

# Exploring the effect of Age of Onset of English acquisition (AO) on NHS and UPNG students' academic performance

Olga Temple & Sakarepe Kamene  
Linguistics SHSS UPNG

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# Unity in Diversity:

*Celebrating the Indigenous Languages of the South Pacific*



By union the smallest  
states thrive.  
By discord the greatest  
are destroyed.

Sallust (86-34 BC)

**Our challenge:** How can we ensure sustainable social and economic development of Papua New Guinea? And promote our beloved languages?

CRISPVS SALLVSTIVS

Crispus Romanus primus in historia  
In Thesaurio Christianæ Regiæ Aug.

**UNITY – the essential prerequisite for national survival**

**How can UNITY in DIVERSITY be achieved?**

**Unity** without uniformity, and

**Diversity** without fragmentation?

**Only through **effective communication** which ensures  
cooperation.**

# Society – the natural state of man



Destutt de Tracy (1754-1836)

*“... We are ... so organized, that we form judgments of that which we experience, ... of all which affects us; this always, and everywhere, produces the admirable and wise invention of a language”*

Society is *“purely and solely a continual series of exchanges”* made possible through HUMAN LANGUAGE

Born without language, we learn the 'communication code' used in our society.

But **'Nation States' are a thing of the Past**; in the Global Village, people's communication needs have increased, and particularly so in the post-colonial multilingual / multicultural societies.

Changing realities have endangered many ancestral languages, causing global concern → since 1953, UNESCO push for MT education

In PNG – Vernacular Education policy (mid-1990s – 2013)

Yet, there is a need for ***pragmatism***.

## **Knowledge Is Freedom:**

*“Ignorance is the only evil in this world”*

- Socrates

For a society to prosper, they must know how to solve problems.

Therefore, educating the young in a post-colonial multilingual society acquires ***existential*** importance.

# Standards at PNG's premiere university on the decline

Post Courier, September 5, 2019

Dropping standards in quality of education have been a concern in PNG for almost 20 years.

In the Linguistics Department, SHSS UPNG, we set out to investigate the **causes** of this decline.

The National – Friday, August 23, 2019

10 | **Nation**

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## **NRI: Drop in quality of education**

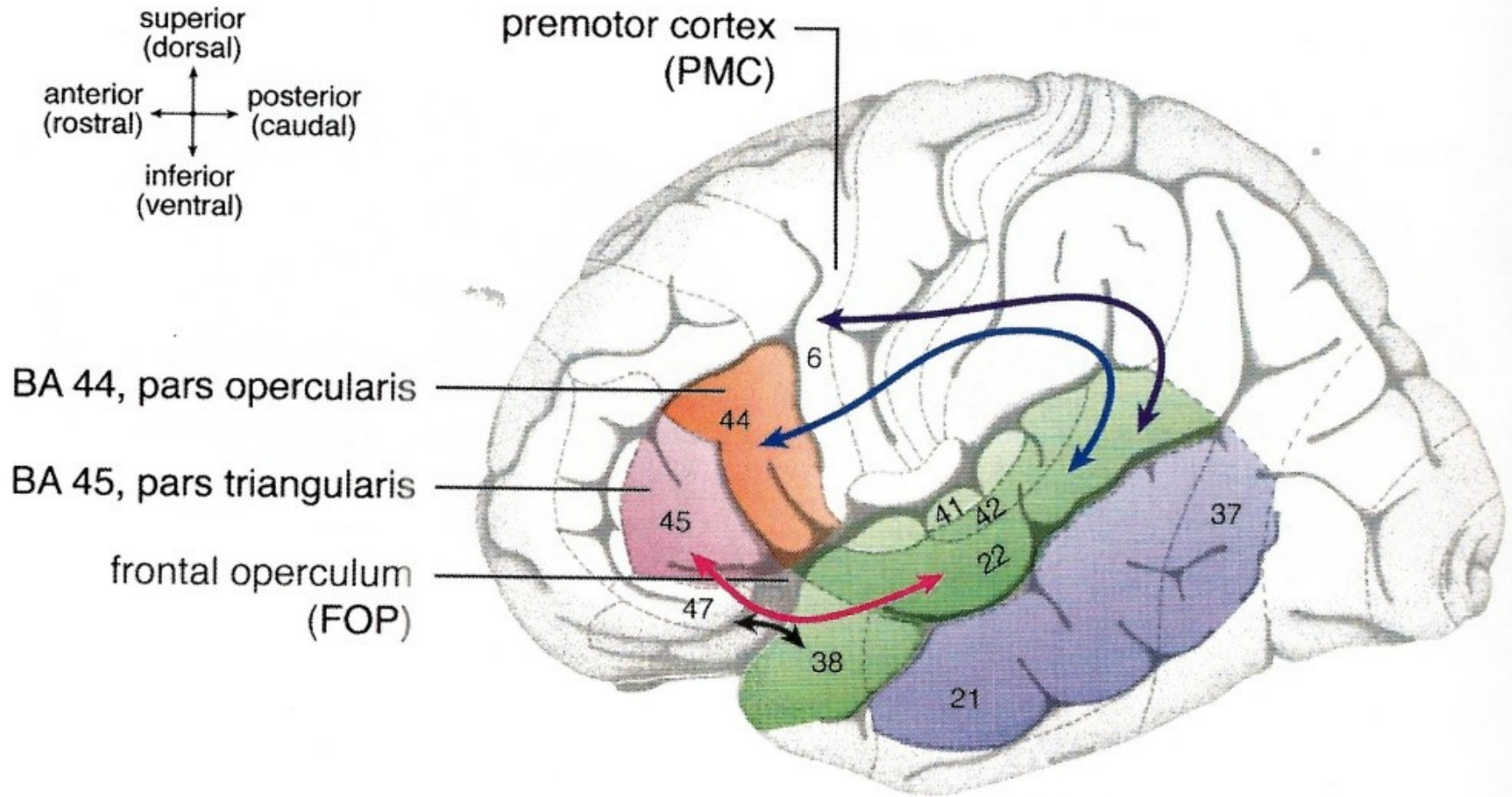
Since 2015, we carried out 7 major research projects, and have come up with important findings.

