RE: Short query about word norms in Shebani & Pulvermüller (2013)

Friedemann Pulvermuller <friedemann.pulvermuller@fu-berlin.de>

Tue 2019-04-30 10:19 PM

To: Montero-Melis, Guillermo <Guillermo.MonteroMelis@mpi.nl>;

Cc: manne.bylund@biling.su.se <manne.bylund@biling.su.se>; 'Zubaida Shebani' <zubaida.shebani@uaeu.ac.ae>;

Dear Guillermo,

Thanks for your email and your careful work and thinking! My brief answers are below.

Best regards,

Friedemann

From: Montero-Melis, Guillermo [mailto:Guillermo.MonteroMelis@mpi.nl]
Sent: Tuesday, April 30, 2019 8:00 PM
To: Friedemann Pulvermuller <friedemann.pulvermuller@fu-berlin.de>
Cc: manne.bylund@biling.su.se; 'Zubaida Shebani' <zubaida.shebani@uaeu.ac.ae>
Subject: Re: Short query about word norms in Shebani & Pulvermüller (2013)

Dear Prof. Pulvermüller,

May I follow up with some questions on your reported stimuli norms after looking in more detail into the studies you kindly shared with us (and some additional ones from your team)?

As I wrote in my last email, for our planned replication we wish to match our Swedish stimuli (arm-related and leg-related verbs) along the same variables you matched yours (cf. Shebani & Pulvermüller, 2013 [SP], p.225, Table 1). What motivates the questions below is that we would like to make sure we capture all relevant variables, while avoiding collecting redundant data.

1)
Imageability and *Visual relatedness* seem to be very similar. In fact, we haven't found a study from your lab where you report both measures independently (except in SP). E.g., in Hauk and Pulvermüller (2004, Hum Bra Mapp) you report "imageability" but not "visual relatedness", whereas in Pulvermüller et al. (1999, Cereb Cort) you report "visual" but not "imageability" ratings.
It would seem that these are very similar constructs. My guess is that you had different norms for the same stimuli collected from different studies (e.g., the two I just mentioned), and you reported both in SP? Now, for us it would perhaps be sufficient to collect one of these ratings, e.g. "imageability" following the guidelines in Hauk and Pulvermüller (2004)? Or is there a meaningful theoretical difference between the two that makes both necessary? If so, what is the difference and how can it be captured by ratings?

- You are right, we did not publish the full set of data although we obtained both imageability and semantic visual relatedness ratings in most cases. The correlation between the two is in the order of r=.9, so matching one of them seems sufficient indeed.

2)

Body relatedness is not reported in Hauk and Pulvermüller (2004). In fact, we haven't found a study where you explicitly report body relatedness. In Hauk and Pulvermüller (2004), you report how related the verbs are to different body parts (arms, legs, head), which of course could yield some kind of aggregate measure of body relatedness. However, in SP you report arm/leg relatedness *and* body relatedness separately; so these must be different ratings?
In any case, I wonder if body relatedness is a crucial variable when comparing action verbs that are performed with the body anyway? If you think it is, and we should control for it, could you please point us towards a study that reports how these ratings were collected?

- I agree that this is not absolutely necessary. This was aimed at obtaining a measure of somatosensory semantic information.

3)
Action relatedness is reported in Pulvermüller et al. (1999, p.498), but not in e.g. Hauk and Pulvermüller (2004). In Pulvermüller et al. (1999), you report asking "whether words reminded subjects of activities they could perform themselves (action ratings)" (p.498).
I have a similar feeling about this variable as about body relatedness: In the context of action verbs that can be performed with the legs and arms, the scale is perhaps not very informative? (To be sure, it is of course highly relevant if you want to oppose *visual* and *action* ratings, as was the case in Pulvermüller et al., 1999.)

- We are talking about general action-relatedness here, which we included in the ratings to have a general estimate of how strongly the particular word meanings relate to any kind of action (with the idea that the action word subtypes should be matched for this variable). I agree that also this variable can be omitted (as a similar estimate can be deduced from the three action subratings).

I hope you can provide us with some guidance on the issues above.

