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Summary

There is a rapidly growing literature on construction and application of lifestyle-based segmentations in the sustainability research. The motivation is an increasing awareness that interventions tailored to a specific target group are more effective than one-size-fits all interventions and lifestyle-based segmentation approaches could be a useful concept for defining those target groups. In this report we present a framework for sustainability-related lifestyles based on both reported behaviour and attitudinal factors and describe the reasoning for the selection of individual constructs. Sustainability is a very broad concept and may include a broad range of fields of actions, but in this study the focus lies on energy and resource consumption as this is one of the main impact targets in the SWICE project.

On the one hand, we avoid developing a completely generalist lifestyle-based segmentation in order to provide more scope for applicability in the field of sustainability research. On the other hand, we focus our approach on sustainable living and working, which is the overall topic of SWICE and gives the framework a slight generalist character, since it includes a large range of behaviors and psycho-social determinants.

1 Introduction

There is a rapidly growing literature on construction and application of lifestyle-based segmentations[1] in the sustainability research. The motivation is an increasing awareness that interventions tailored to a specific target group are more effective than one-size-fits all interventions (e.g., Abrahamse et al. 2007; Elsharkawy and Rutherford 2015) and lifestyle-based segmentation approaches could be a useful concept for defining those target groups (Klöckner 2015). While generalist approaches, such as Otte's conduct of life typology (Otte 2004) or SINUS milieus (Barth et al. 2018), offer important advantages in terms of high replicability and applicability in a wide range of research fields, the domain-specific approaches have usually larger explanatory potential regarding specific behaviours and typically result in more meaningful target groups for interventions. In this contribution, we propose a middle way. On the one hand, we avoid developing a completely generalist lifestyle-based segmentation in order to provide more scope for applicability in the field of sustainability research. On the other hand, we focus our approach on the domain of sustainability, which is a very broad domain and gives the framework a slight generalist character. Another point, where the numerous lifestyle-based segmentation approaches largely differ is the question whether to include only attitudinal (e.g., attitudes, values, beliefs, etc.), only behvioural (e.g., reported behaviour) or both constructs. While Ohnmacht et al. (2009), Thøgersen (2017, 2018), and numerous other contributions include only attitudinal factors, Sütterlin et al. (2011) and Barr and Prillwitz (2012) include both constructs and Barr and Gilg (2006) include only reported behaviour. In addition, Prillwitz and Barr (2011) compare the lifestyle-based segmentation based on reported behaviour with segmentation based on attitudinal factors. Their findings reveal that most segments based on reported behaviour match the direct counterparts of the segmentation based on attitudinal factors. In this contribution, we follow Sütterlin et al. (2011) and Barr and Prillwitz (2012) and include reported behaviour as well as attitudinal factors. As it is the ultimate goal to tailor interventions to specific lifestyle groups, the groups must be characterised based on their behaviour and thus also providing information on their potential for behaviour change. We believe that those lifestyle groups are not static, and that people can change the group over time. Furthermore cluster characterisation may also change over long periods of time, depending on the contextual, infrastructural, normative and policy changes going on. In order to design, argue for and frame interventions tailored to a specific cluster, attitudinal factors are crucial as well.

Based on the considerations above, we developed a lifestyle-based segmentation framework visualized in Figure 1. It consists of a list of attitudinal factors and reported behaviours. The reasoning for the

[1] In the lifestyle research, there are several related, partly overlapping concepts, such as lifestyles, conducts of life or social milieus, without a broad consensus regarding their definitions. Since we do not focus in this report on this theoretical debate, we use for simplicity reasons the term "lifestyle-based segmentation" to jointly refer to all these concepts.

selection of attitudinal factors and reported behaviours presented in Figure 1 is described in the following two sections.