Our reasoning, and hypotheses, stem from the current understanding of

- the biological foundations of language
- how brain maturation affects and changes the *mechanism* of language acquisition.



# Neuroscience: the language-circuit



Language-related regions and high-speed fiber connections in the brain

We now have evidence that language processing is impossible without an efficient transfer of information between various language-supporting regions in separate parts of the brain.

Thick bundles of myelinated axons enable those “high-power” connections required for all language-relevant regions to work together as one system.

This neural language circuit has at least two dorsal and two ventral pathways:

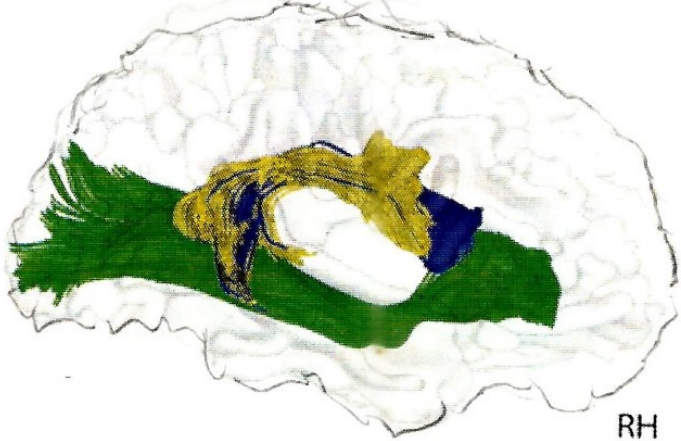
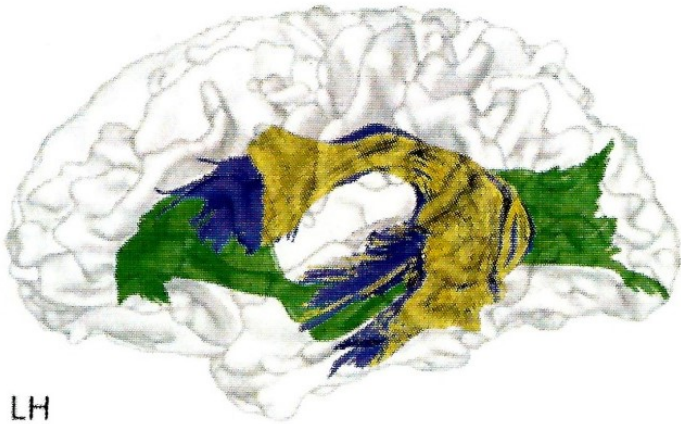
- the connection between temporal and premotor cortex supports speech production
- the connection between temporal cortex and Broca's area supports complex syntax, and the ventral fiber tracts sub-serve semantic and basic syntactic processes.

