The term ‘self’ is often used to discuss multiple different cognitive phenomena, and can thus be difficult to be operationalized. In the field of cognitive and social neuroscience, the topic of the self is addressed by investigations of self-referential processing. Own face, body or name are stimuli related directly to self-representation but self-referential processing also includes the processes of self-mentalizing and self-reflection. Self-related stimuli are memorized better than stimuli related to other people (so-called self-reference effect in memory) and they are preferentially processed. One of the examples of such self-preference is the widely recognized cocktail party effect – the ability to automatically notice the self-name in the noisy environment.

The self-preference can be measured experimentally. It may be reflected in faster reaction times and higher brain activity associated with the processing of self-related stimuli. For instance, faster and more accurate responses were recorded for one’s own face than for other faces, either familiar or not. Hearing or seeing one’s own name, as well as seeing self-face is often associated with an enhanced brain activity, as revealed by increased amplitudes of P300 – a late positive component of event-related potentials that occurs around 300 ms after the stimulus onset, with its maximum over central-parietal scalp sites.

An interesting research question is whether such self-preference is driven mainly by the extremely high familiarity of any self-related information or by the emotional load/significance of such information. The aim of this project is to investigate the plausible role of each of these factors independently by substantially minimizing or even eliminating the involvement of the other one. In order to disentangle the role of those two factors, two experiments with EEG recording will be carried out. Afterwards, EEG data will be analyzed using event-related potential methods and P300 will be in the focus of our attention.

In the first one, the familiarity factors will be equalized for the self and another person conditions but the emotional significance of the two will differ. Specifically, the impact of the emotional aspects on the self-referential processing will be investigated by comparing ‘new names’, arbitrary chosen just before the experimental session and subsequently linked to the self and a personally known, but not significant person (e.g. a neighbor, a person from a fitness club). Therefore, the self and the other person condition will differ only in respect of their emotional relevance. If the emotional load of self-related information is the major factor driving the prioritized self-referential processing, the newly acquired information referring to the self and the newly acquired information referring to another person will be associated with dissimilar brain responses, with enhanced P300 for the self. Similar brain responses in the self and other person conditions, in turn, will indicate that emotional load is not the major factor driving preferential processing of the self.

In the other experiment, a direct comparison of the self-face vs. emotional faces will reveal the impact of familiarity on the self-preference, with the self-face being highly familiar and emotional faces being unfamiliar. If the familiarity factor is crucial in the preferential processing of self-related information, the unknown emotional stimuli and the self-related stimuli (i.e. both types of stimuli being emotional but their levels of familiarity differ) will be associated with dissimilar brain responses, with higher P300 amplitudes in the self condition. Otherwise, similar ERP responses will prove that the impact of familiarity is not critical.

Numerous previous studies focused on the issue of familiarity by comparing brain responses to the self-related stimuli vs. stimuli referring to other people (members of family, famous people, unknown people). However, differences between experimental conditions were not restricted to different levels of familiarity, they might be also driven by differences in emotional significance of the self vs. other person related information. However, the emotional aspect of self-referential processing has been so far rather neglected. Therefore, the aim of the current project is to fill this gap and to provide evidence of the role of the emotional relevance as well as the familiarity factor in prioritized processing of self-related information.