



REPETITION TEST AS A SCREENING TOOL FOR THE CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENT (SLI)

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1. PROBLEM STATEMENT

SPECIFIC LANGUAGE IMPAIRMENT

DO'S

Regular school



IQ normal



Fail in comprehension & production test



DON'T



Hearing impairment



Abnormalities of oral structure

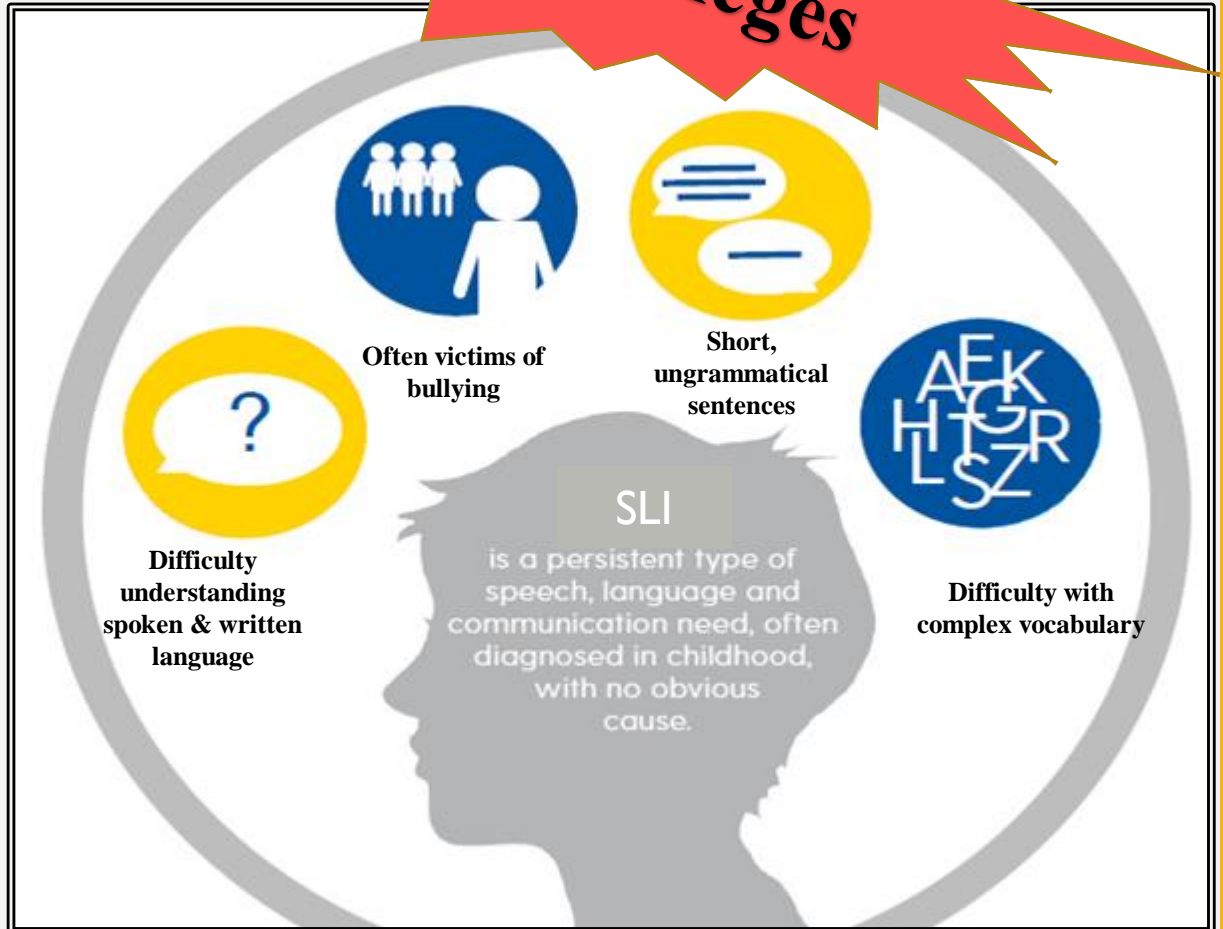


Obvious neurological impairment



Pervasive developmental disorder

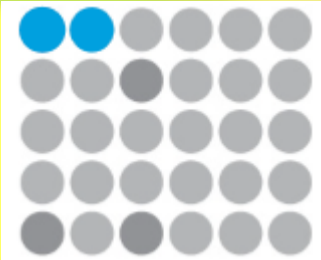
Challenges



Global Trends

SLI is an invisible, under diagnosed condition that affects over **70%** of children.

2 *in* 30 children have **SLI**.



That's **two kids** in every classroom.

Between **5-7 million** children in the US are affected.

