



Certificate of Appreciation

The certificate is presented to:

Wan Aslynn Salwani Wan Ahmad

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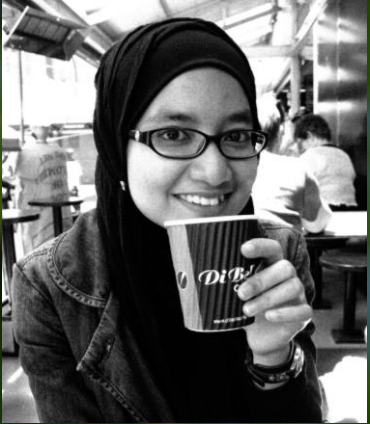
10-11 August 2022 • KLCC Convention Center, Kuala Lumpur, Malaysia.

Prof. Dr. Shameem Rafik-Galea

MAAL APC 2022 Conference Chair

President, Malaysian Association of Applied Linguistics (MAAL)

DEVELOPING A SPOKEN MALAY CORPUS FOR PAEDIATRIC MALAY MATRIX SENTENCE TEST (PaedMalayMST) MATERIAL



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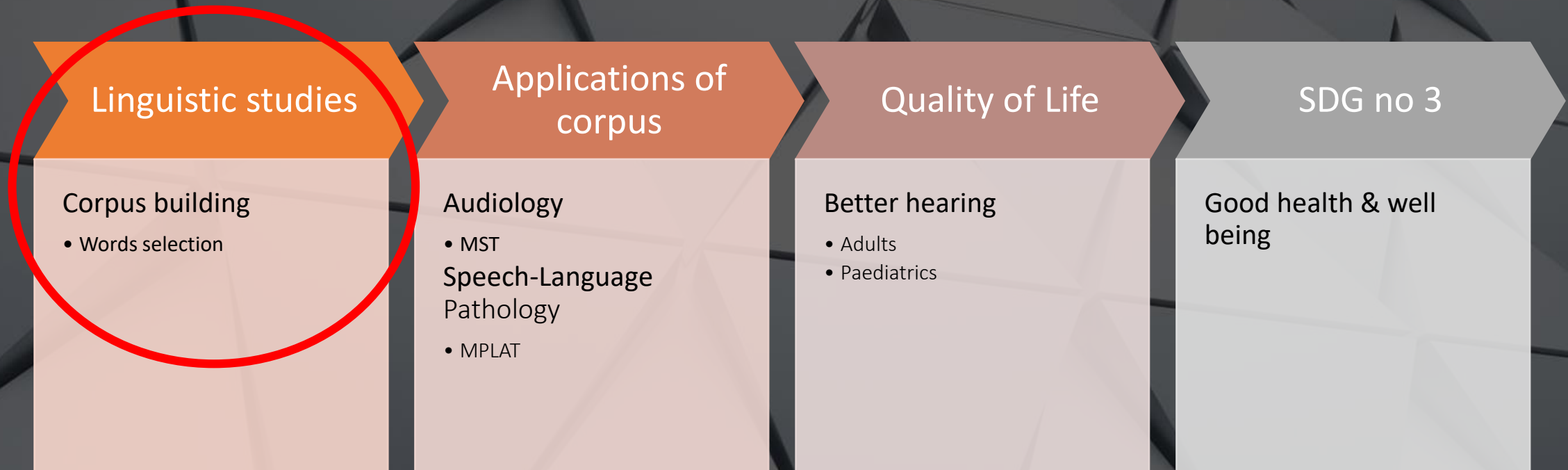
Department of Audiology & Speech-Language Pathology
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International Islamic University Malaysia

