Everyone knows how important a healthy diet is for one's well-being as well as for disease prevention. Eating brings pleasant taste experiences, and so it becomes utterly difficult to resist food-related temptations. A healthy diet requires self-control of impulses, that is suppressing automatic responses to temptations and using one's reason when choosing food items. On the other hand, choices between healthier and tastier food items, as well as decisions concerning the amount of food consumed, are usually made without paying enough attention – our working memory is then loaded with thousands of things to do. And self-control requires cognitive resources to inhibit impulses and focus attention on the choice. Thus, it is so difficult to restrain from snacking on while watching TV or playing cards, or trying another delicacy at a wedding reception.

The aim of the project is to explain the role of cognitive resources for self-control of impulses in food choice. The reasons behind taking up the subject are the research findings showing that increased working memory load when making decisions may both decrease and improve self-control in food choice. So far, individual characteristics, experimental circumstances or neural processes enabling those opposite effects have not been examined. Available findings suggest that cognitive resources in working memory are activated when paying attention not only to healthy outcomes of food choices but also to food hedonic qualities (taste). Is it possible, then, that reducing cognitive resources in working memory will distract our attention from the taste of chocolates so that we are able to resist eating them? Under what circumstances and for whom would it be possible? Other studies indicate, on the other hand, the significance of cognitive resources in inhibiting impulses and show that the better focus of attention on healthy aspects of food is possible after performing a task that requires inhibition of automatic responses. In other words, being attentive when performing a non-food-related task (e.g. naming the font colour of the following: green, red, green, blue, red, etc.) may be transferred to the food choice made immediately after this task. So, is improved self-control of impulses in food choice possible through triggering 'attentiveness' when performing a different task that requires inhibition of impulses?

In the project, in a series of questionnaire, behavioural and neuroimaging experiments, we will investigate:
1. Individual characteristics, experimental circumstances and neural mechanisms upon which reducing cognitive resource availability in working memory leads to deteriorated self-control,
2. Whether and how prior activation of cognitive resources through a different task that requires automatic reaction inhibition may improve self-control of impulses,
3. Automatic processes in self-control upon the above-mentioned experimental manipulations.

The first stage of the project will comprise questionnaires and psychological tests in which we will assess impulsiveness, sensitivity to taste in food consumption, trait self-control and the tendency to avoid cognitive effort.

In the second stage, we will conduct two behavioural experiments to examine how the following manipulations affect self-control in food choice: (1) reducing cognitive resources in working memory, i.e. working memory load or visual distractors (attractive photos), (2) 'control readiness' i.e. previously performed task that required inhibition of automatic reactions (e.g. naming font colours). Working memory load will be achieved by asking the participants to memorise a complex pattern of dots on the computer screen. We will also investigate how experimental circumstances (the way of presenting a food choice) as well as individual characteristics (sensitivity to taste) influence the above-mentioned effects.

The next stage of the project will comprise two neuroimaging experiments in which the participants' brains will be scanned while making a food choice and at the same time performing other tasks (with the above-mentioned experimental manipulations). It will allow us to reveal and understand the neural processes underlying the observed effects. We will also make high-quality images of the brain structure of the participants, which will be helpful to determine the relation between grey matter volume in brain regions, individual characteristics and self-control observed in the experiments.

The project will contribute to understanding why self-control mechanisms often fail and why people make impulsive choices. It seems likely that the project findings will be applied in the future to draw up new, more effective strategies or behavioural interventions improving self-control of impulses in eating. It will help to fight the overweight problem, prevent obesity and other civilisation-related diseases, i.e. hypertension, diabetes or cancer.