Voice & Swallow Mechanics Lab

Assessment Bias in Speech Sound Disorders

AUTHORS: MICHELLE LEÓN PH.D. CCC-SLP
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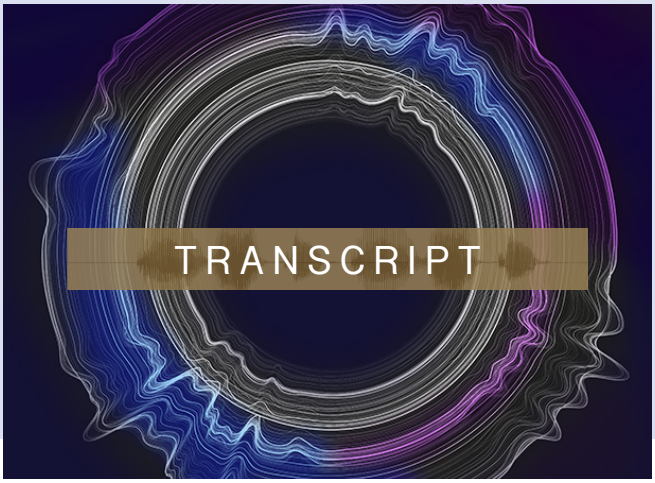

	TIME (MM:SS)	TRANSCRIPT PAGE 1/6
1	00:00 — 00:29	***Dr. Michelle León Ph.D. CCC-SLP:*** Hi everybody. Welcome to Culturally Inclusive Education for the Speech Sciences. My name is Michelle León. I am an adjunct instructor at the University of Cincinnati in the Department of Communication Sciences and Disorders, and I will be presenting today with Dr. Amy Hobek, an associate professor in the same university and the same department. And today, we will be discussing assessment bias in speech sound disorders.
2	00:30 — 00:47	This module series is funded by the Advancing Academic-Research Careers Award from the American Speech-Language-Hearing Association, or ASHA, and the College of Allied Health Sciences at the University of Cincinnati.
3	00:48 — 01:19	This presentation will discuss speech sound differences in dialects of American English and bilingual speakers. Then, we'll talk about why and how we use standardized assessments in the field of Speech-Language Pathology. And finally, Dr. Amy Hobek will discuss biases in speech sound assessments including normative sampling and concerns for misdiagnoses of culturally and linguistically diverse populations.
4	01:20 — 02:01	This module series assumes some prerequisite knowledge, including definitions of dialects and bilingualism, in addition to some familiarity with varying phonological systems based on different languages and dialects. The learning objectives of this module are to understand that languages and dialects are rule-governed systems and to identify potential biases of standardized assessments, and finally to identify concerns for speech sound disorders misdiagnoses in culturally and linguistically diverse populations. There are no additional funding disclosures.
5	02:02 — 02:07	Now we'll begin discussing speech sound differences.
6	02:07 — 02:31	Before we define dialects, I want you to take a moment to look over this quote. Specifically, the area that's in bold that says, *"To speak a language is to speak some dialect of that language."* It's important that we remember that any variety of a language spoken by a group of speakers, including what's preferred socially, is in fact a dialect.
7	02:32 — 03:05	So, what are dialects? Dialects are systematic variations of a language that's spoken by a group of people; and again, to reiterate, these are legitimate rule-governed language systems. Some examples of American English dialects include General American English, which is what we will refer to as more of that standard English that we can hear in more academic settings for example. We also have African American English, Chicano English, Appalachian English, and so forth.
8	03:06 — 05:00	Because each dialect may have variations in its phonological system and therefore different phonological processes, there may be some speech sound differences that could be heard. These dialectical rules are applied across all linguistic parameters. So, for example, they could be heard phonologically, morphologically, and so forth. Some examples of African American English features include the third person singular *"s"* absence. For example: *"He thinks he look cool."* There could also be the dropping of the rhotic consonant *"r."* So for example, producing the word *"for"* without that final *"r"* consonant. There could also be a metathesis. So, for example *"ax"* instead of the word *"ask."* And another example and feature of Midwestern dialects could include a reduction or absence of the /ɜ/ sound. So, these features follow rules within their dialects. Meaning these different features are not incorrect within the rule-governed system of their dialects. We should be cautious of some assumptions that can come with dialects. Including the assumption that someone is automatically a speaker of a dialect just because they belong to a certain community. Another assumption is that speaker of dialects are also bidialectal, meaning that they speak two or more dialects. It's important not to assume this because we can't assume that a speaker automatically speaks the mainstream dialect. In our case we refer to that as General American English. If a speaker is bidialectal though, we can expect to see or hear some code-switching, which means that the speaker will alternate between two or more dialects. And again, this is not an incorrect production or feature.