Kind regards,
Guillermo

From: Friedemann Pulvermuller <friedemann.pulvermuller@fu-berlin.de>
Sent: Monday, April 15, 2019 12:34 PM
To: Montero-Melis, Guillermo
Cc: manne.bylund@biling.su.se; 'Zubaida Shebani'
Subject: RE: Short query about word norms in Shebani & Pulvermüller (2013)

Dear Dr Montero-Melis,

Thanks for making us aware of another piece of lacking information in the 2013 paper. Apologies for that. The stimuli were selected from a lexical database at Cambridge, which we had previously been evaluated extensively. The standard psycholinguistic variables were taken from the CELEX database (Baayen, H., Piepenbrock, R., & van Rijn, H. (1993). *The CELEX lexical database (CD-Rom)*. University of Pennsylvania, PA: Linguistic Data Consortium.) and the semantic rating methods were described in, and laid the ground for, a range of previous imaging studies (in particular: Hauk, O., & Pulvermüller, F. (2004). Neurophysiological distinction of action words in the fronto-central cortex. *Human Brain Mapping, 21*(3), 191-201, which includes detailed methods descriptions and lists relevant questionnaire questions, but see also: Pulvermüller, F., & Hauk, O. (2006). Category-specific processing of color and form words in left fronto-temporal cortex. *Cerebral Cortex, 16*(8), 1193-1201. Pulvermüller, F., Lutzenberger, W., & Preissl, H. (1999). Nouns and verbs in the intact brain: evidence from event-related potentials and high-frequency cortical responses. *Cerebral Cortex,*

9, 498-508 - and a long series of similar papers up to Dreyer, F. R., & Pulvermüller, F. (2018). Abstract semantics in the motor system? - An event-related fMRI study on passive reading of semantic word categories carrying abstract emotional and mental meaning. *Cortex, 100*, 52-70. doi: 10.1016/j.cortex.2017.10.021). I checked the early versions of the 2013 ms with Zubaida Shebani and found that reference to some of the earlier publications describing the semantic rating methods had been included there. Why they disappeared in later versions of that ms, I can only speculate about – probably, we tried to squeeze the paper into a short publication format thereby omitting some of the details and citations.

I attach two relevant papers, the one by Hauk from 2004, which reports the rating methods actually used in the 2013 study, and a more recent one. In more recent studies, the questions were modified to explicitly center on the "semantic relationship" between lexical item and actions, objects, object features or internal states.

I very much hope that this information will be useful. Please let us know in case there will be more questions not answered by the 2013 paper.

Maybe I can add one more thing: The most difficult part of this type of study is to find a speed for the drumming exercise that is sufficiently challenging for the subject and still allows her or him to maintain a constant rhythm during the interference tasks. Zubaida Shebani will likely be able to give you further hints in case this does not succeed when first trying.

Kind regards,

Friedemann Pulvermüller

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From: Montero-Melis, Guillermo [mailto:Guillermo.MonteroMelis@mpi.nl]
Sent: Friday, April 12, 2019 5:53 PM
To: Zubaida Shebani <zubaida.shebani@uaeu.ac.ae>; friedemann.pulvermuller@fu-berlin.de
Cc: manne.bylund@biling.su.se
Subject: Short query about word norms in Shebani & Pulvermüller (2013)

Dear Dr Shebani and Prof Pulvermüller,
I hope this finds you well.

I contacted you last year with some questions about your 2013 paper in Cortex (Shebani, Z., & Pulvermüller, F. (2013). Moving the hands and feet specifically impairs working memory for arm- and leg-related action words. Cortex, 49(1), 222–231. https://doi.org/10.1016/j.cortex.2011.10.005), which you very kindly answered. As I told you back then, we are planning a (pre-registered) replication and extension of your study, including second language speakers.

I now have a further question, which I hope will be fairly straightforward to answer:
Do you recall from which source(s) you obtained the different variables reported in Table 1 (p.225) of your paper? I don't think this is reported in the paper. In particular, we can easily find English norms for valence and arousal (e.g., Warriner et al., 2013, Behav Res Meth) and imageability (e.g., Bird et al., 2001, Behav Res Meth). However, it is less clear to us which data you are reporting for visual relatedness, body relatedness, and action relatedness. Would you mind clarifying this?

We will run the study in Swedish and will probably need to collect our own norms. To do this, we would need to check the methods used to collect the English ratings, hence the need for the sources you consulted.

I hope you can help us with this.

Kind regards,
Guillermo

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