CULTURALLY INCLUSIVE EDUCATION FOR THE **SPEECH SCIENCES**

ASSESSMENT BIAS IN SPEECH SOUND DISORDERS

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OUTLINE

SPEECH SOUND DIFFERENCES
- Speech sound difference in dialects of American English
- Speech sound differences in different languages

STANDARDIZED ASSESSMENTS
- Why do we use them?
- How do we use them?

BIAS IN SPEECH SOUND ASSESSMENTS
- Normative sampling
- Concerns for misdiagnosis

(Connect2Care, 2022)

PREREQUISITE KNOWLEDGE

LEARNING OBJECTIVES

FUNDING

N/A

- Define dialects and bilingualism
- Phonological systems for languages/dialects

- Understand rule-governed features of languages/dialects
- Identify potential biases of standardized assessments
- Identify concerns for misdiagnosis in culturally and linguistically diverse populations

Speech Sound Differences
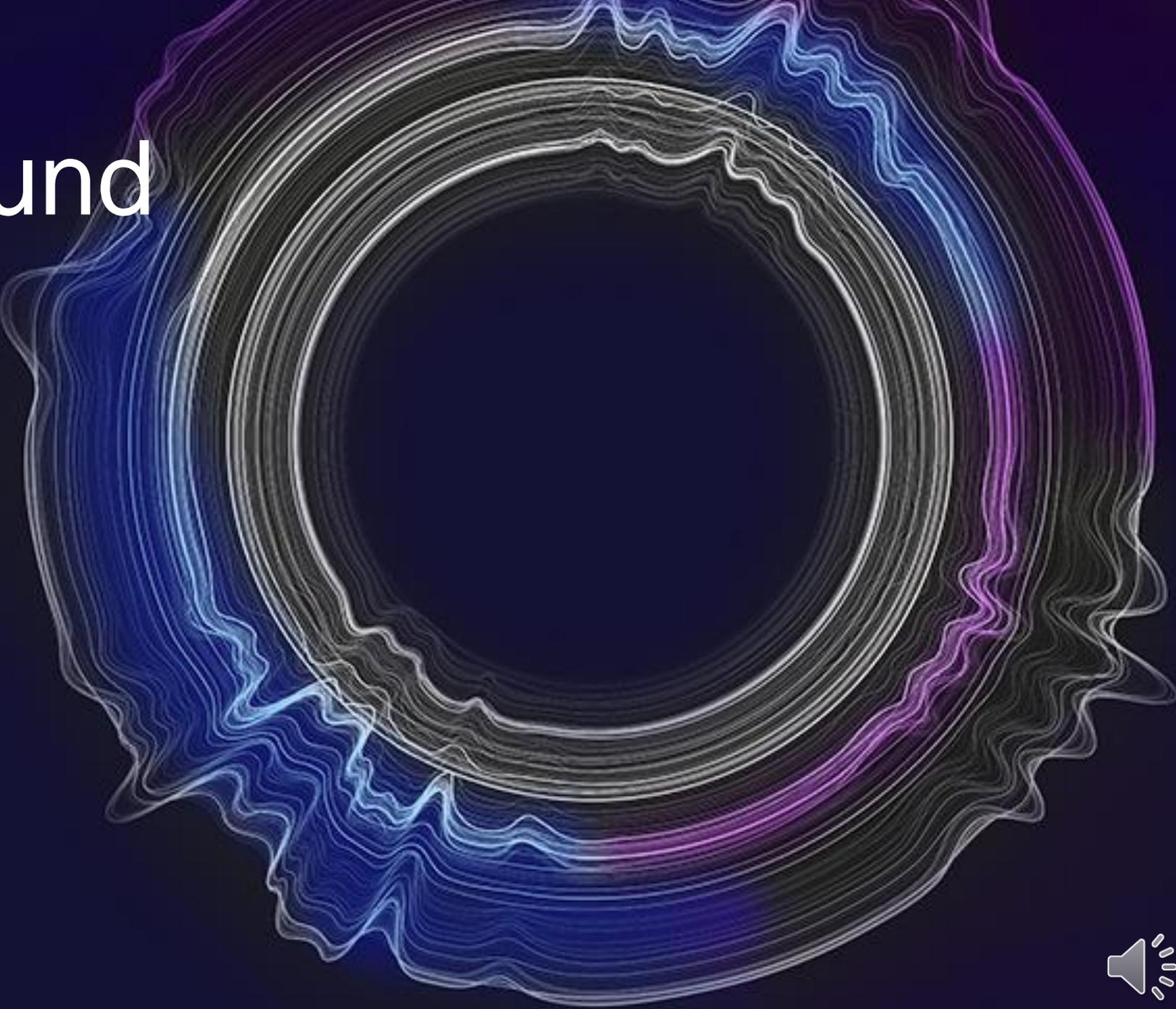
Dialects

"Languages are invariably manifested through their dialects, and **to speak a language is to speak some dialect of that language**…. the term dialect is defined as a neutral label to refer to any variety of a language which is shared by a group of speakers"

(Wolfram, 1991)

Speech sound difference in dialects of American English

- What are dialects?
- Dialects examples:

General American English ("mainstream" dialect), African American [Vernacular] English (AAVE), Chicano English, Appalachian English

Speech sound difference in dialects of American English