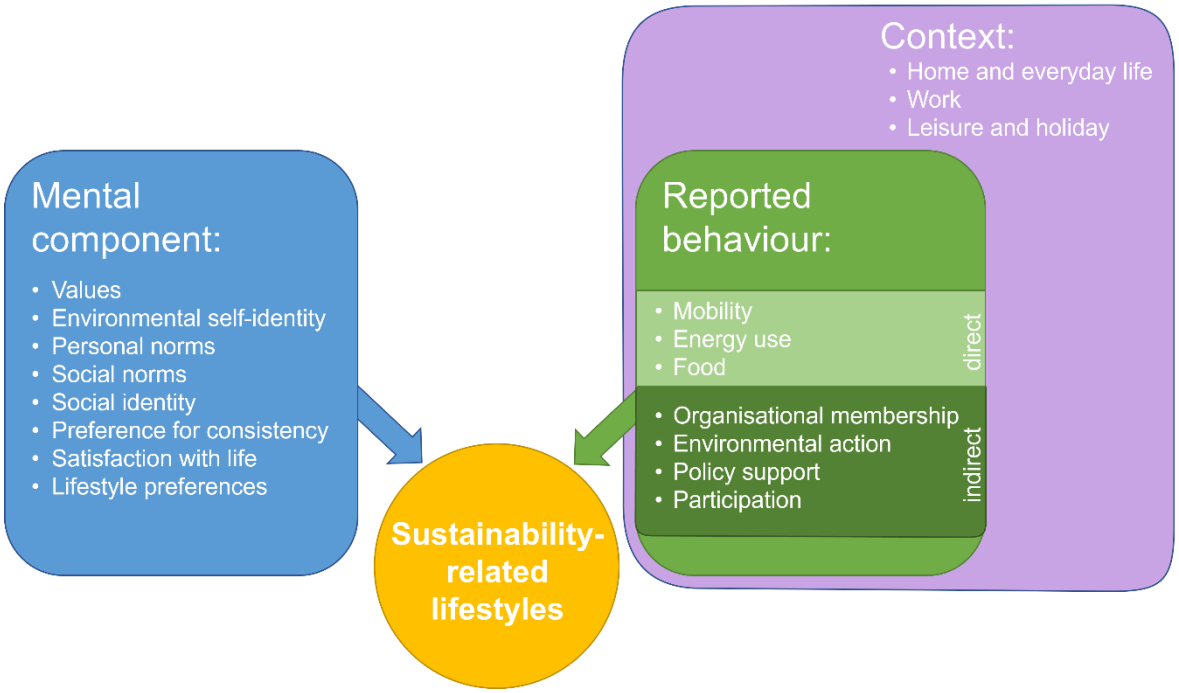

Figure 1: Lifestyle-based segmentation framework

2 Deliverable content

2.1 Attitudinal factors: Which constructs to include?

In addition to reported behaviour, our lifestyle-based segmentation includes a range of attitudinal factors, for which there is evidence in the literature that they play an important role for shaping pro-environmental behaviour. For example, biospheric **values** and **environmental self-identity** are found to be important determinants of environmental preferences, intentions and behaviour (van der Werff et al. 2013) and motivators for climate action (Bouman et al. 2021). In addition, according to the value-belief-norm theory (VBN, Stern 2000), values activate **personal norms**, defined as feelings of moral obligation to act in a certain way (e.g. pro-environmentally). And as stated by the norm activation model (NAM, Schwartz 1977) personal norms eventually affect behaviour. However, not only personal norms, but also **social norms**, be it descriptive (perception of what the group members do) or injunctive (perception of what the group members approve) has been found to have an influence on a range of climate-change-related behaviours (Cialdini and Jacobson 2021). An influence of social factors on pro-environmental behaviour can also operate through **social identity**, defined as perceived membership in a group or category of people (Tajfel 1982; Turner et al. 1987), which leads people to act in accordance with the relevant group's goals, values, beliefs, and behaviours (Prati et al. 2017). Social identity has been shown to have an influence on pro-environmental behaviour (Dresner et al. 2015; Gatersleben et al. 2014) and attitudes (Van der Werff et al. 2014). Furthermore, the effect of interventions to change behaviour based on social influence techniques, such as foot-in-the-door or persuasion, is found to be moderated by **preference for consistency** between attitudes and behaviour (Guadagno and Cialdini 2010). Subjective well-being or **satisfaction with life**, defined as individuals' cognitive and affective evaluations of their lives (Diener 2000; O'Neill et al. 2018; Steg and Gifford 2005) is also an attitudinal factor, for which there is evidence with regard to its impact on pro-environmental behaviour. In particular, it has been found that certain dimensions of subjective satisfaction with life, such as identity and status have an impact on sustainable transport behaviour (Cohen et al. 2013; Schubert et al. 2020; Steg and Gifford 2005) and sustainable consumption (Noppers et al. 2014). **Lifestyle preferences** is used as an umbrella term for preferences in different aspects such as simplicity, which impact a person's lifestyle. These preferences can be