Overview

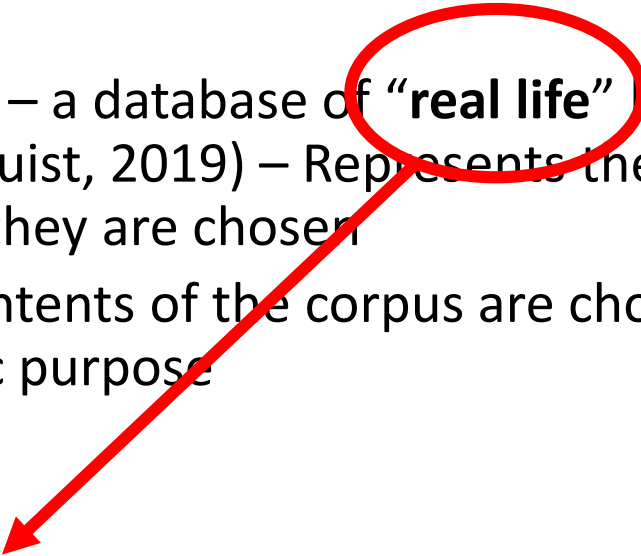
- The big picture
- A corpus
- Matrix sentence test
- Objectives of the study
- Methodology
- Results
- Discussion
- Conclusion