- Examples of dialectal features
  - AAVE features (Thomas, 2007):
    - Third-person singular -s absence (He think he <u>look</u> cool)" (p.450)
    - Non-rhoticity ([foə], [fo:], [fou] for "four") (p. 453)
    - Metathesis ([æks] for "ask") (p.452)
  - Midwestern (Smit et al., 1990)
    - /ʒ/ not frequently used (p. 55)
- Assumptions
- Codeswitching

(U.S. Census Bureau, n.d.)

Bilingualism

"Children who are multilingual are able to **comprehend and/or produce two or more languages** in oral, manual, or written form with at least a basic level of functional proficiency or use, regardless of the age at which the languages were learned"

(International Expert Panel on Multilingual Children's Speech, 2012, p. 1, adapted from Grech & McLeod, 2012, p. 121).

Speech sound differences in bilingual development

- Bilingualism can vary
  - Individual variability
  - e.g., simultaneous or sequential exposure

- Crosslinguistic effects/transfer
  - Phonological systems interaction
  - Codeswitching

- Patterns of speech may differ from monolingual children (McLeod et al., 2017)
  - Differences in phoneme mastery may vary by language

- Features may resemble features of speech sound disorders (SSDs)
  - Reduced intelligibility to the listener

Spanish & English Phonemes

SPANISH /ɲ/ /ɾ/ /r/ /x/

/b/ /d/ /g/ /p/ /t/ /k/ /m/ /n/ /s/ /tʃ/ /j/ /l/ /f/

ENGLISH /ð/ /dʒ/ /h/ /ŋ/ /θ/ /ɹ/ /ʃ/ /v/ /w/ /z/ /ʒ/
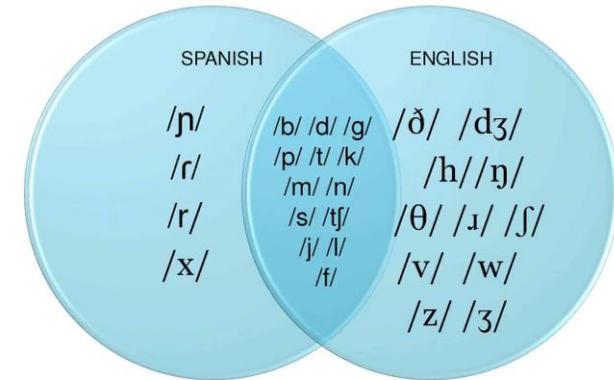
BILINGUISTICS

