

# Applying the SORKC-model to the analysis and modification of energy consumption behavior

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In order to reach the aim of increasing the energy efficiency by 20 % until 2020, several strategies are pursued. Efforts are taken to reduce energy consumption or shift it in time. These goals can be approached by technical means like efficient electrical devices or the external control of the consumption. One approach is the installation of smart meters in private households. The information processed by smart meters allows for a detailed analysis of energy generating and consumption devices. It can be visualized by in-home displays. However, neither the question whether the consumer accepts the technology nor how efficient stand-alone technical activities will be can be easily answered. One can estimate energy savings possible with the implementation of smart meters but it is quite unclear how persistent such effects are. Thus there is a need for approaches that allow the modification of the consumers' behavior. In an interdisciplinary project several approaches in saving energy were elaborated. By reviewing different theoretical approaches to influence behavior we came to the conclusion that choosing a behavioral approach would be most promising. This approach includes a detailed behavior analysis that has to be conducted in order to understand the interrelations leading to a specific behavior. The analysis is conducted according to a modified version of the SORKC-model. The first step includes the identification of a behavior that is to be modified. Then the components of the model have to be analyzed in order to develop the model for the behavior of interest. The components are: the stimuli (S) eliciting a specific behavior (reaction, R) and the consequences of the behavior (C), the status of the organism (O) as well as the contingencies and contiguity (K), both of

which moderate the relationships between S, R and C. In order to modify behavior one has to identify the components that can be modified. Obviously the SORKC-model describes only a very simplistic situation. In the field where a complex situation and discriminative stimuli as well as the effects of competing stimuli and behaviors have to be considered modeling an actual behavior requires a quite complicated representation. To exemplify the approach we analyzed a number of energy wasting behaviors (e. g. starting the dishwasher even though it is not filled completely) and deduced possible strategies of modifying the target behavior. Taken the increase of the proportion of renewable energies into account energy producers have an interest in shifting energy consumption in time. In order to find out which energy consuming behaviors are flexible a questionnaire study was conducted. The participants living in student households gave data for each day of one week, indicating which energy consuming behaviors they conducted and whether they see the possibility to reduce or shift these behaviors. Results show that the participants of this sample display a pattern of energy saving behaviors. Thus there appears to be only a potential for shifting behavior patterns in time. Since it can be expected that the different social groups of strata will show large differences in energy consuming behavior patterns and flexibility, the acceptance of alternative behavior strategies and for behavior shifts will be examined in other types of households. Despite the enhanced effort that has to be taken by using detailed analyses of behavior the SORKC-model-based approach shows to be a very fruitful strategy to deduce workable strategies for behavior modification.