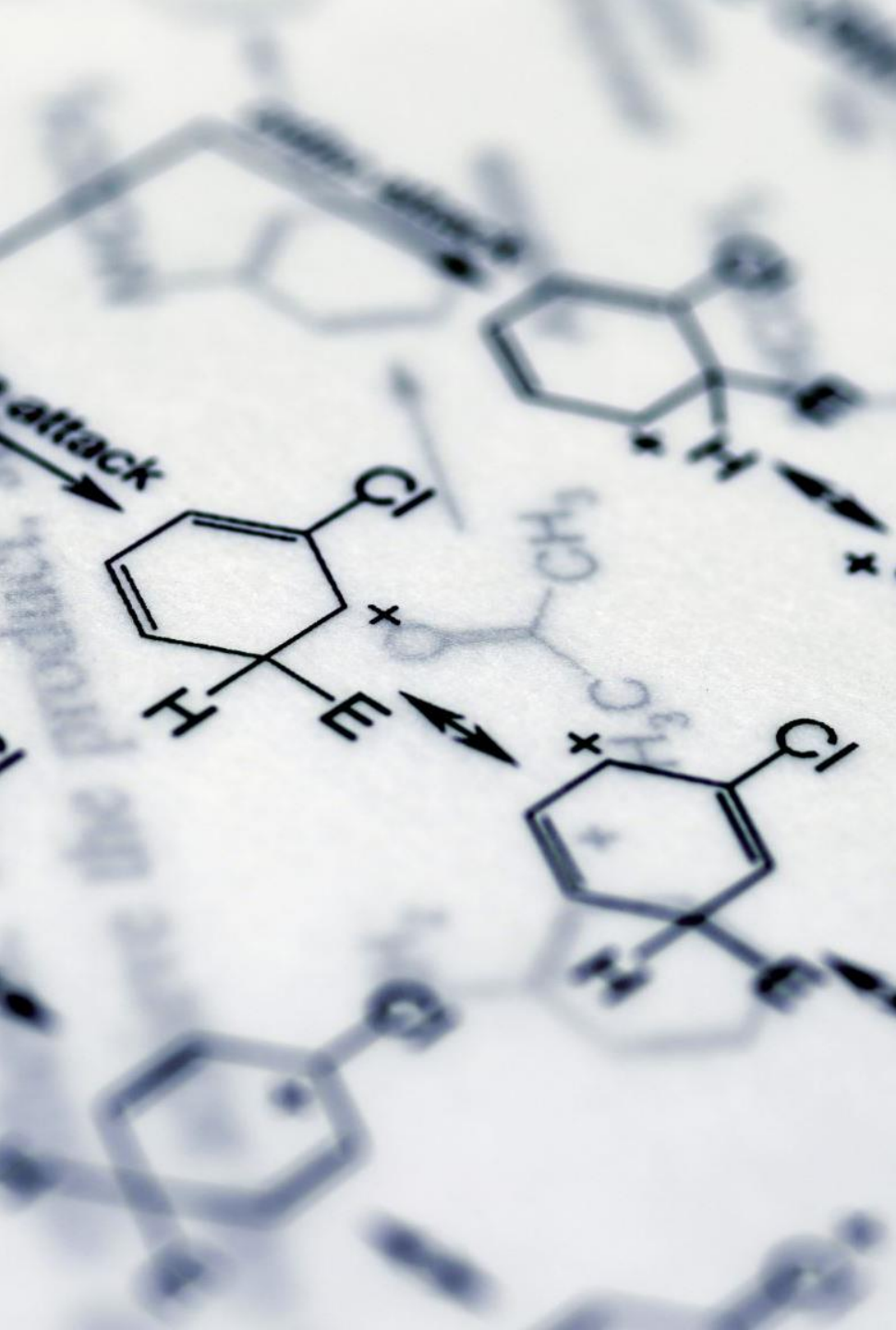


The BIG picture



What is a corpus?

- Definition:
 - Corpus – a database of “**real life**” language (Nordquist, 2019) – Represents the language from which they are chosen
 - The contents of the corpus are chosen to support a specific purpose
 - Written
 - Spoken
 - Genre
 - Varieties of the language
- 



Examples of corpora

DGD - Willkommen

The DGD is the Database for Spoken German (Datenbank für Gesprochenes Deutsch). To use the DGD, you need to register. You find the DGD's user interface in German. We are sorry we cannot provide a localized interface for other languages. This page provides some basic information on the DGD in English.

Corpora

The DGD gives registered users access to 34 corpora of spoken language from the Archive for Spoken German (Archiv für Gesprochenes Deutsch - AGD). The corpora consist of:

- The Research and Teaching Corpus of Spoken German ("Forschungs- und Lehrkorpus Gesprochenes Deutsch", FOLK), a state-of-the-art corpus of spontaneous interaction.
- The spoken German ("Gesprochene Wissenschaftssprache-Konferenz") of academic speech.
- Further interaction corpora, such as the Freiburg Corpus (FC) and the spoken interaction corpus (SIC).
- The large "historic" spoken corpora of German, most importantly the corpus German speech of Deutsche Rundfunk ("Deutscher Rundfunk", DR) and its "satellite corpora" German dialects in Eastern Europe (DGE), German dialects in the Black Forest region (BVG), German dialects in south-west Germany (SWG), German dialects in the GDR (GGD).
- Other influential spoken corpora for German, such as the oral Basic German ("Deutsche Umgangssprache", "Dialekt-Korpus", DK) and the European Standard German ("European Standard German", "Europäisches Standarddeutsch", "ESD") as well as the oral standard German ("Standard German", "SG").
- Corpora on editorialial varieties of German ("Journalistisches Deutsch", "JDD") such as Michael Clynch's corpus on Australian German, a corpus on German in Nigeria and a corpus on Indonesian ("Indonesian German", "IG").
- Anna Baker's corpus on the German of Emigrants to Israel ("Immigrantendeutsch in Israel", "II", BNC, ISZ).
- Robert Dittus' corpus on German identification ("Identifizierendes Deutsch", "ID").

Together, the DGD contains more than 4000 hours of audio and video recordings and more than 17 million handwritten tokens. With a few exceptions, all handwritings in the database are time aligned with the recordings and associated with context and post-of-speech information.

Functionality

<https://dgd.ids-mannheim.de/DGD2Web/jsp/Welcome.jsp>

BRITISH NATIONAL CORPUS

About

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Using the BNC

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Search the British National Corpus online

Various online services offer the possibility to search and explore the BNC with different interfaces. Some of the most notable are listed below:

- Audio BNC - access the digital audio files from the spoken corpus
- BNCWeb at Lancaster University (registration required - sign up here)
- BNC (Birmingham Young University)
- IntelliText (University of Leeds)
- Phrases in English

Please note that we cannot answer queries about using any of these services, which are provided by other institutions. If you have a service for querying the BNC online, get in touch and we'll consider adding it to the list.

