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Dividing or sharing? A time-geographical examination of eating, labour, and energy consumption in Sweden

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ABSTRACT

Many energy consuming household activities are collectively organized, while in information campaigns for energy conservation they are regarded as planned and performed by individuals in isolation. This article aims at scrutinizing this mismatch by analytically examining how energy-consuming activities are allocated and organized among household members and explore the implications for energy consumption. Time-geographic concepts ground for the investigation and empirical illustrations are taken from a uniquely rich historic Swedish pilot study on time-use from 1996. The pilot offers time-diaries from members of the same households which allow analysis on activity allocation in the households. We present a conceptual framework with two overarching principles of activity allocation; project division and project sharing. Visualizations of daily activity sequences from time-diaries in the pilot study are used to analyze the household project providing meals. The overall result indicates that the ways households allocate and coordinate energy consuming activities matter to energy use. Consequently, it is important to consider the household with its members for understanding daily energy consuming activities and people's possibilities to conserve energy. If reconfigured to fit into the interlinked everyday life activity sequences of household members, energy advice and information campaigns might improve the opportunities to reach their targets.

1. Introduction

A transition towards more energy-efficient household consumption is required if human-induced climate change and other environmental problems are to be mitigated. Though few question the existence of these environmental problems or consider them unimportant to combat at an overall level, the implementation of environmentally sound activities in everyday life on household level is insufficient [1–3]. According to Giddens [4], the threats posed by climate change are insufficiently "tangible, immediate or visible" to cause people to act in the course of everyday life. In addition, a significant part of households' energy use and carbon emissions are embedded in many basic household provision systems. Peoples' prime practical purpose of using these systems is to achieve results manifested by the functions and services they offer or facilitate and to perform socially meaningful activities in everyday life, for example, cooking, cleaning, washing, shopping, travelling, and self-care, and maintaining possessions [5–9]. Without adequate success, various energy conservation information campaigns have tried to influence how people carry out these activities in order to conserve energy [10]. Shortages of the campaigns, as debated in some of the literature, are that the messages delivered do not sufficiently fit the everyday life contexts of household members [11–14]. One mismatch is that information campaigns are directed towards individuals and do not take into consideration that most individuals actually live together in households [15]. Thus, and as addressed in this journal by Moezzi and Janda, energy policy has largely had an individual oriented approach to influencing peoples' energy related activities, ignoring the social and organizational character of peoples use of energy in everyday life [16].

As pointed out by Sovacool, there is a need for a variation of human centred research methods in order to capture the multidimensional role of human activities that shape energy consumption [17]. We believe that analysing time-diary data with a time geographical approach, will help understanding the social coordination and allocation of energy consuming activities from a household perspective, since the time-geographical concepts underline couplings, sequences and contexts.

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Environmental research, based on people's time-use for daily activities, often treats the incorporation of environmental issues into everyday life as questions of changing the activities on which people spend time and of whether people invest time in energy-saving actions within existing activities. Greenhouse gas (GHG) emissions and energy use are much higher for some activities than other and household members reduce their energy use if they spend more time on leisure activities at home instead of doing housework, since the latter generally consumes much more energy [18,19]. For instance, as Druckman et al. [18] found in a British time-use survey study, that the GHG intensity of various time uses in the "food and drink" category is nearly four times as great as that of leisure activities and 42 times as great as "sleep and rest" activities. The study demonstrates that a British adult spends on average 2.1 h per day on activities in the "food and drink" category, including eating, drinking, food preparation and dishwashing. The 2010/11 Swedish time use survey indicate that women spend 1.10 h and men 1.08 h per day on eating and 1.07 and 38 min, respectively, on food preparation and dishwashing [20]. Since many housework activities are energy intensive, the more time people spend performing such activities and the more such activities they perform per day, the greater their environmental impact [21].