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9	05:01 — 05:16	***Dr. Michelle León Ph.D. CCC-SLP (cont.):*** We'll now shift to discussing about bilingualism. This is a general definition for bilingualism, and it indicates that a person is bilingual if they're able to comprehend and/or produce two or more languages.
10	05:16 — 07:15	There can be individual variability among bilingual speakers, such as the exposure to the different languages. This could have been simultaneously, meaning around the same age or around the same time, or sequentially, meaning they had exposure and a foundation to one language before getting exposed to the second language afterward. It is typical to see cross-linguistic effects or transfer. And these effects can occur at all levels of language, such as the phonological, lexical, semantic, and so forth. These transfer effects can also be positive or negative, meaning that they'll either facilitate or impede the language performance. Bilingual patterns of speech may differ from monolingual children. For example, there may be some differences in the mastery of consonants, which is based on the language. And some phonological rules may overlap or be mutually exclusive depending on the similarity of the language systems. On the right, you can see two Venn diagrams that compare different consonant and vowel phonemes of different languages with the English phonological system. Bilingual speech patterns may exhibit features that resemble patterns seen in people with speech sound disorders such as reduced intelligibility to the listener, meaning they're not understood as well. Now although the prevalence of speech sound disorders is similar in monolingual and multilingual populations, there's actually a higher concern and possible misdiagnosis among these bilingual or multilingual populations. Now a main consideration to keep in mind is that if a bilingual speaker has a speech sound disorder, there will be atypical errors or difficulties in both, or all of the languages spoken by that person.
11	07:16 — 07:31	Before moving on to discussing about standardized assessments, I want you to think about how these speech sound differences could impact a culturally and linguistically diverse speaker during a speech assessment.
12	07:32 — 07:36	*[Section Divider Slide. No audio]*
13	07:37 — 08:14	Standardized assessments are often used to diagnose speech sound disorders. And having assessments that correctly diagnose speech sound disorders are important because these speech sound disorders can have lifelong effects, including academically and professionally. Assessment tools are also used to support the planning for intervention needs. And lastly, tools used should accurately identify features indicative of a speech difference such as those that can be seen in bidialectal and bilingual speakers from features that are indicative of these speech sound disorders.
14	08:15 — 09:13	Speech sound assessments are completed by speech-language pathologists, or SLPs, often times using norm-reference, standardized assessment tools usually at the single word level. These tools compare the performance of the speaker with a standard target performance. The third addition of the Goldman-Fristoe Test of Articulation can be seen to your right, which is a widely used assessment tool followed by the Khan Lewis Phonological Analysis tool. Additionally, SLPs often estimate the intelligibility of the speaker. Then, they evaluate whether the person can imitate the correct production of a speech sound being assessed. Lastly, oral motor examinations are often conducted. Although assessments should target all of the person's languages, to ensure reliable diagnosis, standardized assessments are frequently conducted in the mainstream language in a monolingual fashion.