Cantonese Vowel Phonemes

CANTONESE /œ/ /ɵ/ /ə/ /y/

/i/ /ɪ/ /ɛ/ /a/ /u/ /ʊ/ /ɔ/

ENGLISH /e/ /æ/ /o/ /ʌ/ /ə/ /ɑ/

BILINGUISTICS

(Bilinguistics, 2021, Prath, 2022)
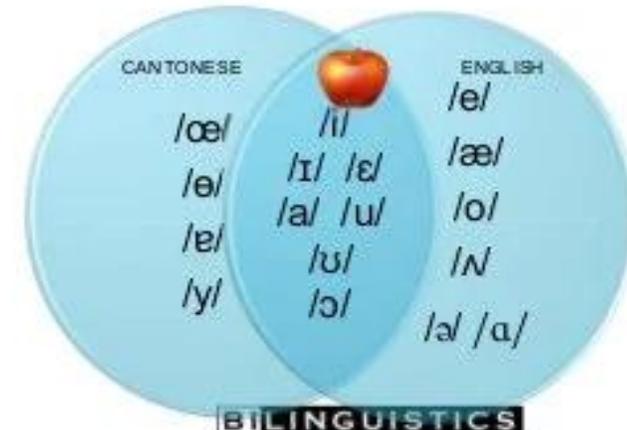
How do you think these speech sound differences could impact a CALD speaker during speech assessment?

Standardized Assessment
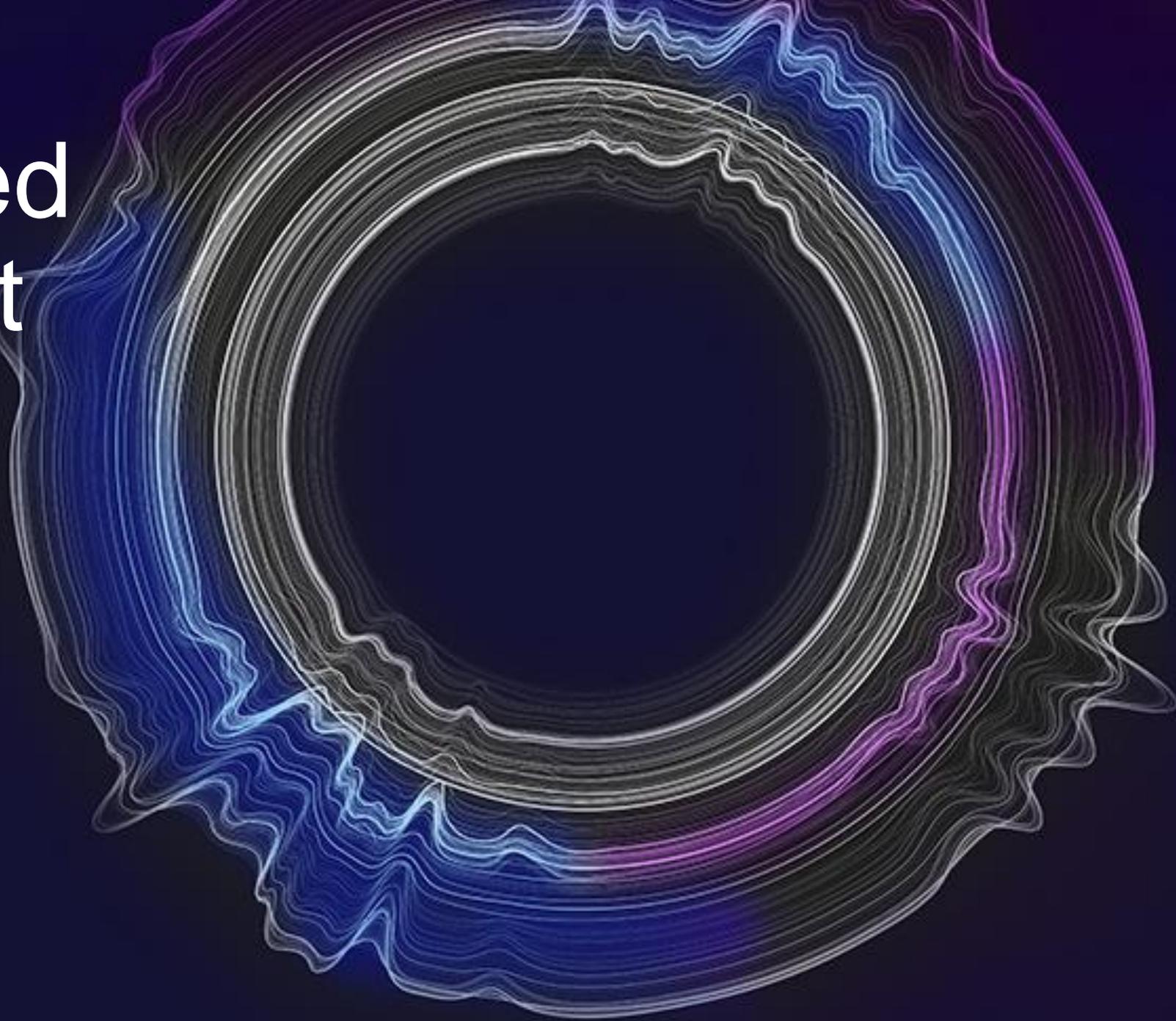
Speech sound assessment: Why?

