

This study investigates the approach-avoidance tendencies toward pictograms of physical activity or sedentary behaviours. This very substantial work explores these conducts and their evolutions according to the ages and the lifestyles of the participants.

To do so, and this is a strong point, the authors collected and analysed using mixed-effects models the reaction times as well as the participant's failed trials. Participants (n=130, [21:77] years old) were categorized in three age classes: younger, middle-aged and older adults. They self-reported the level of their physical activity lifestyle and their intention to be active. Their Body Mass Index was also filled in.

The results highlighted faster reaction times coupled with fewer failed trials in approach behaviours compared to avoidance tendencies toward physical activity stimuli before 45 years old. For participants over 45 years old, the authors reported faster reaction times when performed avoiding behaviors compared to approach behaviors toward sedentary stimuli. This result suggested a tendency to approach physical activity stimuli in younger and to avoid sedentary stimuli in older adults. To go further, the authors revealed through exploratory analyses that these tendencies toward physical activity were strongly associated with explicit physically active behaviors. At the opposite, no significant association with the intention to be physically active were highlighted.

First of all, this study appears to me well conducted without ethics or scientific misconducts nor conflicts of interest. Overall, the study tends to meet all the necessary excellence criteria. Nevertheless, I could raise the following few questions and clarifications.

In the "Automatic Approach-Avoidance Tendency" during the Introduction section, the pioneer works of Lang that dealt with Approach-Avoidance Tendency depending on emotional, attentional, and motivational contexts appears to be missing to me. This perceptual context would appear to me all the more important as it could be useful during the discussion / limit section (see later, the last suggestion of the review). The authors took into account the "Explicit Attitudes and Intentions", but what about affective and motivational perceptions linked to the practice of a physical activity? It is a part of human behaviors related to physical activity practices that seemed to me a little bit neglected, at least in the introduction and discussion or limits sections.

I underline here again the clarity of the hypotheses and the pre-registration process of the study which contributes to give this work a great general robustness.

My strongest request for precision comes now and concerns the method section. Even by re-reading several times and with several round trips through the paragraphs and the sections, it is still difficult for me to really reproduce with no doubt the motor task required by the participant in order to respond to the stimuli and achieve the motor behavior of approach or avoidance:

- "The participant sitting in front of the computer is instructed to use the "U" key to move the avatar up or the "N" key to move the avatar down" but what is the initial position, and in particular the initial position of the hand(s) required in the initial posture? (During the fixation cross and avatar period?)
- Was it clear to the participant to use only one hand? Was the pointing finger placed above the "J" key or "H" key in the initial position? or elsewhere? Is the hand movement (in the physical world) always congruent with the avatar movement (in the virtual world)? (or should the hand approach the screen to press the n key, and therefore approach the pictogram, to trigger an avoidance behavior of the avatar?)
- What exactly does "reaction time" represent in this study? How exactly is this duration determined in this study: between which starting event (I supposed the visual stimulus

appearance) and which ending event (Is this the moment when the participant releases a button that was pressed in the starting position? or when the candidate presses the U or N key?)

- In some Motor Control studies, the reaction time is the duration between a sensorial stimulus and the beginning of the movement that allows the answer task. In such a case, reaction time is different from the Movement Time and the answer time is the addition of the reaction time plus the movement time.
- However, in other psychology studies, reaction time is a parameter that includes the duration of the answer planification and the duration of the answer execution, even if it is a motor answer. In this case, "Reaction Time" encompasses the movement time.
- Ultimately, I think that more precision on this parameter will be very useful for the readers.
- Finally, about the physical motor response itself, it seems to be no SOA between the start of avatar appearance and the visual stimulus input (always 1000 ms duration): how to be sure that anticipatory motor response strategies do not emerge in connection with this rhythm, and which could interact with the measured avoidance approach behaviors?

The scoring and statistics work is very substantial, and performed using linear and logistic mixed-effect models. To be fully honest, it was also necessary for me, as I imagine several other readers to come, to re-read the previous statistical methodological work of some of these authors in order to be able to assess and better look the statistical rigor of this work.

Three age classes are carried out. Younger [21-39] years old, Middle age [40-59] and older adults [60-77]. With regard to this classification, how and why is there a threshold of difference in behavior at 45, i.e. within a age class? ("Our results show faster reaction times and fewer errors when approaching compared to avoiding physical activity stimuli before 45 years of age.") This raises the question of the method of segmentation of age classes a priori and why not again a posteriori when reading the results?

Finally, the authors report an absence of evidence that could plead in favor of an association between automatic attitudes and intentions to be physically active. The intention to be physically active refers to the levers (and brakes) of the physical practice, as well as to the motivations to practice which can vary, in particular with age. In the category of the youngest adults, physical practice could be the result of intrinsic motivation and sources of own pleasure (positive affect, arousal, with high intensity). Conversely, in older adults, motivation could have an extrinsic tendency to respond to recommendations and societal values which could be external of the individual. As such, it could have been useful to collect the subjective evaluation of the affective context that the pictograms engendered in each participant for example by means of a Self-Assessment Manikin. Thus, the subjective measures of affect, arousal and intensity could have been added as regressors to the different models. In this case, perhaps that this perspective could be discussed, mentioned in limit, or why not appear in perspective of further study?