However, reorganizing household activities in an environmentally sound way is not always easily done due to various constraints. An everyday life replete with individual activities, appointments and travel are key constraints [22]. Further, the replacement of energy-intensive habits with less-energy-intensive ones could entail needs to reorganize many other daily activities [23]. For example, one prerequisite is that time can be redistributed and, thereby, made available to reorganize household activities in an environmentally sound way, since changing the activities performed might result in substitute activities that require more time, such as sorting waste instead of throwing everything into the same bin, or commuting by public transport instead of fossil fuelled private car – i.e., a "time investment in the environment" (p. 373) [24]. Of course, both the process of adapting to the functions of newly adopted energy-saving artefacts and a possible increase in the time spent performing activities in the long run require time. Another condition for reorganizing the daily activities in an environmental sound line entails increased needs to coordinate and share technology use between the members of the household, such as cooking for everyone in the household instead of for oneself only, or sharing and using one car instead of individual use of two cars.

However, national time-use statistics are based on individuals, not households [20,25–27]. Also, they present the average minutes per day and individual for various activities, as in the example above about time spent on food provision. But provision of meals and other energy-consuming everyday activities usually are not performed just once per day or by individuals in isolation. Instead, these activities are performed partly jointly and partly individually and at different hours in the course of the day which implies that the activities for providing meals both interrupt and are interrupted by activities with other purposes. Therefore, conventional, individual-based time-use statistics do not fit our purposes. Instead, in this article we will use raw time-diary data from household members and the time-geographic approach for handling their activity sequences and we also acknowledge that the same individual may perform the same activity several times per day. Time geography [6,28–30], conceptualizes the everyday doings and strivings of household members directed towards specific goals as *projects* and the necessary *activities* performed to realize these projects. The examination of projects and the accompanying activities is based on whole activity sequences as described in individuals' time-diaries [28]. Time-geographic visualization of the activity sequences covering the same day of several members of the same household provides possibilities to explore how they allocate activities [31,32]. We use time-geographical concepts with the intention to conceptually grasp the division of energy intensive activities between adult household members as revealed by visualized time-diaries.

Our aim is to analytically explore how energy consuming activities are allocated between households members with the purpose to get a coherent ground to discuss and point out potential implications for energy consumption and conservation. The study is qualitatively oriented, and focuses on activities in the household project to provide meals. This project is chosen since everyone needs food on a regular basis, while the activities to provide meals can be allocated in different ways among household members sharing a home. Besides, the project, which consist of many energy related activities such as transport to and from grocery shop, the choice of food, cold storage of food, cooking meals, wash dishes and waste disposal, put to the fore the magnitude of the environmental impact of fulfilling a basic everyday purpose, and thus its relevance for stimulating energy conservation. Lindén demonstrated that food storage, meal preparation and dish washing together accounted for 43% of total use of household electricity in an average Swedish household [33]. Carlsson-Kanyama [34] highlights the consumption of food as one of the most energy demanding activities within a household.

Our explorative investigation results in a conceptual framework with two overarching principles of division of labour in the household, project division and project sharing. Based on these it is possible to identify and discuss potential implications for energy consumption and conservation of the households. We discuss the two principles in relation to energy consumption in terms of the:

- consequences for the time available to spend on less-energy-intensive activities or to invest in energy-saving actions; and
- consequences for coordinating energy-consuming activities and shared technology use.

The article contributes to knowledge about the allocation of energy consuming activities in the household and highlights problems to alter the division of labour. The energy relevance is underlined by the need to choose and to have the prerequisite to choose more sustainable and energy efficient solutions for how we organize our daily lives. Using a time-geographic approach with time-diaries and developing concepts that put the allocation of the everyday activities to the fore is a tool for making the households' organization of energy related activities visible. Thereby it informs a discussion on how the everyday activities can be organized in a more energy efficient way and facilitate an examination of possible impacts on energy consumption and conservation from household division of labour. In addition it problematizes individualistic models of energy consumption. From an energy policy perspective the result can be utilized for the development of information and support that better fit various households' everyday life contexts.

In the next section, we provide a brief overview of the energy-consuming activities involved in the project of providing meals. The method section presents the time-geographical concepts and the empirical data used. In the section thereafter we present and discuss our results; we demonstrate and exemplify the identified principles of how energy-consuming activities are collectively organized and allocated between household members and discuss implications for energy consumption and conservation. Finally, we present the conclusions and discuss how the result can inform energy policy.