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"Mine is more important!" - using dynamic stimuli to determine neural effects of ownership

Can you remember a situation of yourself looking at pictures from past years, and suddenly, when you saw your face among other people you immediately noticed: "Oh, this is me!"? Maybe some other time, during a party, while talking to your friends or listening to music, a conversation taking place in another part of the room grasped your attention instantly only because someone briefly mentioned your name? Psychologists called this phenomenon the *cocktail party effect*. These automatic reactions are a good example of preferential processing of certain type of information. The information concerning ourselves reach our attention faster and easier. This effect is called *self-preference* and designates the automatic ability of our brain to search and recognize in the surroundings every stimulus related to our own person.

The same can happen in the case of items that we own. The picture of your own house, car or even the favorite tea cup will evoke an immediate and automatic reaction. The so-called *endowment effect*, known well in psychology, implies the tendency to evaluate owned objects more positively than others. We tend to focus on these objects unconsciously, even when our attention is directed to something completely else at the moment. Therefore, a special neural network was identified as responsible for directing our attention to the stimuli related to ourselves.

According to the literature, the *self-attention network* (SAN) controls the reactions to stimuli related to our identity and directly influences attention to focus on them. However, the recent studies regarding the theory of *extended self* indicate, that not only the image of one's own face or the sound of one's own name is necessary to identify oneself with the stimuli. An image of a closely-related person or even imaginary shapes that were supposed to be associated with one's own person may generate the same brain activity. In this project I aim to investigate, whether the objects of everyday life can be included in the concept of our extended *Self*. To what extent do we identify ourselves with our own car or the wristwatch?

The research proposed in this project aims to investigate the specifics of SAN functions, especially its core elements: ventro-medial prefrontal cortex (vmPFC) and the posterior superior temporal sulcus (pSTS). These structures play the most important role in directing attention to the stimuli related to the *self*. In this proposal, I want to check whether the same structures will be activated in response to the objects belonging to oneself, according to the theory of the *extended-self*. In order to verify this hypothesis, I will use brain imaging method of functional magnetic resonance. The participants of the study will evaluate movies presenting faces, buildings, vehicles and other objects, among which some items will belong to them. It is a difficult challenge, because the experimental design requires to build a separate database for each and every person taking part in the study.

The advanced methods of data analysis will allow me to decode the neural activity pattern of ownership. What is more, the procedure of functional images alignment across all the participants (*hyperalingment*) will finally answer the question (1) if the hypothesis of the *extended self* has a common neural background and names and images of one's own face elicit the same activity as items belonging to the person; (2) to what extend does the activity pattern for "own" items is stable over the group of participants and is it possible to find the neural code for "ownership"?

This project will be realized in partnership with the Center for Cognitive Neuroscience at Dartmouth College, Hanover, New Hampshire, USA.