Original research article

Informing a social practice theory framework with social-psychological factors for analyzing routinized energy consumption: A multivariate analysis of three practices

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ABSTRACT

A key factor contributing to the non-realization of energy efficiency potentials is the routinized way in which many energy consumption behaviors (ECBs) are performed. To analyze routinized ECBs, we draw on social practice theory and psychological concepts and suggest a framework that considers individual, social, and material factors. Based on our proposed framework and employing multivariate regression analysis, we gain new insights into associated factors of routinized ECBs—particularly for washing and drying clothes and showering. Analyzing data from a survey conducted among Swiss households in 2016 (n = 5015), we find that individual values, practice-specific wants, and materials explain variations in routinized ECB performance. Furthermore, socio-demographic predictors shed light on cultural and status differences associated with routinized ECBs. This paper contributes to understanding associated factors of routinized ECBs by bridging practice theory and psychology-based factors.

1. Introduction

Designing effective interventions to reduce household energy consumption requires an understanding of the explanatory factors of routinized energy consumption behaviors (ECBs). Gaining such insights is of paramount importance for at least three reasons. First, routinization might explain why energy consumption increases despite awareness and knowledge about how to save energy [1]. Second, a huge share of our behaviors are habitual. Wood et al. [2] found that 88% of hygiene and appearance behaviors are habits (i.e., performed frequently and in stable contexts). Third, a considerable carbon-saving potential is associated with habitual behavior changes. Dietz et al. [3] estimated an annual saving potential of 2.2 million metric tons of carbon after 10 years, if 35% of the U.S. population, that are not yet performing the behavior, were to line dry clothing.

Over the past few decades, our understanding of routinized ECBs has improved remarkably. Social practice theory (SPT) has informed many empirical studies on routinized behaviors, such as washing clothes [4,5], line drying [6], and showering [7]. A main finding was that routines evolve in an interplay of technology, social norms, and everyday life. These studies also considered historical narratives and technological developments [4], social relations [5], as well as

individual circumstances [7] that play a role in the performance of practices.

In a parallel research strand, few studies rooted in environmental and social psychology analyzed routinized behaviors. However, several analyzed psychological and socio-demographic predictors of curtailment behavior, comprising daily life ECBs [8]. Psychological predictors include concerns about energy security, personal and social norms, and environmental and financial motivation [8]. Socio-demographic predictors include age, gender, education, and income [8].

Although SPT and psychology scholars share an interest in understanding "repetitive climate-relevant actions" [9], the two perspectives are often presented as contrapositions [6,10]. The epistemological differences between SPT and theories of behavior are rooted in conflicting conceptualizations of the basis of action; in theories of behavior, the basis of action is individual choice, whereas in theories of practice, it is socially shared conventions [11]. Nevertheless, Kurz et al. [9] elaborated on how these approaches can benefit from one another: "the traditionally more individualistic approaches of social psychology can benefit [from considering] the material, procedural, and social structures that constitute [practices]" ([9], p. 123). In turn, SPT may engage with ideas from social psychology, which might offer useful conceptions "for both the theorizing and changing of the social meanings of

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practices" ([9], p. 124). We build on the suggestion by Kurz et al. [9] to analyze individual and structural factors of routinized ECBs.

SPT forms a heterogenous "family of theories" ([12], p. 244). However, most SPT approaches use practices as their smallest unit of analysis [12]. Reckwitz [12] described a practice as

> a routinized type of behavior which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, "things" and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge. A practice [e.g., a way of cooking] forms so to speak a "block" whose existence necessarily depends on the existence and specific interconnectedness of these elements, and which cannot be reduced to any of these single elements (p. 249–250).

Shove et al. [11] subsumed these features of practice into three categories: materials (infrastructures, tools, hardware), meanings (mental activities, emotions, motivational knowledge), and competences (know-how, background knowledge, general understandings, specific skills). Routinization is then understood as "ongoing accomplishments in which similar elements are repeatedly linked together in similar ways" (p. 24).

