

Many studies to date have shown that cognitive functions deteriorate with age. This applies in particular to memory, executive functions, and the speed of information processing. However, the subject of changes in the processing of information about oneself in the elderly population has received much less attention so far, and in particular, there is little data on the influence of age on the activity of the brain when processing such information. The current project aims to fill this gap.

The goals of this project are twofold. The first goal is to examine the plasticity of the self-representation in the group of older people, i.e. the ability to include in the self-concept new, abstract information (e.g. abstract shapes) arbitrarily assigned to oneself. The incorporation of new abstract information into the self-concept will be demonstrated by both behavioral (e.g. shorter reaction times) and neural measures (e.g. increased brain activity), indicating the self-preference, i.e. prioritized processing of such new information associated with the self over similar information associated with other people. Moreover, the lack of significant differences between younger and older participants will indicate a similar plasticity of the self-representation in both age groups.

The second goal, in turn, is to investigate age-related changes in the preferential processing of well-known and well-preserved information referring to the physical and psychological aspects of the self. In research on the physical aspects of self, usually pictures of the face are used, while in research on the psychological aspects of self – adjectives describing personality traits. Therefore, in this research line, photos of the participants' faces and photos of other faces, both known and unknown, and adjectives-character traits (assessed in terms of their matching to the description of oneself and other people) will be presented. For age-related changes in the preferential processing of different types of well-established and well-known self-related information, the strength of this preference will be operationalized as the difference in behavioral and neural measures between the self condition and other conditions. This effect will be directly compared in both age groups.

In conclusion, the preferential processing of information about the self in the older adults and in the control group of young adults will be tested both in terms of newly acquired and well-established information referring to the self. The current project will also take into account factors that may have a certain impact on the studied effects: a decrease in the level of self-esteem and an increase in the level of loneliness in the elderly population. It is worth noting that the influence of both factors on the processing of information about the self was evidenced in studies with young participants. Therefore, the levels of self-esteem and loneliness in the group of younger and older participants will be examined. These subjective measures will be incorporated into behavioral and neural data analyses.

The analyses of electrophysiological data will be carried out with the use of various methods (event-related potentials, permutation tests, analysis of the similarity of representations, source localization of recorded brain activity). In this way, the results obtained in one type of analysis will be confronted with the results obtained with other methods, strengthening (or undermining) the conclusions drawn from the initial analysis.

The current project has a chance to significantly expand our current – rather limited – knowledge about the influence of age on the patterns of brain activity associated with the processing of information about the self and others.