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15 09:14 — 11:43	***Dr. Michelle León Ph.D. CCC-SLP (cont.):*** One speech sound assessment tool is the Diagnostic Evaluation of Articulation and Phonology, also known as the DEAP. It has an articulation subtest, which assesses articulation skills for children between the ages of 3 and 8 years old and 11 months. It was developed for monolingual English speakers. Jamaicans are mostly bilinguals due to exposure to both Jamaican Creole and English languages from birth. The post-Creole continuum ranges from the English to Jamaican Creole languages, each containing distinct differences. Previous research has applied knowledge of the post-Creole continuum to develop a culturally and linguistically adapted protocol of the DEAP, including the articulation subtest. On the slide, you can see on the left what the original protocol would include for some of the words. For example, *"pig"* would include the production of /pɪg/ and *"watch"* would include the expected production of /wɑtʃ/. However, when applying the culturally adapted protocol you can see that there are various options for one word. For example, for *"pig"* we have acceptable responses that include: /pɪg/, /pig/, /pɪgɪ/, /pigi/. The adapted DEAP protocol was developed based on adult speech sound productions in Jamaican Creole and English to reflect the post-Creole continuum, integrating culturally adapted responses such as lexical and phonological variations. It accounts for the Jamaican phonological system, which consists of 22 consonants and 12 vowels, differing in quantity from the English phonological system, which contains 24 consonants and 20 vowels. The culturally adapted protocol contains an increased number of appropriate English-to-Jamaican Creole responses, which in hope would reduce the likelihood of misinterpreting some of these responses as errors.
16 11:44 — 14:09	Acoustic measures and analysis can help us understand how bilingual children articulate and produce sounds when speaking different languages. By using acoustic techniques, we can gain valuable insights into the specific differences that bilingual children use when communicating. The results of such analyses can provide useful information to guide educational, research, and intervention practices and improve language development outcomes. Do you think that culturally responsive assessment practices can improve overall speech assessment practices for bilingual populations, including when using acoustic measures and analysis? How so? A recent study focused on Jamaican Creole-English speakers, and they found that adapting protocols to account for the linguistic and cultural differences is more effective in capturing a wider range of linguistic variation and, therefore, providing more accurate representations of their speech sound productions. The study recommends using adapted scoring as a best practice for populations where children use more than one language on a daily basis. It is crucial to accurately represent the speech abilities of bilingual children to avoid misdiagnosis of communication disorders. Their linguistic capabilities should not be ignored. With this in mind, it is essential to adopt culturally responsive assessment practices to ensure more accurate speech assessments for bilingual populations. For example, what we can see on these images, we can see that there is a prolongation of the vowel duration in the word */pig/*. This is considered a typical characteristic in Jamaican Creole-English speakers; however, that is not something that we'll see in some monolingual populations. By us knowing that this is a typical characteristic and, therefore, that we should expect this, we could then avoid misdiagnoses of this elongated vowel.
17 14:10 — 14:34	***Dr. Amy Hobek Ph.D. CCC-SLP:*** Hello everyone, my name is Dr. Amy Hobek and I will be continuing the remainder of this presentation. So now we're going to talk about the potential bias that could occur when an administering the speech sound assessment, especially when they are used with children who come from different cultural and linguistic backgrounds than mainstream American English.

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TIME (MM:SS)	TRANSCRIPT PAGE 4/6
18 14:35 — 15:26	***Dr. Amy Hobek Ph.D. CCC-SLP (cont.):*** First, we'll talk about normative sampling in test development. When test developers are developing their tests, they need to standardize the test to determine what are typical skills for a population, depending on what skills the test is assessing. Therefore, the developers will select the sample population that their test will be tested with in hopes of representing the general population. Most standardized tests use a normative sample that is based off of U.S. Census of what the general population of the U.S. looks like at the time of the test development. This may be based on different demographic variables such as race, geography (such as regional differences), socioeconomic backgrounds, and other areas.
19 15:27 — 16:09	When test developers construct their normative sample from the U.S. Census, or something close to it, children from cultural and linguistic varying backgrounds are generally included in the normative sample, but their representation in the sample might not be enough to reflect their specific differences. Therefore, their specific skills may not be seen as "typical" by the test developers because the number of children from that particular background is not high enough to influence the test outcomes in the normative sample. Consequently, these tests are then not valid instruments for assessing culturally or linguistically diverse children.
20 16:10 — 17:41	Here is an example of the demographic information provided for the Goldman-Fristoe Test of Articulation 3. This is an assessment tool that is commonly used to identify speech sound disorders in children. If you look toward the bottom of this information graphic, you will see that 57.1% of the population in the normative sample are white, 22.3 are Hispanic, 11.4% are African American, 2.1% are Asian, and 7.1% identified as "Other." You can also look at some of the other differences such as parent education or regional differences. If we just look at one of these areas for an example, such as race/ethnicity, we can see again that it is reported that 57.1% of the normative sample are white children and 11.4% are African American children. Consider how African American children then will not be proportionately represented in this test because the representation in the sample is much smaller than that of white children. Therefore, what ends up happening with the outcomes of these standardized assessment tools is that the cultural and linguistic behaviors of white children are the dominant skills that get represented in these samples as being typical or the norm.
21 17:42 — 20:32	Next, we can begin to talk about how this information, along with other types of bias, need to be considered when discussing concerns for misdiagnosis. First here is an overview of potential areas of bias in speech sound assessment. We've already talked about the normative sampling issues that can lead us to potential bias in our assessment process. We discussed that the representation in the sample size of children who come from different language backgrounds might be too small to represent them in the normative sample. Therefore, their skills or their language variation will often not be represented within the tool. Also, one of the other factors that we need to consider is that the language and or dialect status of the participating subjects is not often mentioned within the normative sample of the test. For example, if we reflect back on the last slide with the Goldman-Fristoe Test of Articulation, you saw that they identified children by race and ethnicity, but there was not a mention of the language differences that might be represented within this particular population. For example, are the children identified as African American speakers of African American English or another dialect? Another area of potential bias in speech sound assessment is that there are differential distributions of languages within bilingual or multilingual speakers. This means that there are many differences with bilingual children in considering speech and language development and acquisition depending on variables such as: how frequently they're exposed to each language, when they learned each of the languages that they speak, and other influences to consider. Therefore, the age they acquire specific phonemes will not always be the same as monolingual speakers of the same age. Also, bias might be present if we don't consider regional or geographic differences that may occur in specific dialects or languages that might not be proportionally represented in the normative sample. Another consideration for potential bias is the language and or dialect of the administration of the assessment tool if it does not match the language variation of the child. We also need to consider the perception of linguistic information of the examiner. And finally, we need to consider the potential for linguistic bias of the examiner. We will talk about these different variables in more depth in the following slides.

