



Adapting the Established American
English speech audiometry materials for
clinical use in Singapore

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Introduction

Aim:

To adapt the established American English speech audiometry materials for clinical use in Singapore.

The American English speech audiometry materials used in this study:

	Type of speech audiometry material used	Name of word list used	
1	Spondees	Central Institute of the Deaf (CID) W-1	} Singapore Version American version
2	Monosyllabic words	CID W-22	
3	Sentences	Bamford-Kowal-Bench (BKB) sentences	

Background

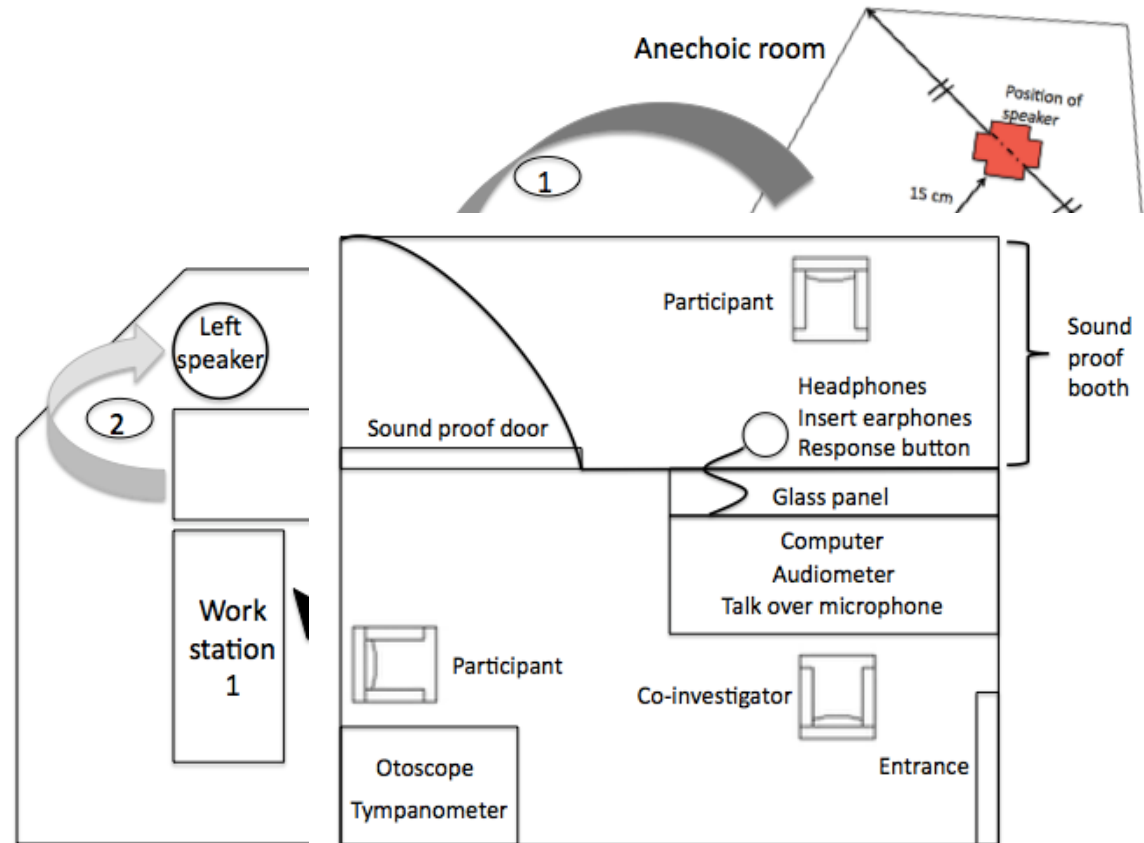
Research has shown that language background impacts on the performance of the listener (Axmear et al., 2005; Major et al., 2002; Matsuura et al., 2014).

Speech audiometry related research -Development of the Mandarin Monosyllable Recognition test (Tsai et al., 2009) to be used with Mandarin speakers in Taiwan.