This integrated language-thought structure is unified by high-speed information transfer pathways which develop in the process of myelination of neuronal axons – as we see in the MRIs of an adult and infant brains, compared (next slide):

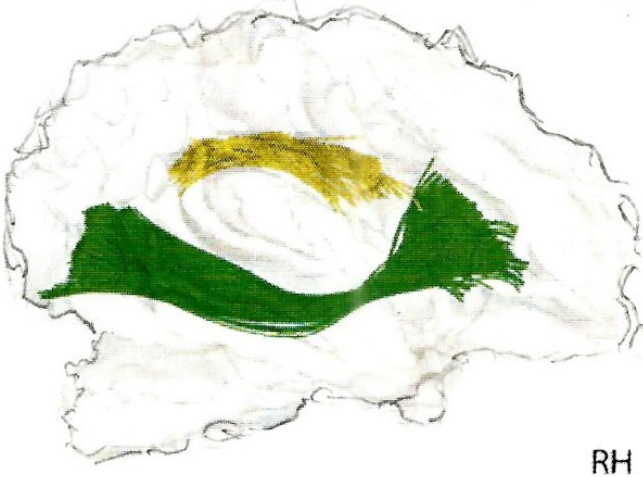
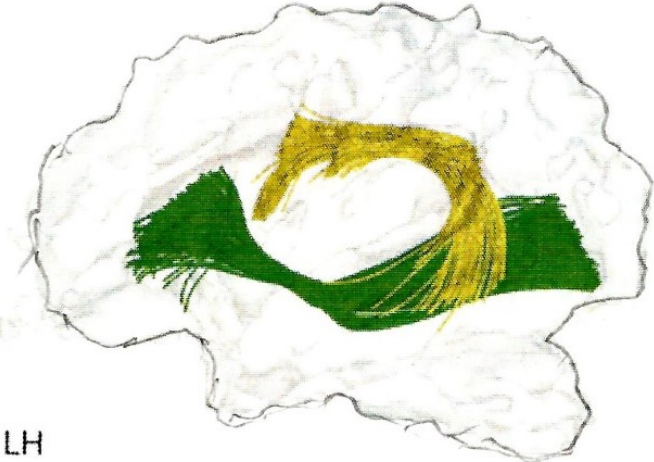
**THEY ARE NOT THERE AT BIRTH!**

# Neuroscience: Biological Foundations of Language

**A** Adults



**B** Newborns



It is now clear that FLA is a function of the gradual integration of all language-related areas in the course of brain maturation. Bundles of myelinated axons “... form a complete ‘ring’ that ... must be in place in order that syntactic processing work”.

**Panel A** illustrates adult connectivity, in both the left and right hemispheres, while

**Panel B** displays newborn connectivity. In adults (panel A) the “ring” connecting ventral to dorsal areas is complete, with green, yellow and blue portions indicating the ventral and dorsal fiber connections.

However, at birth, the blue connections are missing; they are not yet myelinated. These are the connections to Broca’s area. It is as if the brain is not properly ‘wired up’ at birth to do syntactic processing.

These fiber tracts mature and become functional by about ages two to three, in line with what we know about language development.

