Foreign Language Anxiety (FLA) and Domain Word Learning

Brendan Weekes
Laboratory for Communication Science, The University of Hong Kong
Science of Learning Strategic Research Theme, The University of Hong Kong
Professorial Fellow, School of Psychological Sciences, University of Melbourne

Introduction

- Some students report high levels of anxiety when learning a second language (MacIntyre, 2017).
- Foreign language anxiety (FLA) is high in Asian students (Jin et al. 2015) and may be different for females and males (Park & French, 2013).
- FLA has a complex effect on learning. On the one hand, too much anxiety can diminish allocation of attention and capacity of working memory (WM) (Côté, 2017). On the other hand, a little FLA can have a positive effect on learning (Tsui, 2016).
- Gender can be an important biological factor in anxiety. However, the findings concerning correlations between FLA and gender have been contradictory.
- Salivary cortisol (CORT) is also correlated with brain activity in males, whereas a lower degree of correlation with cortisol is observed for women (Wang et al., 2007).
- Weekes (2017) has recently developed a paradigm to better examine technical vocabulary (domain word) learning in a non-native language.

Objectives

- To correlate subjective measures of FLA with biomarkers of anxiety in students who are learning technical vocabulary in a non-native language.
- To validate a wearable measure of electrodermal activity (EDA) called Empatica for the purpose of recording FLA in real time.
- To test the statistical significance of interactions between biomarkers and gender in domain word learning

Preparatory Study (Weekes, 2017)

- Twenty -eight participants (7 males, mean age=19.11, SD=0.57) were recruited from the first-year cohort of a four-year tertiary programme.
- Testing of expert word recognition and recall was performed 12 months after Phase One with 25 participants (89%) of the sample recruited.
- A total of 14 tasks were administered: Expert word recognition, Flanker, Stroop, Serial order reconstruction task, Digit span, Word span, Nonword span, Corsi-block tapping, Raven's Progressive Matrices, Controlled Oral Word Association Test, British Picture Vocabulary Scale, Cantonese Naming, English Naming, Cantonese translation, English translation, and Self-rated language questionnaire.
- In Phase 1, participants performed tasks assessing expert word knowledge, serial order reconstruction, verbal and nonverbal executive control, verbal STM, intellectual ability, self-rating of Cantonese and English exposure and number of hours per week studying in English. In Phase 2, expert word knowledge was reassessed with a lexical decision task. In Phase 3, expert word knowledge was reassessed with a lexical decision task and writing to dictation task. Phase 3 was conducted 12 months after the end of Phase 2.

Results

Table 1: Multiple regression results predicting L2 written expert word learning (Phase 2-Phase 1)

Predictor variables	β	t	p
Serial reconstruction	.60	4.08	.001*
Academic materials	.39	2.87	.01*
Flanker	.01	0.06	.95
Stroop	–.01	–0.06	.96
BPVS	.11	0.81	.43

*$p < 0.05$

Table 1: Multiple regression results predicting L2 written expert word lexicalization (Phase 3)

	Lexical Tasks					
	Lexical decision			Writing-to-dictation		
Predictor variables	β	t	p	β	t	p
Serial reconstruction	–.01	.06	.96	.12	.62	.55
Nonword repetition	–.02	–.10	.93	–.18	–.93	.37
Flanker effect	.06	.24	.81	–.13	–.71	.49
Stroop effect	–.37	–1.4	.17	.42	2.2	.045*
Raven's matrices	.19	.74	.47	.43	2.3	.035*

*$p < 0.05$

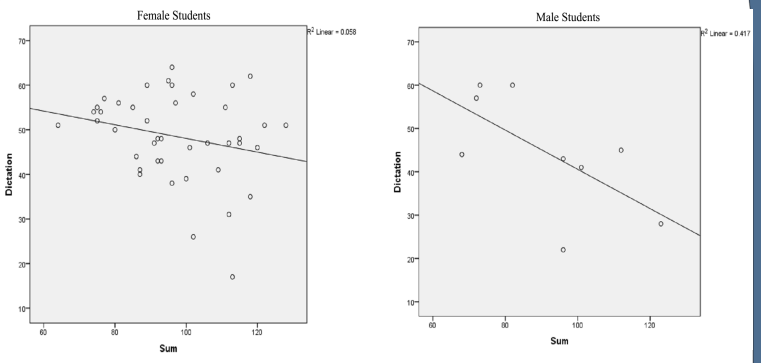

Figure 1: Correlation between Dictation and FLA in female and males students

EDA Pilot Study

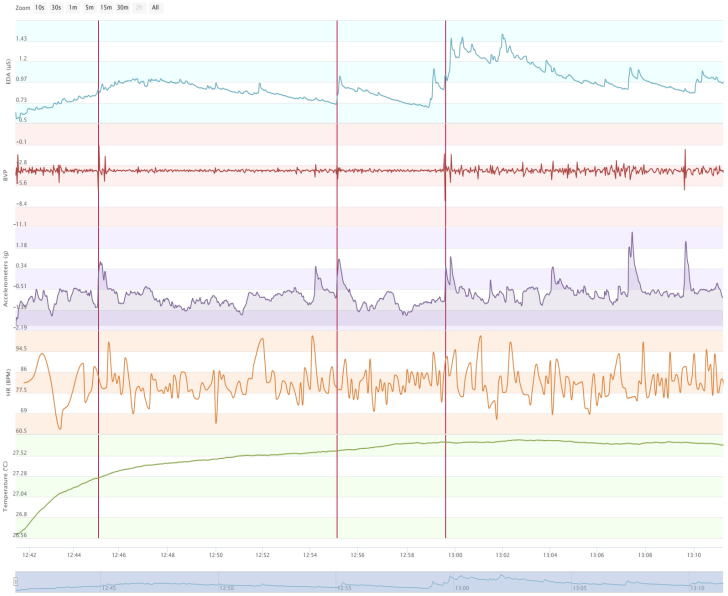

Figure 2: Graph showing different physiological features recorded by the wristband. From the left the blocks represent rest, expert words dictation, general words dictation, and writing task.

Conclusion

- EDA is highly correlated with other subjective measures of FLA, and thus could be used as a valid equipment for measuring FLA in real life classroom situations when students are engaged in the learning process.
- Given the limited amount of data we have on in the pilot study, we cannot yet determine the interaction between EDA measures and gender
- The present study is a theoretical advance on previous studies because it uses objective biomarkers of FLA. This will open a new field by linking FLA with animal models in neuroscience (Tang et al. 2014) and motivate fresh studies in the cognitive neuroscience of emotion and learning (Wang et al. 2007)

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