influenced by the other attitudinal factors mentioned above (Choi and Feinberg 2021; Chouk and Mani 2019; Rich et al. 2020; Schubert et al. 2020; Thøgersen 2017, 2018).

2.2 Reported behaviour: Which domains to include?

Reported behaviours considered in our lifestyle-based segmentation framework include behaviours having direct as well as indirect influence on energy and resource consumption. Moreover, our selection of reported behaviours includes, to a different extent, three important behavioural contexts, namely home and everyday life, work, and leisure and holiday. **Mobility**, **energy use** and **food** are the three domains responsible for the largest share of the negative environmental impacts (Thøgersen 2017, 2018). **Organisational membership** in formal social groups, such as sports clubs, music groups, youth and senior citizen associations, neighbourhood associations, charity and environmental associations, foster sharing experiences and social learning (Moser et al. 2019). Membership in those groups can have a strong influence on various types of energy consumption behaviour (Frick et al. 2017). Formal social groups influence the behaviour of their members mainly through social norms, which are developed, shaped and changed over time in these groups (Frick et al. 2017; Moser et al. 2019). **Environmental action**, e.g. through grass-root organizing and citizen activism, has a large potential for achieving carbon emission reductions (Alisat and Riemer 2015; Roser-Renouf et al. 2014). This can happen either directly, through encouraging individual lifestyle changes, or indirectly, through putting pressure on economic and political actors to introduce measures which might induce carbon emission reductions (Fisher and Nasrin 2021). **Supporting and accepting pro-environmental policies** has a huge decarbonization potential, since large parts of the population are affected by those policies and possibly incentivised to change their environmentally-relevant behaviour (Sütterlin et al. 2011). In addition, policy support not only increases the likelihood that pro-environmental policy measures are going to be implemented, but also increases the effectiveness of those measures after their implementation (Kaiser et al. 2023). **Participation** is widely regarded as an important requirement for sustainable development (Musch and von Streit 2020). In particular, it has been acknowledged that successful sustainability transformations require the participation of both scientific and non-scientific actors (Musch and von Streit 2020). In addition, promoting public participation in environmental governance can contribute to mitigating local environmental problems (Wang et al. 2020).

3 Conclusion and Outlook

Through extensive literature research, we have diligently crafted a robust theoretical framework for lifestyle-based segmentation within the realm of sustainable living and working. In the process of selecting the factors and domains to incorporate, we judiciously strived to strike the perfect balance between comprehensiveness and feasibility. Our aim was to encompass the most pivotal constructs and domains relevant to sustainable lifestyles, while simultaneously focusing on implementability within the SWICE research project, specifically for integration within a comprehensive questionnaire.

We developed a first version of the questionnaire including all factors from the framework described above and conducted a survey with a representative sample provided by a private access panel (N=196). As a next step, we will apply the standard procedure of item reduction by factor analysis. Subsequently, we will build lifestyle segments based on a cluster analysis. The developed questionnaire, which covers a very broad range of attitudinal as well as behavioural factors will be made available to the whole SWICE consortium for their use. To support the use of the questionnaire also for researchers not working in the field of social sciences, the different factors will be described in a comprehensive way. Furthermore, it will be possible to use only parts or single questions of the survey depending on the focus of the study at hand. But even if only some questions are used in the different research projects, it is crucial that we all use the same formulation for measuring e.g., social norms, to enable comparison within different interventions tested in the Living Labs or any other experimental context.

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