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Assessment of Marcin Naranowicz's PhD dissertation

Decision: positive evaluation - the PhD candidate can proceed to the final stages towards earning a PhD title

Mr Marcin Naranowicz presents a thesis entitled 'How mood influences native and nonnative language processing: Behavioural and electrophysiological evidence' in the aim of obtaining the title of Doctor from Adam Mickiewicz University. The thesis includes studies presented in the format of four scientific papers that primarily aimed at examining the impact mood may have on emotional words and sentence processing in first (L1) and second language (L2) users. I briefly sum up the articles, the main research questions, and conclusions.

The first article entitled 'Mood and gender effects in emotional word processing in unbalanced bilinguals', Mr Naranowicz and collaborators investigated the relationship between mood and emotional word processing in the bilingual context, as modulated by participants' gender. After inducing positive or negative mood, they asked participants to perform an emotional decision task. From their results they concluded that mood influences how unbalanced bilinguals respond to emotional words. They also reported that participants' gender plays a role in emotional word processing.

In the second article entitled 'In a Bilingual Mood: Mood Affects Lexico-Semantic Processing Differently in Native and Non-Native Languages', the PhD candidate and collaborators examined the effects of positive and negative moods on L2 processing. Using event-related brain potentials (ERPs), they recorded Polish-English highly proficient bilinguals' brain activity when they read meaningful and meaningless sentences in their L1 or L2 after positive and negative mood induction. The differences observed in various ERP components led the authors to conclude that mood affects lexical, lexico-semantic, and semantic processing differently in L1 and L2.

In the third article entitled 'Positive and negative moods differently affect creative meaning processing in both the native and non-native language', Mr Naranowicz and collaborators used

ERPs to investigate whether the processing of novel metaphoric, literal, and anomalous sentences is equally affected by mood in L1 than in L2. They observed an effect of mood that was not modulated by language.

Finally, in the last article, Mr Naranowicz presented a single-author review paper entitled 'Mood effects on semantic processes: Behavioural and electrophysiological evidence'. After reviewing behavioural and electrophysiological studies on the effect of mood on language processing and discussing their findings within theoretical frameworks, the author drew conclusions and proposed directions for future research.

Strengths of the dissertation

The dissertation is well written and nicely organised. The overall question addressed in the thesis is nicely presented in the Introduction and the research question of each article is clearly defined. Moreover, the link between each article (and therefore, each research question) is explicitly stated, which shows the coherence between the articles and of the work in general.

The topic is important for the literature on bilingualism and the thesis tackles the questions with a combination of methodologies, paradigms and analyses that provide a new insight on it. Moreover, in addition to adding to the current scientific literature, the thesis is also relevant for society because it helps better understand how our mood affects multilingual communication.

The thesis carried out by Mr Naranowicz is a very good piece of work, as reflected by the number of articles it contains. Four articles have been published in peer-reviewed journals, mainly in the first quartile in the field (i.e., *International Journal of Bilingualism*, *Brain Sciences*, *Brain and Language*, and *Frontiers in Psychology*). It clearly shows that the candidate has the ability to disseminate his results to the scientific community. It is worth noting that one of the articles is a single-author review paper, which reflects that the candidate has excellent knowledge of the topic and the related literature and that he has the required skills to synthesise information and discuss it within current theoretical frameworks.

The thesis also involves experimental complexity since both behavioural and electrophysiological methods were used. The design, data collection and analyses of electrophysiological data require time and expertise that the candidate seems to have successfully acquired during his training. Moreover, the data analysis employed various statistical tests, which reflects that Mr Naranowicz has sufficient experimental and statistical knowledge to design appropriate experiments to tackle the research questions. Finally, the studies involved monolingual and bilingual participants, which makes the recruitment of participants quite complex.

It is also important to underline that Mr Naranowicz shows awareness of the importance of transparency in science and has made a constant effort to conduct his research following the guidelines of 'Open Science'. For instance, he has made R scripts and raw data files available in the Open Science Framework, and he has also addressed the issues of replication in science and publication biases.

Finally, both in the articles as well as in the Discussion of the thesis, Mr Naranowicz makes an excellent interpretation of his results and clearly contrasts them with previous studies.

Critical comments and advice for future research

Here I detail a few comments that I will be interested in discussing with the candidate. They are minor and most of them require a simple clarification or further explanation of points that are already covered in the thesis. I also provide some advice for future research.

Critical comments

1- The thesis is based on previous literature in L1 that has shown that mood affects language processing. Although the candidate clearly reports previous findings, the mechanisms underlying this effect is not clearly explained (and it may not be either in the original articles). It would be interesting to describe these mechanisms in more depth (if possible) to better understand why the influence of mood should be different in L2 than in L1.

Following up on this comment, it should be better explained (even though briefly), especially in relation with article 1, why women are more affected by mood than men, at least in L1.

2- Article 1, materials. The norming study included 51 females and 8 males. Given that gender is affected by mood, it may have influenced the selection of the materials and the results.

3- In article 1, were the results analysed in relation with the different questionnaires (e.g., empathy)?

4- Although I understand the candidate (and the authors) may not have a clear idea, the absence of language interaction in article 3 should be further discussed. I am not sure I totally understand the explanation based on the level of meaningfulness between sentences in article 2 and article 3. Another difference between the two experiments is that one used a within-subject design while the other used a between-subject one. Hence, participants were set either in a bilingual mode or a monolingual mode, which may have influenced the way they processed sentences.

Advice for future research

[Comment that arose after the reading of article 1]. Try to limit the number of research questions. In this article, although the main question was about language and mood, the factor gender was extensively discussed although it was meant to be a secondary question. Same comments in relation to the number of variables in analyses. Having many variables in the same statistical test may reduce power.

In general, provide results of statistical tests to confirm the absence/presence of differences in participants' sociolinguistic and biographical data (e.g., either between two participant groups in

a between-subject design or between participants' two languages in a within-subject design), as well as in materials in L1 and L2 (e.g., article 2, table 3).

Article 1, materials. I understand from Table 3 that emotional and neutral words were originally selected from a database. It should be stated in the main text and the ranges used for each category should be given as well.

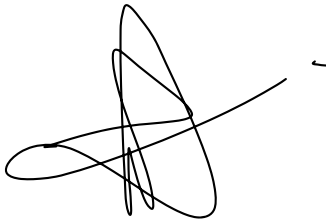
In general, power analyses should be run and reported to estimate the sample size of the studies.

In general, provide all the results, even if non-significant, especially for the effects/interactions of interest.

In conclusion, I believe Mr Naranowicz's thesis makes a very nice contribution to the field, and the candidate has acquired the skills required to carry on a scientific career as an independent researcher. I express a favourable opinion on the defence of this work.

Sincerely,

Alice Foucart

A handwritten signature in black ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.