About the BNC

The British National Corpus (BNC) is a 100 million word collection of samples of written and spoken language from a wide range of sources, designed to represent a wide cross-section of British English, both spoken and written, from the late twentieth century. [more]

Here are some of the most popular links to information about the BNC:

- Download the full BNC (XML edition) from the Oxford Text Archive
- Download the BNC Baby (4m word sample) from the Oxford Text Archive
- Reference Guide for the BNC (XML edition)
- BNC User License
- Citation and references

More from the BNC

<http://www.natcorp.ox.ac.uk>

Corpus of Contemporary American English

SEARCH REGISTER CONTEXT OVERVIEW

List Chart Word Browse +

straight [POS]?

Find matching strings Reset

Sections Texts/Virtual Sort/Limit Options

(HIDE HELP)

Download the corpus (and corpus-based frequency data) for offline use

PDF overview Five minute tour

The Corpus of Contemporary American English (COCA) is the only large and "representative" corpus of American English. COCA is probably the most widely-used corpus of English, and it is related to many other corpora of English that we have created. These corpora were formerly known as the "BYU Corpora", and they offer unparalleled insight into variation in English.

The corpus contains more than one billion words of text (25+ million words each year 1990-2019) from eight genres: spoken, fiction, popular magazines, newspapers, academic texts, and (with the update in March 2020): TV and Movies subtitles, blogs, and other web pages.

Click on any of the links in the search form to the left for context-sensitive help, and to see the range of queries that the corpus offers.

There are six main ways to search the corpus:

First, you can search for phrases and strings. And because the corpus is

<https://www.english-corpora.org/coca/>

Overview of The Corpus of Contemporary American English(COCA)

Genre	# texts	# words	Explanation
Spoken	44,803	127,396,932	Transcripts of unscripted conversation from more than 150 different TV and radio programs (examples: All Things Considered (NPR), Newshour (PBS), Good Morning America (ABC), Oprah)
Fiction	25,992	119,505,305	Short stories and plays from literary magazines, children's magazines, popular magazines, first chapters of first edition books 1990-present, and fan fiction.
Magazines	86,292	127,352,030	Nearly 100 different magazines, with a good mix between specific domains like news, health, home and gardening, women, financial, religion, sports, etc.
Newspapers	90,243	122,958,016	Newspapers from across the US, including: USA Today, New York Times, Atlanta Journal Constitution, San Francisco Chronicle, etc. Good mix between different sections of the newspaper, such as local news, opinion, sports, financial, etc.
Academic	26,137	120,988,361	More than 200 different peer-reviewed journals. These cover the full range of academic disciplines, with a good balance among education, social sciences, history, humanities, law, medicine, philosophy/religion, science/technology, and business
Web (Genl)	88,989	129,899,427	Classified into the web genres of academic, argument, fiction, info, instruction, legal, news, personal, promotion, review web pages (by Serge Sharoff). Taken from the US portion of the GloWbE corpus.
Web (Blog)	98,748	125,496,216	Texts that were classified by Google as being blogs. Further classified into the web genres of academic, argument, fiction, info, instruction, legal, news, personal, promotion, review web pages. Taken from the US portion of the GloWbE corpus.
TV/Movies	23,975	129,293,467	Subtitles from OpenSubtitles.org, and later the TV and Movies corpora. Studies have shown that the language from these shows and movies is even more colloquial / core than the data in actual "spoken corpora".
	485,179	1,002,889,754	

What about Malay?