15-20% vs **2** years old vs speech **delay**

4-5 years old
vs
typically
developing

5-8%
vs language **disorder**



Dr Raja Juanita Raja Lope
Consultant Developmental and General Paediatrics

“Kesimpulannya, kajian menunjukkan **intervensi awal** penting untuk menyokong anak yang mempunyai **masalah pertuturan dan kefahaman**. Kesedaran antara **ibu bapa, penjaga** dan **guru** penting untuk memastikan tindakan yang sewajarnya diambil,”

CAKNA PERTUTURAN ANAK ANDA



Pantau kecelaruan bahasa

[f Share](#) [Tweet](#)

MyMetro > Node



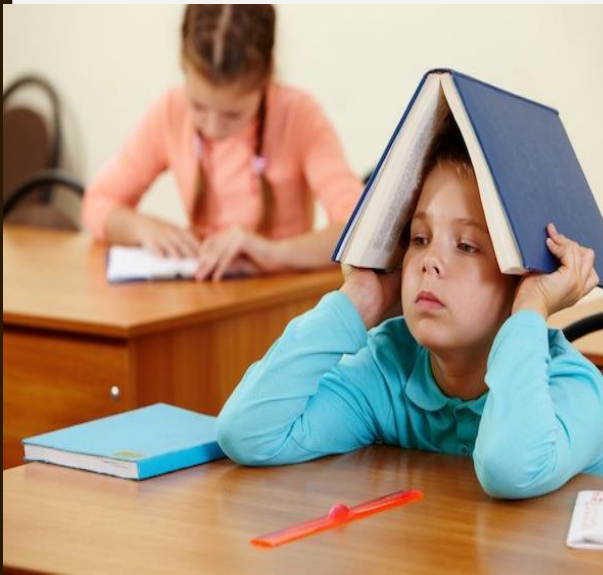
Masalah pertuturan kanak-kanak jangan dipandang remeh

Oleh Halina Mohd Noor - Ogos 25, 2017 @ 10:24pm
halina_mdnoor@bh.com.my



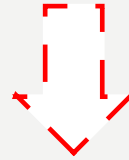
PROBLEM...

- There are difficulties in identifying children with SLI; in particular, language tests commonly used by speech pathologists or therapists have not been standardized on children.

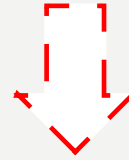




2. SOLUTION TO THE PROBLEM



REPETITION TEST



- The **diagnostic language tool** included **repetition test** and repetition tasks that proved to be **sensitive** for the detection of SLI in previous studies.

A collaborative effort:

Universiti Sains Malaysia



SMK Telok Kumbar

3. NOVELTY & INVENTIVENESS

Three Type of Sentences

Design the Procedure of Repetition Test

Validity

Repetition Test

Input

Ibu mencari buku yang ayah telah baca

Ibu mencari baju dan ayah membaca buku

Ibu memberitahu anaknya bahawa ayah telah menari

[list
[Rea



eat
nce]



Output

EACH PRODUCTION IS SCORED DEPENDING ON SEVEN SCORING METHODS

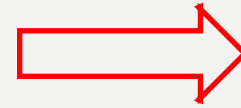
- Correctness of the sentence (*SENT*)

- Number of words (*NBR*)

- Syntax (*SYNT*)

- Verb morphology (*MORPH*)

Morphosyntactic



Sentence
problem

- Functional words (*FUNC*)

- Lexical words (*LEX*)
















- Semantic (*SEM*)

Lexico-semantic



Meaning
problem

4. COMPETITORS

Feature	Conventional Method (Paper-Pen)	Repetition Detector 1.0 & 2.0	Repetition Test (Web Application)
Purpose (Clinical/Screening)			
Technology			
Save			
(a) Save environments (Paperless)			
(a) Save time & energy			
Data collection			
(a) Virtual			



5. PRACTICALITY

- Analysis indicates fulfillment of intended use cases and objectives
 - ✓ Cost reduction in terms of SLI diagnosis and treatment
 - ✓ Reduced ties of SLI diagnosis to costly equipment
 - ✓ Web application model guarantees wide availability and far reach
- Ease of use
 - ✓ Intended for use under supervision of speech-language pathologist
 - ✓ Relatively simple, straightforward use cases

6. DUE DILIGENT

Speech Repetition Test

... is a screening tool to aid the diagnosis of Specific Language Impairment (SLI) among children. Based on the use of sentence repetition tasks to assess the

Speech Repetition Test

Click on the start button and verbally repeat the sentence displayed into the microphone
Click on the sentence to play speech audio