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22 20:33 — 21:47	***Dr. Amy Hobek Ph.D. CCC-SLP (cont.):*** So now we're going to talk about concerns for misdiagnosis as we look more in depth at two specific areas that might lead to potential bias. We consider the potential bias that was mentioned in the previous slide, we can take these factors and categorize them into these two different areas of bias when administering standardized tests. The first area identified is linguistic bias. This type of bias is present when the measures that are used to assess speech and language processes do not adjust the scoring for language variations. This form of bias focuses on the test constraints of the assessment process. Next, we also have situational bias. This occurs when the cultural communication style and expectations of the person being tested and that of the examiner do not match. This form of bias focuses on the examiner constraints of the assessment process. We will discuss each of these in more detail in the following slides.
23 21:48 — 24:02	Let's look at some ways that linguistic bias can be present in speech sound assessment. First, speakers of dialects and languages that are different from Mainstream American English can have speech sound disorders within their language system. Therefore, we can't just look at difference versus disorder. Instead, we really need to be sure that this tool can assess a child with a speech sound disorder even if they have a language difference in the form of dialect or language variation. Next, another concern for misdiagnosis is that with the standardized assessment tools clinicians often use, there's not much guidance within the examiner's manual on how to administer or adapt them with children who have language variations. Another factor for consideration is that there are phonemic inventories that vary across languages. For example, Spanish has phonemes that are not present in the English language, and English has phonemes that are not present in the Spanish language. The tool does not take that into consideration; it can lead to misdiagnosis. There are also developmental sequences that vary across languages and dialects. For example, a specific phoneme, or phonological process, might develop around the age of three for Mainstream American English speakers. However, the same phoneme or phonological processes may develop earlier or later in a different language system. And finally, because of the availability of tests, many speech-language pathologist asses all American English dialect speakers and multilingual children using Mainstream American English-only tests. Most clinicians do not have access to a wide variety of tests within their clinical environments. And there also are not a lot of other tests published that assess in different dialects or languages for speech sound assessment. Sometimes the only tools available are tests in Mainstream American English.
24 24:03 — 25:49	Now let's look at some ways in which situational bias can be present in speech sound assessment. First, speech sound disorder tests are scored based on clinician impressions made by the examiner. The examiner listens to the production by the client, interprets the phonemic production, and then documents the perceived production on a record form. The speech-language pathologist may perceive and document productions of speech sounds based on their own biases and beliefs of race and ethnicity. For example, if a clinician has certain implicit linguistic prejudice of non-mainstream dialectical differences as inferior to Mainstream American English forms, they may document productions of speech sounds as errors without making any accommodations for language difference. If this unconscious bias is present, even in only a small number of small test items, it could still change the results of the test score and identify a child with a language disorder even if they do not have one. Additionally, speech-language pathologists may have difficulty perceiving or identifying phonemic characteristics of another language system when it is not a language that they speak. For example, we learn in speech and language development that at a young age, a child's linguistic system becomes more restricted to the specific phonemes of their own language system and cannot perceive phonemes that are present in languages that they have not been exposed to.