- Accessible public corpora for Malay – Korpus DBP & MyBaca however the words in these corpora are collections from written texts ONLY
- To date, there is **no** known **spoken corpus** for Malay

#	Word	Source	W. Freq...	W. Len...	# Phone...	# Syllab...	Types of Inflection	Word categorie...	Syllable structures
1	a	MIX	119	-	-	-	-	-	-
2	abang	MIX	30	5	4	2	root words	nouns	V+CVCC
3	abang_lpar	SJKM2	2	9	-	-	compound words	nouns	-
4	abangnya	MIX	2	8	6	3	root word + suffix	nouns	V+CVCC+CCV
5	abjad	SKM2	8	5	5	2	-	nouns	VC+CVC
6	abjad-abjad	SKM2	1	10	-	-	root word duplication	nouns	-
7	acara	MIX	31	5	5	3	root words	nouns	V+CV+CV
8	ada	MIX	116	3	3	2	root words	predicates	V+CV
9	adakah	MIX	12	6	6	3	root word + suffix	function words	V+CV+CVC
10	adakan	MIX	10	6	6	3	root word + suffix	function words	V+CV+CVC
11	adalah	MIX	11	6	6	3	root word + suffix	function words	V+CV+CVC
12	adanya	SKM1	1	6	5	3	root word + suffix	predicates	V+CV+CCV
14	adat_resam	MIX	2	9	-	-	compound words	nouns	-
15	adik	MIX	6	4	4	2	root words	nouns	V+CV
16	adik-beradik	MIX	17	11	-	-	duplicate words (rp...	nouns	-
17	adikku	SJKM2	1	6	6	3	root word + suffix	nouns	V+CVCC+CV
18	adiknya	SJKM2	6	7	6	3	root word + suffix	nouns	V+CVCC+CCV
19	adinda	SJKM2	1	6	6	3	root words	nouns	V+CVCC+CV
20	adindaku	SJKM2	1	8	8	4	root word + suffix	nouns	V+CVCC+CV+CV
22	aduan	SKM2	1	5	5	3	root word + suffix	nouns	V+CV+VC

<http://www.mybaca.org>

Korpus DBP - Penyelidik
Dewan Bahasa dan Pustaka

Carian Konkordans Carian Konkordans (Lama) Analisis Kata Statistik Bahan Senarai Bahan Muatnaik Bahan Panduan Log Keluar

Carian Konkordans

Kata: Cari

Sumber Bahan Tarikh/Tahun Terbit Bahan Kriteria Penulis

Jenis Bahan: Pilih Semua Jenis Bahan

- Akhbar (115,530)
- Buku (862)
- Majalah (1,981)
- Efemeral (36)
- Teks Sastra (836)
- Kertas Kerja (154)
- Perbahasan

Tajuk:

Tajuk penuh atau sebahagian. Pisahkan nama-nama dengan koma (,) untuk memasukkan lebih dari satu nama.

Bidang:

Konteks: Hadkan lingkungan konteks: kata ke kiri dan ke kanan.

Bilangan Output: 100 kata % Semua

Hak Cipta Terpelihara 2010-2013 Dewan Bahasa dan Pustaka.
Paparan terbaik Internet Explorer 9.0, Chrome 23 dan Firefox 16, dengan resolusi skrin lebar 1600 piksel atau lebih.
Korpus DBP secara automatik tidak berfungsi sekiranya tidak aktif/URL yang dilancarkan dalam tempoh 30 minit.
Korpus DBP 0.0.0.0 di dibina dengan menggunakan: Perl Framework 4.0.10110.41000 dan PHP 5.1.6.

<http://sbmb.dbp.gov.my/korpusdbp/SelectUserCat.aspx>

MATRIX SENTENCE TEST (MST)

It is a speech recognition tests with sentence-based test material

The sentences are generated by a 50-word base matrix

The sentence has a fixed grammatical structure but semantically unpredictable

Different word lists for adult and paediatric populations

MST for both populations are available in languages like Russian, German and Polish,

For Malay, only the list for adult population is available (Jamaluddin, 2016)

What is MST for?