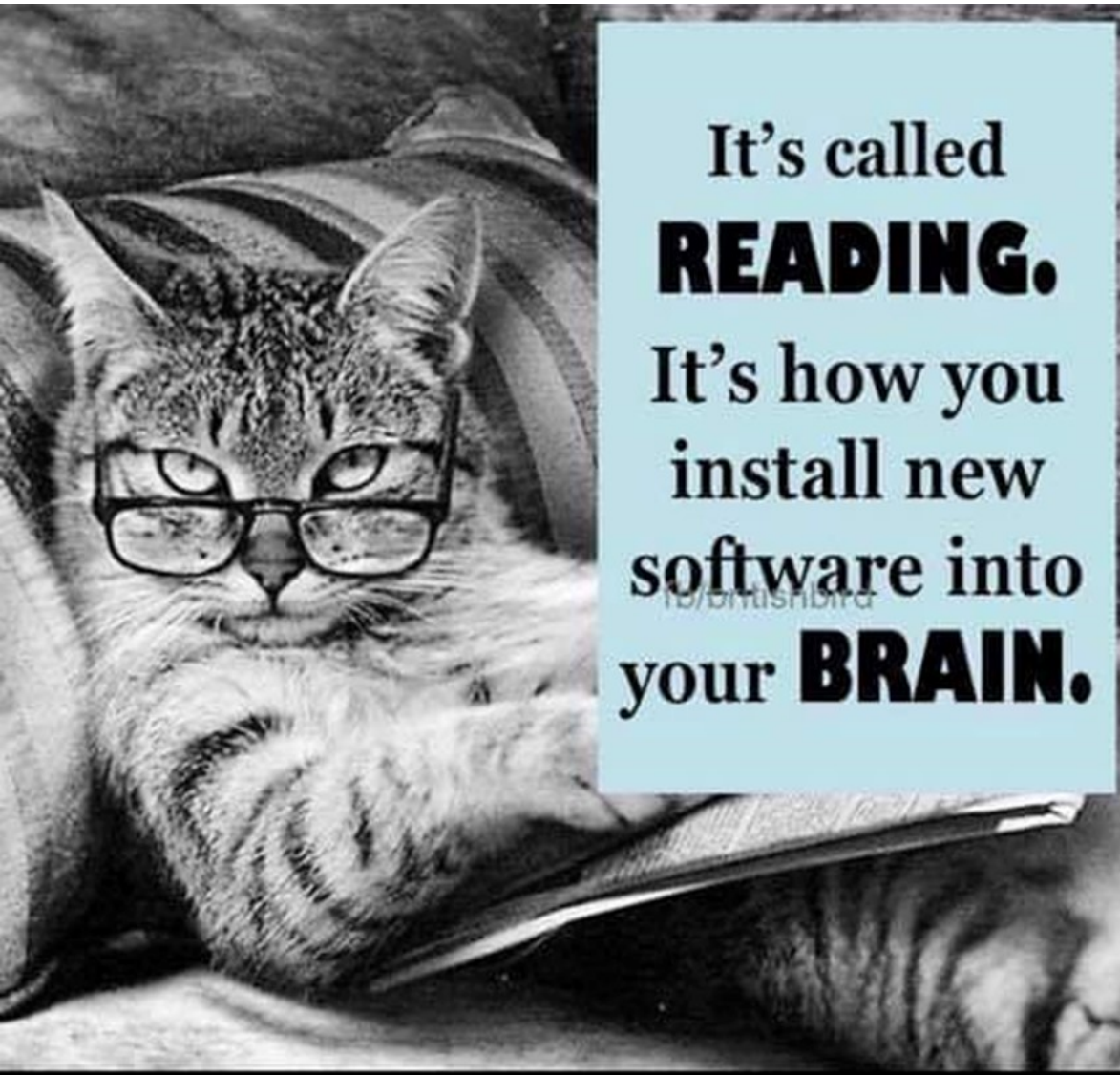
In contrast, at birth the tracts responsible for auditory processing are functional, and during the first year of life children acquire the sound system for their language.

## Our Premises:

- **AGE** affects the process of acquisition of many skills – *sic!* – also language (CPH)
- Humans learn mostly through Language; → **Verbal Thought** ( $= \lambda$ ) is a learning **TOOL**
- No job can be done if you don't know how to use a required tool



# ABCs



It's called  
**READING.**  
It's how you  
install new  
software into  
your **BRAIN.**

A TOOL must be fit for each task:

- we can't do surgery with a bush knife or drill teeth with an industrial drill!

To learn in PNG schools, children must be skilled in **English** – it is their

**LEARNING  
TOOL**



## Research design, aims and objectives:

- Admittedly, many factors affect students' performance; we focused mostly on three of them: AO, AGELIT, and ELL
- Conducted surveys (SAQs), collecting data on students' language education backgrounds (AO, AGELIT, ELL)
- Matched data with individual students' academic scores
- Conducted statistical analyses (SPSS V20), measuring the effect size of all three factors on students' academic grades.