- SSDs can have lifelong effects

- Determine intervention needs

- Identify if speech features are indicative of SSDs or communication differences

Speech sound assessment: How?

- Norm-referenced, standardized assessments
  - Single-word
- Intelligibility measures
- Stimulability
- Oral motor exam

(Gildersleeve-Neumann & Goldstein, 2012; GFTA-3, n.d.; Fabiano-Smith, 2019; McLeod et al., 2017; Skahan et al., 2007)

Culturally Responsive Assessments

- Diagnostic Evaluation of Articulation and Phonology (DEAP; Dodd et al., 2006) subtest for articulation for speech sounds in children

Original Protocol

Culturally Adapted Protocol: Bilingual Jamaican Creole and English speakers

- Pig → /pɪg/

- Watch → /wɑtʃ/

→

- Pig → /pɪg/, /pig/, /pɪgɪ/, /pigi/

- Watch → /wɑtʃ/, /watʃ/

(Dodd et al., 2006; Washington et al., 2017)

Measuring Acoustic Differences: Vowel Duration

**/pig/**

280 ms

/pi:g/

400 ms
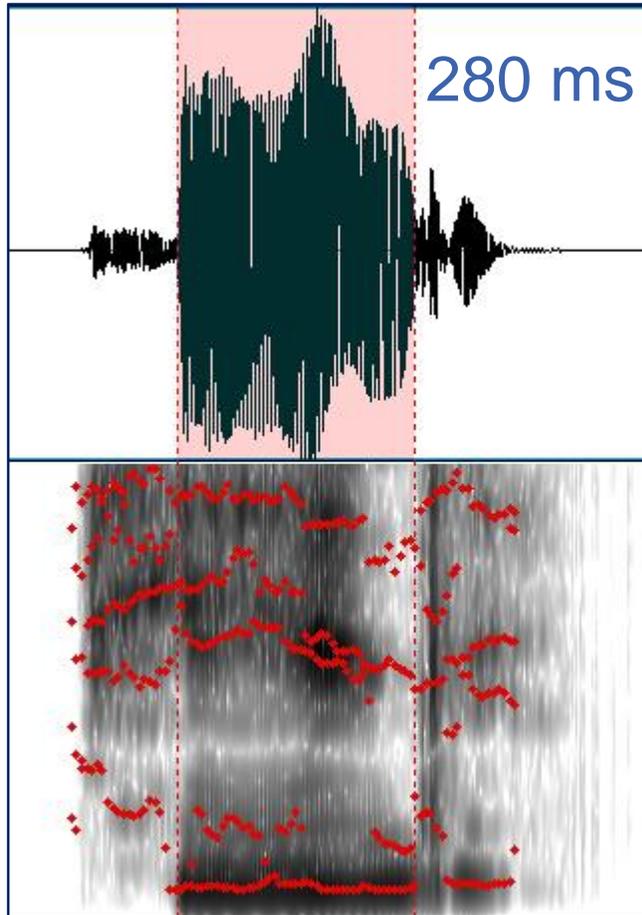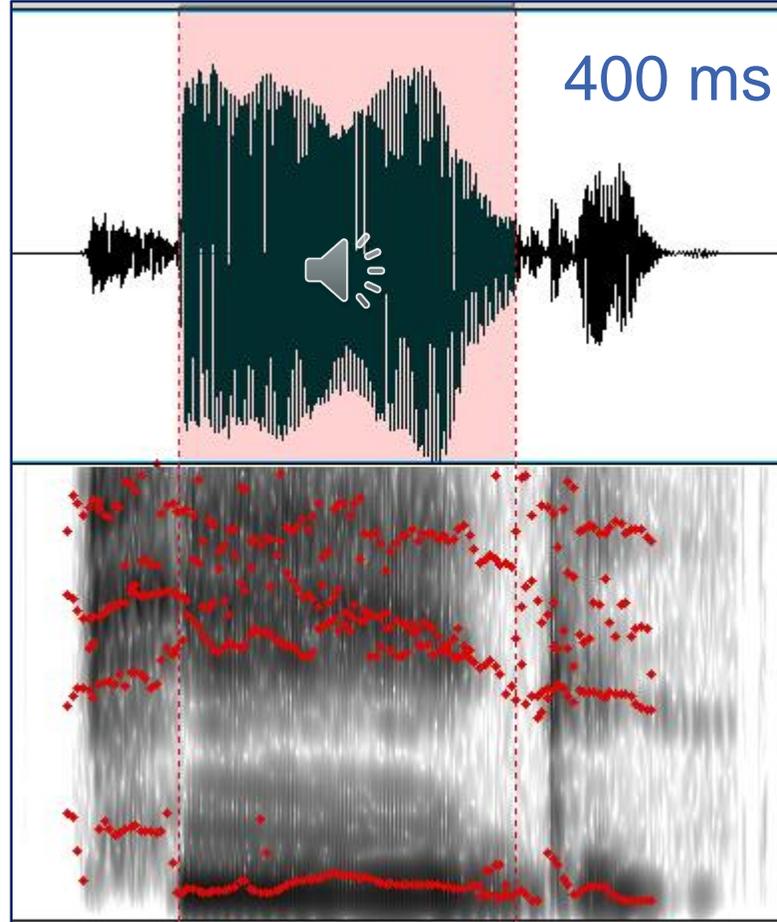
- Acoustic measures and analyses can also contribute to the contemporary understanding of articulatory/acoustic patterns in bilingual children

- Accurate representation of bilingual children's speech abilities and has the potential to reduce their risk for misdiagnosis of communication disorders

(León, et al. 2022)

Bias in Speech Sound Assessment

Normative sampling
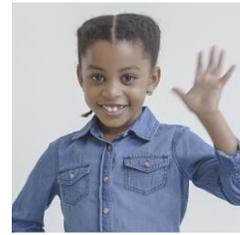
- To determine what is "typical" for the general population, a test will use a <u>normative sample</u>.

- Most standardized tests use a sample that is based off the 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 race, geography, socioeconomic backgrounds, etc.

(Leaders Project, 2013)

Normative sampling

- Children from cultural and linguistic varying backgrounds might be included in the normative sample, but their representation (by percentage) in the sample might not be high enough for the tool to reflect their differences.

- Therefore, their specific skills may not be seen as "typical" by the test developers.

- These test are then not valid instruments for assessing culturally or linguistically diverse children.