- To **assess** and **diagnose** peripheral and central hearing impairments;
- To **verify** and **monitor** the rehabilitation outcomes of amplification and;
- For **research** applications



Malay MST

- An example of the matrix for adults
- These words can be randomly combined to create 100 000 sentences (10^5).
- During the test, patients listen to these sentences (varied intensity) and repeat them to determine their hearing level.

SUBJECT	VERB	NUMBER	OBJECT	ADJECTIVES
Saya I	bagi give(s)	satu one	bola ball	baru new
Kita We	ada have/has	dua two	buku book	besar big
Dia He or she	dapat receive(s)	banyak many	baju shirt	lama old
Kami Us	perlu need(s)	semua all	lampu lamp	kecil small
Ibu Mom	beri give(s)	tiga three	meja table	merah red
Abang Brother	ambil take(s)	empat four	kotak box	hitam black
Ayah Dad	mahu want(s)	lima five	kunci key	putih white
Adik Younger sibling	suka like(s)	enam six	pisau knife	hijau green
Kakak Sister	nampak see(s)	tujuh seven	mangkuk bowl	mahal expensive
Nenek Grandfather	minta asked for	lapan eight	topi hat	cantik beautiful

Objectives of this study

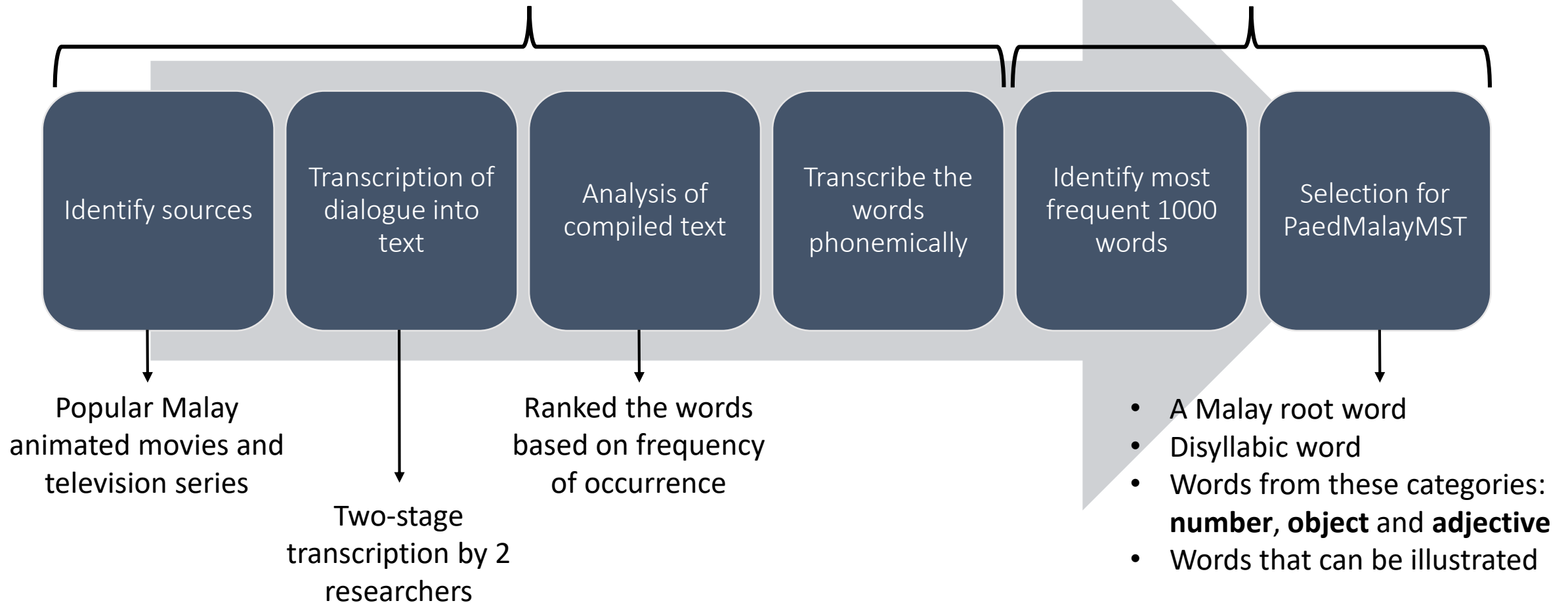
To produce a spoken Malay corpus for paediatric population