Within the SPT framework, a debate on the role of individual factors can be observed. In some SPT versions, people are seen as carriers of practice [11,12]; consequently, the profile and evolution of any practice depends "on changing populations of more and less faithful carriers or practitioners" ([11], p. 63). This view has been criticized by Piscicelli et al. [13] who stated that such SPT versions tend to overlook the role of the individual and its ability to negotiate conceptions of normality. This debate connects to the discussion on how the relationship between individuals and structures should be conceptualized. To overcome the agency-structure divide, Piscicelli et al. [14] suggested an individual-practice framework which acknowledges "the existing interaction between the carrier [i.e., the individual] and a specific configuration of 'material', 'competence' and 'meaning' elements" (p. 39). Similar concerns can be raised regarding the conceptual differentiation between practices-as-entity and practices-as-performance when analyzing variations within collectively shared practices. Practices-as-entity encompass socially embedded underpinnings of behavior, and practices-as-performances are the observable expressions (i.e., behaviors) of these social phenomena [15]. However, it is unclear in what way interaction and renegotiation between individuals and structures are considered within practices-as-performances. On an empirical level, there is evidence for individual or sub-group variations in the performance of collectively shared practices [5,7]. Furthermore, these variations can be explained by differences in norms (cultural norms and norms learned in childhood, but also norms that have developed through conscious reasoning) [5] and individual values [13]. Also, social-psychological studies [16] have repeatedly demonstrated that "there is no simple singular 'public'" (p. 73). Instead, attitudes and risk perceptions need to be considered in the context of historical developments and local contexts [16].

Contributing to the debate on the relationship between individual and structural factors in explaining routinized ECBs is important for at least three reasons. First, individual variations may be considered niches for changes in routines, and, on a larger scale, for social change [17]. Second, this debate indicates a substantial research gap. In at least some SPT versions [11,15], structural factors are considered the decisive behavioral components (cf. [18] for a more general approach to framing factors). Third, complementing Piscicelli et al. [13,19], there is an emerging strand of research demonstrating how conceptual and empirical work that draws on SPT may benefit from integrating elements of social-psychological theorization and vice versa [9]. This is in line with often-made claims that disciplinary boundaries should be transcended to make progress in understanding changes in household energy consumption [6]. Nash et al. [20] elaborated on integrating SPT and psychological approaches to analyze and promote positive

behavioral spillovers. The authors suggested that changes across different practices may co-occur with changes in competences (e.g., self-efficacy and skills) and meanings (e.g., goals and values). Boldero and Binder [10] have worked on localizing norms in an SPT framework by relying not only on SPT insights but also social-psychological understandings of norms and their contribution to changing routines.

Against that backdrop, our overarching goal is to contribute to explaining individual variations in routines and add empirical evidence to the debate on individual versus structural factors. Our conceptual starting points are the elements of practices in Shove et al.'s widely established framework [11], which operationalizes structural elements. Moreover, to analyze individual variations in routines, the different features of the elements of practice need to be clearly defined and operationalized. Here, we propose to use social-psychological constructs for theoretical and empirical reasons. First, there are reliable and widely tested scales and theoretical foundations for approaching individual variations in a survey. Second, studies along that line of reasoning, such as Piscicelli et al. [13], have suggested that social-psychological constructs explain differences in the performance of a practice. Materials, meanings, and competences build our overarching analytical categories. With our contribution, we hope to demonstrate the benefit of an integrative approach for empirical work on routinized energy consumption.

2. Analytical framework and hypotheses

Many constructs that we integrate from social psychology research into our framework have been widely studied. Therefore, we refrain from stating hypotheses related to well-established claims (e.g., on values) and focus on developing hypotheses that draw on the integration of practice-specific wants and materials in explaining individual variations in routinized ECBs. In developing a framework, we draw on Shove et al.'s [11] triad: the meaning, competence, and material elements of practice. We acknowledge that all constructs (e.g., "values" or "norms") used to operationalize the elements of practice are not genuine social-psychological constructs but likewise exist in sociological theorizing. However, the literature and the scales we use originate from psychological research.

2.1. The meaning element of practice

Shove et al. [11] used the term meaning "to represent the social and symbolic significance of participation at any one moment" (p. 23). Based on previous empirical and theoretical insights from SPT and social-psychological approaches, we suggest that norms and values may help to identify individual variations in performances of practices. Furthermore, we include practice-specific wants as a related SPT construct.

2.1.1. Norms

The concept of social norms is part of the theory of planned behavior (TPB) [21], a widely used social-psychological theory of behavior. Including social norms in models to explain individual action can be regarded as including structures residing outside the individual [22]. However, the individual is still emphasized because the focus is on a person's perception of what others expect from him or her [22]. Thus, social norms operate on the interrelation between the other and the self. Norm-confirming behavior is socially rewarded and, therefore, is an important aspect of the social significance of a practice. Also, empirical research based on SPT has emphasized the role of norms in influencing routines [5].

In most social-psychological literature, three forms of norms are distinguished: injunctive, descriptive, and personal. The first two relate to "the other" and the last to "the self" (for a distinction between the three, see Cialdini et al. [23]). In a meta-analysis, Bamberg and Möser [24] found a relatively strong correlation between social norms and