## Our published work so far:

- **Effect of Early Language Education on UPNG Students' Academic Performance.** LLM Vol. 33(2), 2015, pp. 77-92. [www.langlxmlanesia.com](http://www.langlxmlanesia.com)
- **Effect of Early Language Education on Students' Academic Performance: the POMNATH case study.** Proceedings of the LSPNG 2016 International Conference in Ukarumpa, Eastern Highlands Province, Papua New Guinea, pp. 52-79.  
[www.langlxmlanesia.com/Temple\\_LSPNG%20Proceedings%202016%20FV.pdf](http://www.langlxmlanesia.com/Temple_LSPNG%20Proceedings%202016%20FV.pdf)
- **Effect of early language education on the academic performance of National High School (NHS) students in Papua New Guinea.**  
LLM Vol. 35, 2017

## Our published work so far:

- **Does the effect of cortical myelination at the Age of Onset of Second Language Acquisition (SLA) affect the students' academic performance? A University of Papua New Guinea case study.** PJMS Vol. 18 No. 2, 2018, pp. 15-34 [www.pacjmedsci.com](http://www.pacjmedsci.com)
- **NRI Blog** <https://pngnri.org/index.php/blog/121-the-earlier-png-kids-learn-english-the-better-they-do-in-school>
- **Exploring the relationship between age of onset of learning English and student academic performance: evidence from Papua New Guinea.** Pacific Journal of Medical Sciences, Vol. 19, No. 1, December 2018. Pp. 59 - 69. [www.pacjmedsci.com](http://www.pacjmedsci.com)

## Summary of findings:

Compelling analyses consistently suggest a robust causal and statistically significant negative correlation between AO, AGELIT, and ELLs other than English on students' grades.

N.B. Our findings are in line with those of the *One Village One Pre-school* (OVOP) project in rural China, which also indicates “Long-term AO effects” on students' academic performance.

## Conclusions

Appropriate language skills must be taught in pre-school – purpose (education)

Community languages must be taught also – children CAN learn more than one language!

## **2018-2019 Research: UPNG; SMHS; POMNATH**

Our senior linguistics students will now present the results of their just concluded POMNATH study.

We thank Mr. Maito and Mrs. Gwaibo, POMNATH Vice-Principals, for their invaluable support in this important research.

## References

1. **Temple, O., Kamene, S., Guldán, G., & Maito M.** Effect of Early Language Education on Students' Academic Performance: the POMNATH case study. Proceedings of the LSPNG 2016 International Conference in Ukarumpa, Eastern Highlands Province, Papua New Guinea, pp. 52-79.  
[www.langlxmlanesia.com/Temple\\_LSPNG%20Proceedings%202016%20FV.pdf](http://www.langlxmlanesia.com/Temple_LSPNG%20Proceedings%202016%20FV.pdf)
2. **Temple, O., Dalsgaard, S. & Kamene, S.** Effect of Early Language Education on UPNG Students' Academic Performance. LLM Vol. 33(2), 2015, pp. 77-92.  
[www.langlxmlanesia.com](http://www.langlxmlanesia.com)
3. **Temple O., Ezebilo E., Hane-Nou G., & Kamene S.** Effect of early language education on the academic performance of National High School (NHS) students in Papua New Guinea. LLM Vol. 35, 2017
4. **Temple, O.** Does the effect of cortical myelination at the Age of Onset of Second Language Acquisition (SLA) affect the students' academic performance? A University of Papua New Guinea case study. PJMS Vol. 18 No. 2, 2018, pp. 15-34  
[www.pacjmedsci.com](http://www.pacjmedsci.com)

## References (continued)

5. **NRI Blog** <https://pngnri.org/index.php/blog/121-the-earlier-png-kids-learn-english-the-better-they-do-in-school>
6. **Temple, O. & Syeda, S.** Exploring the relationship between age of onset of learning English and student academic performance: evidence from Papa New Guinea . Pacific Journal of Medical Sciences, Vol. 19, No. 1, December 2018. Pp. 59 - 69. [www.pacjmedsci.com](http://www.pacjmedsci.com)
7. **Si Chen et al.** Long-term effects of China's **One Village One Preschool** program on elementary academic achievement. Early Childhood Research Quarterly 49 (2019) 218-228. [https://www.researchgate.net/publication/334807992 Long-term effects of China's One Village One Preschool program on elementary academic achievement](https://www.researchgate.net/publication/334807992_Long-term_effects_of_China's_One_Village_One_Preschool_program_on_elementary_academic_achievement)