Transferability of incidental chunk learning effects

When we go to a grocery store to buy just a bottle of milk and a bag of cereal we do not need to write down what we are intending to buy since we can easily keep such a short shopping list in our memory. However, if we were to buy more products, we would probably need to use a piece of paper or a smartphone to note down the products we should buy so that we would not forget to actually buy them. Although the longer the shopping list, the harder it is to keep it in mind intact, there are some ways to organize information in memory that allow us to memorize more items than we would normally be capable of. Let's say that one wants to buy ground beef, pasta, tomato sauce, onion, garlic, oregano and olive oil. In such case one can simply remember to buy spaghetti ingredients. Provided that one is familiar with a spaghetti recipe, in this way all the needed items can be easily retrieved from memory just by recalling how this dish is prepared. On the other hand, one can also try to create an acronym that contains the first letters of the shopping list items. This allows for actively holding in memory just one instead of several words (e.g. an acronym KITCHEN denoting list consisting of Ketchup, Ice-cream, Tomato, Cheese, Ham, Eggs and Nuts). In such case, if some additional information should be maintained in immediate memory, like the precise amount of cash in one's wallet or the location of one's car in the car park, then the task of maintaining all the needed information should be much easier when the shopping list is abbreviated into a single word.

A cognitive strategy of maintaining large groups of information as single objects for immediate use is called *chunking*. For example, the label "spaghetti ingredients" and the acronym "KITCHEN" can be thought of as chunks comprised of specific to-be-bought items. The aim of this project is to explore how new memory chunks can be established in our memory, and how those newly established chunks can be used to aid performance in cognitive tasks. Importantly, the novel contribution of this project lies in the way in which chunks will be established. The proposed studies will investigate when and how chunks can be created not through intentional learning – as in the vast majority of studies to date – but incidentally, by using to-be-chunked information in cognitive tasks. Furthermore, and most importantly, it will be tested whether chunks created in such fashion can be used outside of the task in which they were learned. If that is possible, it would mean than the utility of chunks might be greater than initially assumed. Two ways in which chunks can influence memory tasks will be investigated. First, chunks' potential for restoring lost information to immediate memory (i.e. assistance in *redintegration* of information) will be examined – that is, whether the word KITCHEN helps buy all the necessary items rather than forget some of them, reducing the need for going shopping again. Second, it will be tested whether chunks help to hold additional information in immediate memory (i.e. whether they help through *compression* of information) – that is, whether remembering the word KITCHEN instead of a list of seven ingredients makes it easier to remember that one also has to collect a parcel from the post office and refuel the car on the way home.

For that purpose, a series of experiments in which new memory chunks will be established will be conducted, and different memory tasks testing such chunks' usefulness in various conditions will be introduced. This will improve our understanding of circumstances in which we can use tools developed to facilitate performance in one kind of a memory task and apply them to different tasks as well. In other words, the conducted experiments will aim at answering the question of whether the effects of unintentional chunk learning can be transferred between different cognitive tasks, benefitting performance not only in the task in which they were created, but also in other tasks that require input from memory.