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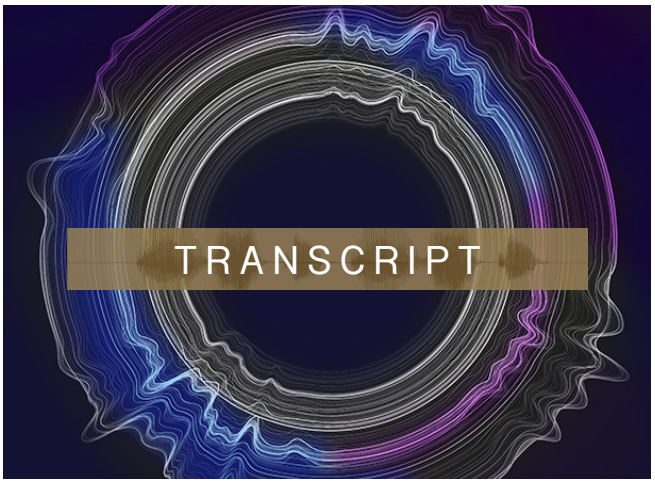

TIME (MM:SS)	TRANSCRIPT PAGE 6/6
25 25:50 — 28:30	***Dr. Amy Hobek Ph.D. CCC-SLP (cont.):*** On this slide, I want to illustrate some examples of potential bias that could occur if we are looking at a specific linguistic system that is different from Mainstream American English. Here we have some examples of how linguistic bias, or situational bias, may occur based on the specifics of a particular language a child may speak. I chose Arabic randomly from the ASHA website phonemic inventories and cultural and linguistic information across languages, which looks at different languages and their different linguistic characteristics. So, when we look at this chart regarding the Arabic linguistic system, specifically a dialect of Arabic used in the country of Jordan, we can see how linguistic bias could be present in a speech sound assessment of a monolingual or bilingual speaker of Arabic. Linguistic bias can be present on a test if adaptations for these types of phonemic variations are not mentioned within the test format themselves. For example, you can see that there are some phonemes in Arabic that are not found in English. Those phonemes would not be examined for correct productions or errors on a test that was developed in English, which could contribute to a misdiagnosis if the child had errors more predominantly within those phonemes. More specifically, they would not be diagnosed with a speech sound disorder when they may indeed have one. Additionally, situational bias can occur if the clinician perceptually misidentifies those phonemes produced in Arabic that do not occur in English as a speech sound error or an English phoneme. And then you can also see here that this document list phonemes in English that are not found in Arabic. When considering linguistic bias, if a test in English expects production of these phonemes that are not found in Arabic, the child's productions would be counted as errors which could lead to misdiagnosis of a speech sound disorder when there is really only a linguistic difference present. Situational bias from the examiner constraints could also be present if the examiner does not have knowledge of the Arabic language phonemic differences to be able to make adaptations on the test to the child's language differences.
26 28:31 — 30:35	So how do we, as future clinicians, avoid speech-sound assessment bias? First, it's important to understand that everyone speaks a dialect, and everyone has an accent. This is important so that we can avoid implicit bias about certain dialects and accents being "normal," "typical," or "standard" in any way. We need to understand what languages and dialects the specific child we are evaluating hears and uses so that we understand how often and in which context they are using each language variation and what development might look like for that child based on that information. We also need to obtain speech-sound information regarding the child's language. Just like what we looked at in the previous slide, about the phonemes that may or may not be present in that language system compared to what the test might be assessing in English. We should conduct a speech-sound assessment evaluation in all languages when possible so that we can assess the child while taking into consideration all of their linguistic resources. It will benefit us to collaborate with interpreters as well as linguistic brokers who understand the language system that the child speaks so they can help us understand the client's language system from the specific country and/or dialect that the child speaks, and what specific phonemes are used and produced in that language system that might contrast with English expectations. Finally, another area that is very important and critical to a least biased testing format to a child, is to identify which speech sound productions are due to a child's language history and which are true speech-sound errors so that we can most accurately diagnose a speech sound disorder.
27 30:36 — 30:44	Here are some important references that contributed to our content in this presentation.
28 30:45 — 30:58	Thank you and we hope that you learned important information about language variation, speech-sound assessment, and concerns for misdiagnosis.