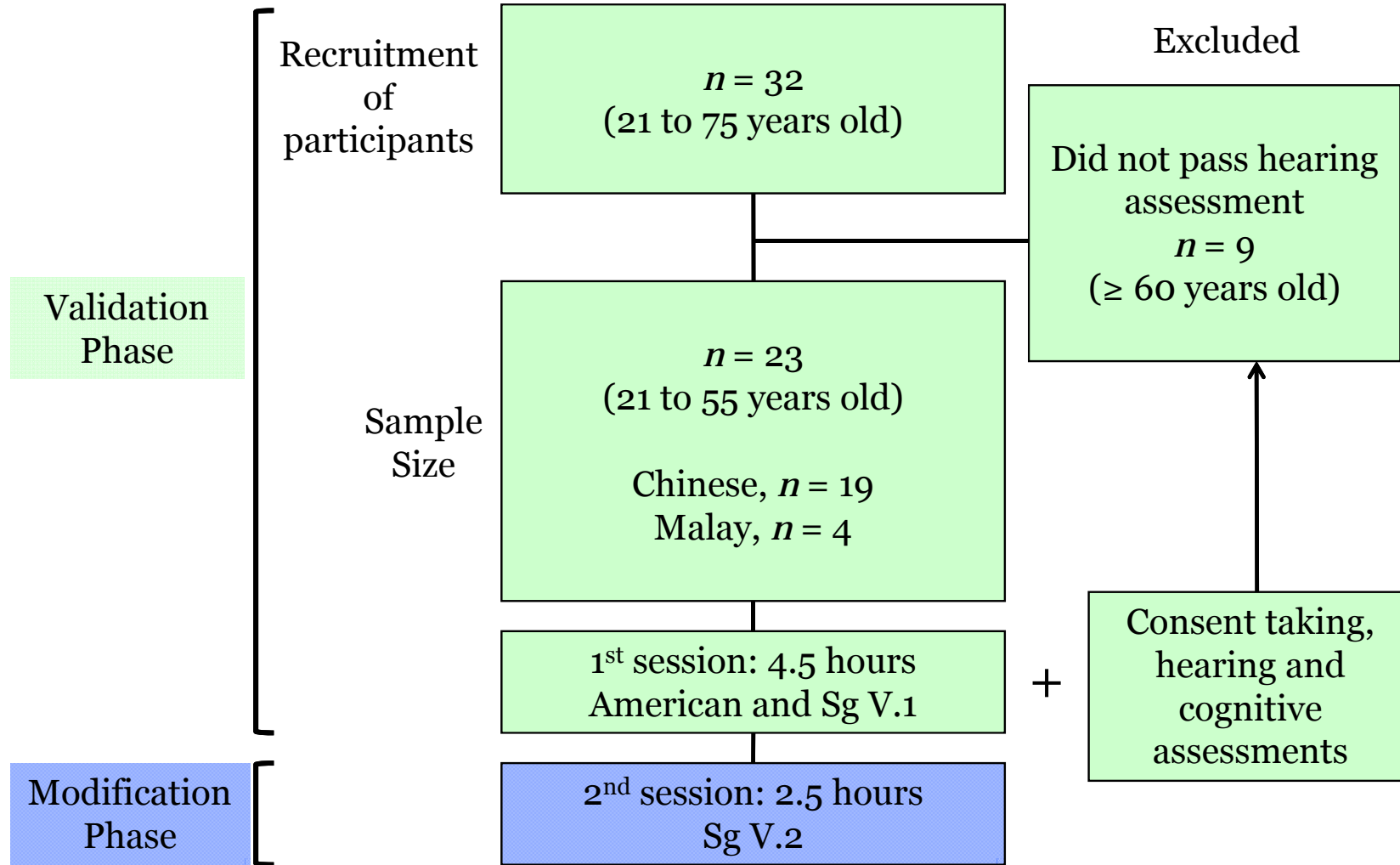
Methodology

Recording Phase

- Speakers selection
- Instrumentation for recording
- Speech audiometry materials:
 - Monosyllabic words
 - Spondees
 - Sentences
- Processing of recordings (editing and exportation)



Participant flow chart



Results

Significant results:

1. Higher scores yielded for Spondees Track 3 List A Sg V.1 than American version
2. Higher scores yielded for Sg V.1 monosyllabic word lists than American version exception of three lists
3. Higher scores yielded for only List 4 of BKB sentences Sg V.1 than American version

Results cont.

Speech audiometry materials	Individual words (intra-list) which yielded more than 20% errors					Material version
Spondees	duckpond					American version
Monosyllabic words	wool	dull	clothes	knee	on	
	send	ham	odd	owl		
Sentences	hole	bull				
Spondees	duckpond					Sg V.1
Monosyllabic words	bin	stove	knee	there	chest	
	low	him	toe	bathe	show	
	up	ham	aim	our		
Sentences	faucets					
Monosyllabic words	bill	us	chew			Sg V.2

Discussion

Track 3 

Track 2 

Postulations:

1. Inconsistence of speaker during recording
2. Longer inter-stimuli intervals of 1 second for Track 3 List B

Postulation: Effect of American's speaker accent on local Singaporean listeners (Major et al. 2002; Matsuura et al. 2014)

Errors < 20%
(American)

Discussion cont.

Postulations:

1. Effect of listener's phonological processing abilities (Deterding & Poedjosoedarmo 1998)
2. Poor recording and/or editing

Errors
< 20%
(Sg V.1 only)

Errors
< 20%
(Sg V.2 only)

Postulations:

1. Speaker's pronunciations unclear for these words
2. General Singapore accent and pronunciation unclear for these words

Discussion cont.

Presence of contextual cues allowing listener to conceptualise and extrapolate possible key words used in conjunction with acoustic cues (Hirsh et al. 1952; Wilson, McArdle and Smith 2007)

No significant differences between American and Sg V.1 versions of BKB sentences (except of 1 list)

Further directions:

1. Tabulating list of acceptable range of allowed pronunciations
2. Increase accuracy of capturing speech scores by implementing inter-rater and intra-rater reliability measures
3. Establishing large-scale normative data collection on Singapore population



Conclusion

- 👍 In this study, majority of the speech scores for Singapore version of speech audiometry materials
- 👍 yielded were higher than the American version
- 👍 indicating high usability on Singapore population.

Next in mind: The Singapore speech audiometry materials produced in this study administered on the local population with large-scale normative data collection.

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Thank you 😊