To identify spoken Malay words suitable for PaedMalayMST from this new corpus

Methodology

OBJECTIVE 1: To produce a database for spoken Malay corpus suitable for paediatric population

OBJECTIVE 2: To identify spoken Malay words for PaedMalayMST





The sources

Movies

- *Geng: Pengembaraan Bermula*
- *Boboiboy: The Movie*

TV series

- *Upin dan Ipin*
- *Ejen Ali*

RESULTS

Malay		Consonant																			Vowels						Diphthongs			S U M							
		Bilabial			Labio-		Alveolar					Post-alveolar			Palatal		Velar			Glottal		Front	Mid	Back													
		Nasal	Plosive		Fricative	Nasal	Plosive	Fricative	Approx imant	Lateral	Affricate	Fricativ	Nasal	Approx imant	Nasal	Plosive	Fricativ	Stop	o h r	t e r																	
m	p	b	f	v	n	t	d	s	z	r	l	tʃ	dʒ	ʃ	ɲ	J	ŋ	k	g	h	ʔ	w	ɪ	ə	ɛ	æ	u	o	eɪ	eu	oi						
ni	ni					1																		1											2		
kau	kəu																															1			2		
aku	əku																																			3	
tak	tək									1																										3	
tu	tu									1																										2	
apa	əpə		1																																	3	
ha	hə																																			2	
la	lə																																			2	
dia	dɪ												1																							3	
dah	də												1																							3	
kita	kɪtə													1																						4	
hah	həh																																			3	
mana	mənə		1							1																										4	
eh	eh																																			3	
nak	nəʔ									1																										3	
ochobot	oʃobət																																			6	
ada	ədə																																			3	
ke	kə																																			2	
jangan	dʒəŋən																																			5	
boboiboy	boboiɔi																																			1	2
sini	sɪni																																			4	
huh	huh																																			3	
saya	səjə																																			2	
yang	jəŋ																																			2	
lagi	ləgi																																			4	
cepat	tʃəpət																																			5	
je	dʒə																																			2	
kat	kət																																			3	