Pagi ini ibu mencari buku yang ayah telah baca

pagi ini ibu menari buku yang ayah baca

SENT = 0
NBR = 0
SYN = 1
FUNC = 4
LEX = 2
SEM = 0

Score: 7

Next

Start



7. IP/COPYRIGHT/GRANT/PUBLICATIONS

IP/COPYRIGHT

- (1) SR2019000364**
- (2) LY2021P00619**

GRANT

- (1) Short Term Grant**
304/PHUMANITI/6315349
RM 19,514.00
1 Oktober 2019-30 September 2021

PUBLICATIONS

Jong Hui Ying & Rozaida Abdul Rauf. Kesan Minimaliti dalam Pemahaman Kecelaruan Bahasa Spesifik Sintaksis. In Rozaida Abdul Rauf (ed.), *Neuropsikolinguistik*. Penerbit USM (Universiti Sains Malaysia). (Forthcoming)

Ch'ng Yan Huan, Mohd Azam Osman, & Jong Hui Ying. An Innovation-Driven Approach to Specific Language Impairment Diagnosis. *Malaysian Journal of Medical Sciences* (Accepted, Forthcoming).

Ch'ng Yan Huan, Mohd Azam Osman, & Jong Hui Ying. Psychology Software Tool (PST) For Specific Language Impairment Person. *Walaiyak Journal of Science and Technology* (Accepted, Forthcoming).

Nurul Nazihah Zaidil, Tahamina Begum, Rozaida Abdul Rauf, Jong Hui Ying, Faraj Al-Marri, & Faruque Reza. (2018). Syntactic Language Processing among Women- An EEG/ ERP Study of Visual Pictorial Stimuli. *2018 IEEE-EMBS Conference on Biomedical Engineering and Sciences (IECBES)*.

Jong Hui Ying dan Rozaida Abdul Rauf (2015), Pemahaman Klausa Relatif Tanpa Tikas dalam kalangan Pesakit Afasia Broca Agramatik dan Wernicke Bahasa Pertama Bahasa Malaysia, in Rogayah Rajak and Radiah Yusoff, Teori Sintaksis Bahasa Melayu, Dewan Bahasa dan Pustaka.

Jong Hui Ying dan Rozaida Abdul Rauf (in press), Kesan Minimaliti dalam Pemahaman Kecelaruan Bahasa Spesifik Sintaksis, In Rozaida Abdul Rauf (ed.), *Neuropsikolinguistik*, Penerbit Universiti Sains Malaysia.



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UNIVERSITI PUTRA MALAYSIA

AiIC
2020

Best Paper Award **AiIC2020**

PSYCHOLOGY SOFTWARE TOOL (PST) FOR SPECIFIC
LANGUAGE IMPAIRMENT PERSON

by

Y.H. Ch'ng, Mohd Azam Osman, H.Y. Jong
Universiti Sains Malaysia

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10 February 2019

Dr. Jong Hui Ying
Pusat Pengajian Ilmu Kemanusiaan,
Universiti Sains Malaysia,
11800, Pulau Pinang.

Dear Dr. Jong,

RE: Business proposal

Do you want to expand your business other than spending money on getting a new lead every month? This letter is specifically written to propose a business idea which can work great when everything falls into place though and you certainly have a tremendous opportunity to rise as well as make more money.

DanMedik has been helping the businesses like you for over a decade now to expand. You are a researcher on psycholinguistics who knows how people acquire, create, and understand language. In recent years, all these areas of psycholinguistics have been assisted by technological advances, especially the advent of brain imaging equipment; and we are medical equipment supplier, we need an essential role from a psycholinguist to explain the obtained data from the medical equipment, as well design and test certain psychological experiment by using our medical.

We think this arrangement of collaboration would provide your research with a real profile boost through our medical equipment. We think this arrangement could also benefit the community through strengthening our medical equipment and continuing to give local community the best service.

It would be great if we could arrange a meeting and discuss in detail about this project. You can contact us on to set a meeting or for any other questions. Contact us to see how we can save you money and generate new business.

Yours sincerely,



Daniel Chan
Director
Mobile: +6012-2712273

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8. STATUS OF INVENTION

TRL 6:

Tested in intended
environment close to
expected performance

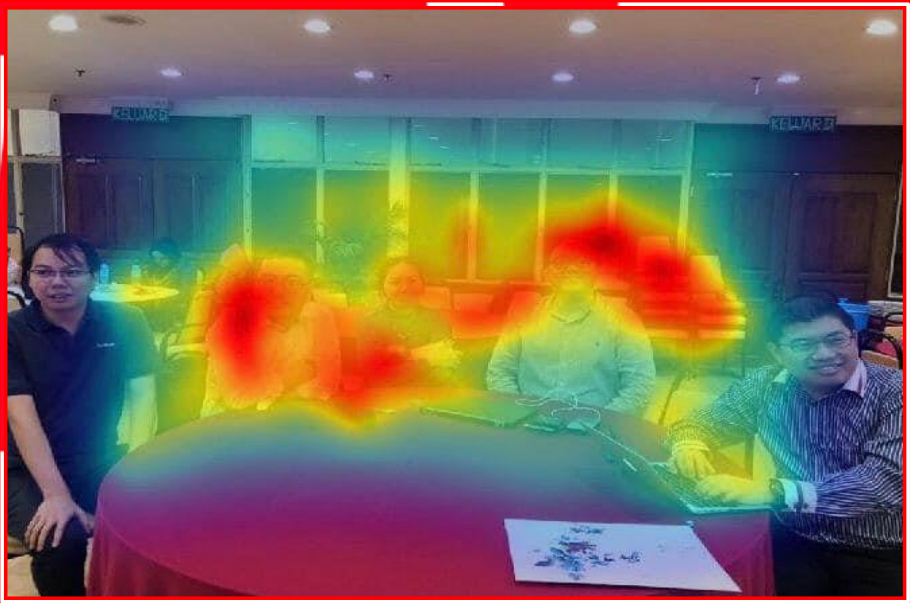
9. COMMERCIALIZATION

- Web-based application introduces new potential business models
 - (i) Subscription based? One time purchase? Free w/ premium features?
 - (ii) Repetition test initially conceived without intent for profit due to ethical reasons
- Clear potential market and customer base
- Lacks competition
 - No well-known web service which offers SLI diagnosis and treatment in Malaysia

10. POTENTIAL PARTNERS



**Medical
Instruments**





11. IMPACT OF THE PRODUCT



Speech Repetition Test

Click on the start button and verbally repeat the sentence displayed into the microphone
Click on the sentence to play speech audio

Pagi ini ibu mencari buku yang ayah telah baca

Score: 0

Start



Speech Repetition Test

Click on the start button and verbally repeat the sentence displayed into the microphone
Click on the sentence to play speech audio

Overall Results

Total Score: 155

Total SENT : 10
Total NBR : 11
Total SYN : 10
Total FUNC : 60
Total LEX : 45
Total SEM : 19

Q1 . Pagi ini ibu mencari buku yang ayah telah baca
Q2 . Pagi ini ibu mencari kasut dan ayah membaca buku
Q3 . Pagi ini ibu memberitahu anaknya bahawa ayah telah menari
Q4 . Malam ini ayah memberitahu anaknya bahawa ibu telah menyanyi
Q5 . Malam ini ayah mencari majalah yang ibu telah baca
Q6 . Malam ini ayah mencari selimut dan ibu memasak air
Q7 . Pagi ini adik mencari toaleta dan abang mencuci kereta
Q8 . Pagi ini adik memberitahu kakaknya bahawa abang telah menari
Q9 . Pagi ini adik mencari kunci yang abang telah simpan
Q10 . Petang ini adik mencari keropok yang ibu telah sembunyi
Q11 . Petang ini adik mencari gunting dan ibu memasak bubur
Q12 . Petang ini adik memberitahu ibunya bahawa abang telah jatuh
Q13 . Malam ini kakak memberitahu ibunya bahawa adiknya telah menangis
Q14 . Malam ini kakak mencari baju yang ibu telah lipat
Q15 . Malam ini kakak mencari benang dan ibu menyapu lantai

Obtained speech:

Q1 . Pagi ini ibu cari buku yang ayah baca
Q2 . Pagi ini ibu mencari kasut ayah baca buku
Q3 . Pagi ibu beritahu anaknya bawa ayah telah menari
Q4 . Malam ini ayah memberitahu anak yang ibu menyanyi
Q5 . Malam ini ayah mencari majalah yang ibu telah baca
Q6 . Malam ini ayah mencari selimut dan ibu memasak air
Q7 . Pagi ini adik mencari toaleta dan abang mencuci kereta
Q8 . Pagi ini adik memberitahu kakaknya bahawa abang telah menari
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Auto calculation

Reload



Speech Repetition Test

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Click on the sentence to play speech audio

Overall Results

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Total SENT : 10
Total NBR : 11
Total SYN : 10
Total FUNC : 60
Total LEX : 45
Total SEM : 19

Reload

Q13. Malam ini kakak memberitahu ibunya bahwa adiknya telah menangis
Q14. Malam ini kakak mencari baju yang ibu telah lipat
Q15. Malam ini kakak mencari benang dan ibu menyapu lantai

Q	SENT	NBR	SYN	FUNC	LEX	SEM
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Pending fillup

PERSPECTIVE
OF SPEECH
PATHOLOGIST





THANK YOU!