OF THE CURRENT STUDY

While this study demonstrated a correlation between the CSBS and CCS scores, there were several limitations that could impact the strength of our results. First, all CCS items were administered in Spanish by a fluent but non-native Spanish speaker. Even though the assessment was recorded and practiced on typically developing children beforehand and subsequently reviewed by Peruvian educators, there could still be syntax or pronunciation differences that affected a child's comprehension throughout the administration of the CCS. Second, this study included children that had already participated in a two-year study looking at other aspects of their development. The parents had previously responded to a variety of surveys and questionnaires throughout the process, so their reporting of their child's communication abilities could have been skewed as a result of the repetitive nature of these tests. Third, the sample was not balanced between genders. Fourth, the gap time of one year between the administration of the CSBS and the CCS is not ideal for comparing the two measures, as a child's communication abilities could have changed during that time period. Finally, our assessments were only administered to children from the Lima metropolitan area, so its applicability to other parts of Peru and beyond is limited. It would be important to research whether one translation would be sufficient for an entire country or if additional modifications are needed to reflect cultural and linguistic differences across cities or regions within a country.

FUTURE DIRECTIONS

This study offers many possibilities for future research. It will be important to replicate this study with a greater number of participants in a different Spanish speaking country, as well as in the United States. Taking it a step further, bilingual children from a mixed classroom of English and Spanish speakers could be given English and Spanish versions in order to compare the results obtained from each version. It would also be interesting to replicate this study with children and adults of varying ages. The CCS has been validated across a wide range of ages, but it would be important to ensure that the translated versions could be utilized across different-aged populations as well. Thus, this study should be considered an initial step in a larger, more comprehensive effort to validate the CCS in non-English speaking populations.

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