Objective 1

To produce a database for spoken Malay corpus suitable for paediatric population

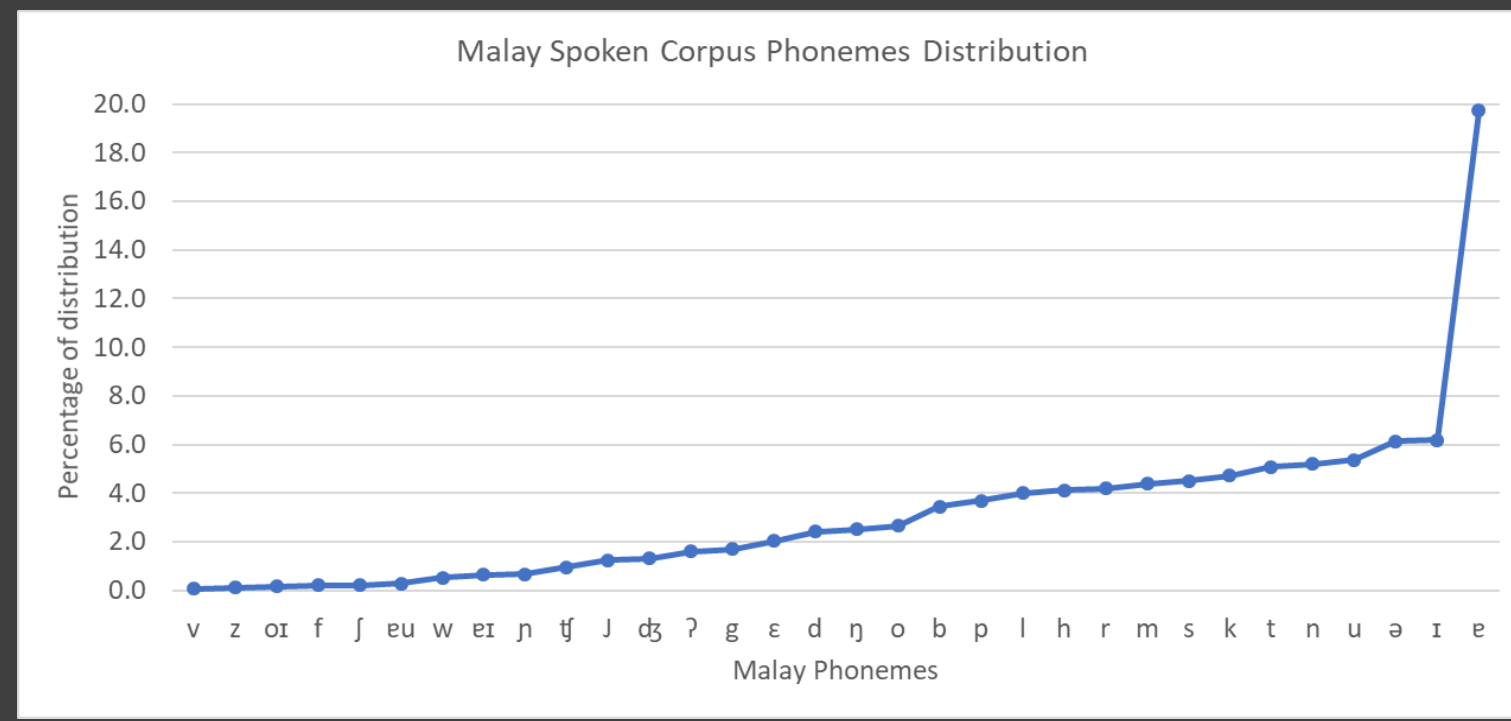
A total of 1900 words were catalogued

Words were ranked according to the frequency of occurrence

Transcription of compiled words

- Analysed Phonetic and phonemic distribution

The distribution of Malay phonemes



To ensure the frequency of phonemes in the corpus is represented equally in the PaedMalay MST

Objective 2
To identify
spoken
Malay words for
PaedMalayMST

Inclusion criteria	Categories		
	Number	Object	Adjectives
First 1000 words	7	58	85
Disyllabic words	4	48	70
Words that were difficult to illustrate	0	2	69
Final words selected	4	46	1

Examples of the illustrations of words selected from the corpus

Number

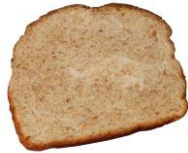
Object

Adjective

1



2



3



5



Discussion

1. Linguistic scenario

- More mix-code
- Frequently used phonemes
- Fluidity of language
- Shed new lights on the study of Malay
- Contribute to the literature of Malay linguistics

2. The PaedMalayMST

- First step for the purpose of this test
- Selection of words
- The use of illustration
- Comfortability
- Focus on the hearing test- for children with speech impairment

3. Good health and wellbeing (SDG 3)

- Appropriate management and rehabilitation
- Late detection and intervention for paediatric patients may lead to cognitive issues which may hamper their learning
- If the children with hearing impairment are given proper rehabilitation, it will improve their speech language, reading and cognitive ability. (Mendel, 2008)
- Better quality of life leads to good health and well being

Recommendation



This corpus can benefit many fields, not only limited to clinical use



Education-language can make use of the words compiled for classroom teaching



Psychology



The possibility is endless!

Conclusion

Familiarity of words among Malay speaking paediatrics

Words extracted were analysed further for the list

The three-category matrix for the PaedMalayMST consists of at least four words in each category except for only one word in adjective category.

Inclusion of more words from other database

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