(Leaders Project, 2013)

(Pearson Education, Inc., 2019)

Concerns for misdiagnosis

Potential bias in speech sound assessment:

- Normative sampling issues
    - Representation in sample too small
    - Language-dialect status of participating subjects often not mentioned
- Differential distribution of language systems in bilinguals
- Regional/Geographical differences in dialects and languages
- Language/dialect of administration
- Perception of examiner
- Linguistic bias of examiner

(Hyter & Solas-Provance, 2019)

Concerns for Misdiagnosis

- <u>Linguistic Bias</u>: when measures are used that assess speech and language processes do not adjust the scoring for language variations (test constraints).

- <u>Situational Bias</u>: when the cultural communication style and expectations of the person being tested and that of the examiner do not match (examiner constraints).

(Hyter & Solas-Provance, 2019)

Concerns for Misdiagnosis

- <u>Linguistic Bias</u>
  - Speakers of dialects and languages that vary from Mainstream American English may have speech disorders within their language differences.
  - Less guidance in tools for children with language variation(s).
  - Phonemic inventories vary across languages.
  - Developmental sequences vary across languages.
  - Because of availability of tests, many SLPs assess all American English dialect speakers and multilingual children using Mainstream American English-only tests.

(Jasso & Potraz, 2020; Neel, 2021)

Concerns for Misdiagnosis

Situational Bias

- Speech sounds disorder tests are scored based on clinical impressions made by the examiner.

- SLPs may perceive and document productions of speech sounds based on their bias and beliefs of race and ethnicity.

- If unconscious bias is present in only a small number of test items, it could change the results of the test score.

- SLPs may have difficulty perceiving or identifying phonemic characteristics of another language system.

(Evans et al., 2018; Neel, 2021)

Examples of Potential Bias

Linguistic Bias:
Phonemes present in other languages not represented

Situational Bias:
Clinicians may not correctly perceive phonemes that are not present in their own linguistic system

Facts on Arabic Phonology*

- There are three "levels" of Arabic:[1]
  - Modern Standard Arabic—used in religious ceremony and literature,
  - Educated Spoken Arabic—used in schools and public arenas, and
  - Colloquial Arabic—used at home and in community; significant dialectal variability exists among colloquial forms.
- Dialectal variations in phonology are evident in Arabic. It is important to recognize this when assessing an Arabic speaker.
- Arabic has emphatic consonants, such as /t/, /d/, /ð/, and /s/. Emphatic consonants are described as those sounds that are produced with the root of the tongue retracted toward the pharyngeal wall.[2]
- In postvocalic environments the /r/ is trilled; however, in prevocalic environments the /r/ is tapped.[3]
- Phonemes in Arabic that are not found in English include the following:
  - /t/, /d/, /ð/, /s/, /χ/, /ʁ/, /ħ/, /ʕ/, and /ʔ/.[4]
- Phonemes in English that are not found in Arabic include the following:
  - /p/, /v/, /ɹ/, /ʒ/, /g/, and /ŋ/.
- Research indicates that for Arabic-speaking children in Jordan, medial consonants have a higher incidence of accuracy than initial or final consonants.[5]

*Information based on a dialect of Arabic used in Jordan.

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[2] Amayreh, M., & Dyson, A. (1998). The acquisition of Arabic Consonants. *Journal of Speech, Language, and Hearing Research, 41*, 642–653.
[3] *Ibid.*
[4] *Ibid.*
[5] *Ibid.*

(American Speech-Language and Hearing Association, n.d.)

Avoiding Test Bias

- Clinicians must:
  - Understand that everyone speaks a dialect and everyone has an accent
  - Understand the children's language/dialect use and experience
  - Obtain speech sound information in the child's language(s)
  - Conduct a speech evaluation in all languages when possible
  - Collaborate with interpreters or linguistic brokers
  - Identify which speech sound productions are due to child's language history and which are true errors

(Jasso & Potraz, 2020)

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