The Antecedents of Energy-Saving Behavior for Policymakers

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Abstract

Recent studies have begun to bridge the gap between workplace pro-environmental behavior and workplace energy-saving behavior by adapting specific existing pro-environmental behavioral models to the workplace energy-saving environment. This article focuses on the workplace by conducting a multi-disciplinary literature review of research that has examined the influence of organization-based energy-saving behavior change initiatives. This paper combines the insights of the current workplace models to develop an integrated framework of energy-saving behavior in the workplace. An overview of the current pro-environmental and energy-saving behavior in the workplace literatures will be provided as well as their similarities and differences highlighted. The employee energy-saving behavior framework is provided, which contains individual, group, and organizational factors that have predictive relevance across different organizations. The proposed antecedents of workplace energy-saving behavior provide further insights into implications of specific interventions to develop targeted practices towards achieving environmental sustainability.

Keywords: workplace; employee; behavior change; energy-saving; environmental; sustainability.

Introduction

The goal of the energy-saving behavior providing in the workplace has just recently been explored by researchers and practitioners. To achieved this goal the examination of three domains: organizational, group and individual determinants is needed. The investigation of organizational and group level allows to determinate the context of the employee's decision making process and includes variables such as electricity saving climate, policy for environmental sustainability and green work climate perceptions of co-workers etc. The investigation of the individual level allows to determinate a direct individual energy-saving behaviour within the organization and group and include variables such as beliefs and environmental attitudes, personal image, environmental personal norms etc.

It has been acknowledged that to develop a broad scope of the antecedents of energy-saving behaviour in the workplace an integrated framework of energy-saving behavior in the workplace is required based on the synthesizing the existing workplace energy-saving literature. This approach will enable to compare the range of current theories and models on a like for like basis and will integrate the insights into one conceptual framework. It will provide the developing targeted practices for achieving environmental sustainability.

As noted by Miller (2013) the possibilities for energy savings are on energy use related habits, on repeated behaviors among office building occupants, or the routine behaviors driven by automatic, sub-conscious, quick cognition that contribute to wasted energy consumption. Achieving of sustainable development goals is not possible only by focusing on energy efficient technologies alone without behavior change. Loveday et al. (2008) argued in their study that nevertheless that homes and products have become more energy efficient during last decades, the "increasing numbers of products and the advanced technological innovation they contain have brought a sharp rise in domestic energy consumption" (p. 4641).

The indication of the interventions that were effectively applied will contributes for the formation of new, energy saving habits. It is advisable to agree with Miller (2013) who stressed that the habitual behavior must become learned, stored in memory, and retrieved in instances when individuals confront the new decision making context. Organizations that successfully implement change offer clearly defined and achievable goals, methods for measuring progress, commitment from those in positions of leadership, employee engagement, as well as two-way, consistent and constant communication. Keenan et al. (2012) suggest that less tangible factors must be communicate – such as self-worth and job satisfaction – that help gain emotional buy-in from employees. Bonini & Gorner (2011) argued that despite the potential value offered by sustainable organizational practices such as energy reduction measures, most organizations do not actively pursue these strategies and therefore miss an opportunity to reduce costs while also addressing climate change.

Similarly, the Peloza et al. (2012) point out another perceptual gap worth considering: organizations are often believed to perform better in sustainability metrics like energy consumption than their real performance, presenting both a risk to organizations in terms of their performance, reputation, as well as to the environment should the failures continue.

Furthermore it should be pointed out that barriers to behavior change include the tendency to ignore small energy savings opportunities, organizational failures, and lack of awareness, culture, and tradition. There is hence a resulting gap between intentions to reduce energy use and the actual adoption of energy saving actions.

The results of theoretical analysis of the workplace energy-saving behavior literature demonstrates that advances have been made to understand employee energy-saving behavior. However, the results also allow to justify that there is a need in the new practical tools for creation of separate interventions for each type of environmental behavior and each sector and type of organization is required. Therefore, it is suggested that combining the insights of the current workplace models can be useful to provide further knowledge into possible antecedents of workplace energy-saving behavior by developing a theory based on that findings. In order to do that, it was decided to use synthesis the current workplace energy-saving literature, which will be discussed in the next section.

In the following section the description of the methodology will be provided. Next sections will present the data gathering and analysis process. In the final sections of this article a revised set of the antecedents of energy-saving behavior will be presented and implications for business strategy, suggestions for policymakers and for future research in this area will be offered.

Methodology

The data analysis was done in three stages. At the first stage the process of selecting and naming categories from the analysis of the data was made. It is the initial stage in data acquisition and relates to describing overall features of the phenomenon under study. Variables involved in the phenomenon are identified and labelled. At the second stage the data was put together in new ways. This was achieved by seeking to identify causal relationships between categories. The aim was to make explicit connections between categories and sub-categories. The last stage involves the process of selecting and identifying the core category and systematically relating it to other categories. It involves validating those relationships, filling in. and refining and developing those categories.

Data Gathering

In order to be included the coding process, sources had to meet the following inclusion criteria:

a) The paper examined an intervention in the workplace to increase energy-saving behaviour. The intervention could have been part of a researcher instigated experiment, an intervention instigated by the organization or an intervention from outside the organization such as a government policy.

b) The publication examined an environmental sustainability.

Exclusion criteria:

a) It was published befor1980. The reason for limiting research by date is that organizational settings and their concern with environmental performance have changed significantly over time, and older research findings would have a strongly reduced validity in current organizations, thereby making these findings less useful for practitioners (McDonald, 2014).

b) The paper did not discuss individual-level energy-saving behavior.

c) The paper was not about behavior in a work context.

The data was gathered from the literature available in English on workplace interventions designed to increase energy-saving behaviour using an iterative multistage approach. Data from multiple sources provides different perspectives and the usage of different sources of information increases the validity of the model by bringing together evidence from different disciplines, including social psychology, organizational behavior, professional research, education, environmental psychology and business management (McDonald, 2014, Young et al., 2014, Norton et al., 2015).

To identify appropriate publications three techniques were used. The journals that publish studies in this field were identified. Then searches with environmental, pro-environmental, green, sustainable, energy, conservation, energy-saving, carbon dioxide, greenhouse gases as keywords for behavior, and environmental, corporate, and organizational as keywords for sustainability were performed. In order to find recent research, database searches using the same keywords were conducted next. The databases were PsycINFO, Science Direct, Web of Knowledge, Wiley Online, EBSCO Business Source Premier, Google Scholar and Web of Science. Then the sample for authors with two or more articles represented were checked, and their respective bibliographies for additional publications were searched. The search found a total of 214 potentially relevant publications. In the next step, we excluded articles using four criteria. This resulted in a final sample of 25 publications. Table 1 shows the summaries of the studies, geography and impact factors of journals.

Results

In order to compare the studies and also provide an overall perspective on them, the categories of factors were created based on the purpose of organizing the antecedents for energy-saving behavior. The data was analyzed systematically through three stages mentioned in previous section. Open coding was the first stage, which generated a lot of open codes for the data. Then these open codes were interpreted and categorized into higher concepts until the core categories emerged. Axial coding was the second stage, which tried to establish the relationship between the core categories and sub-categories.

The first stage began with reading through the articles explaining energy-saving behavior and highlighting the passages where the methodology, variables and results were discussed. Next, the articles were re-read for the purpose of generating open codes. The second stage began with the exercise of grouping the literature by the variables examined into different excel sheets. The process was one of constant comparison, based on the level of their denoting data for differences and similarities, which resulted in the creation of categories. The third stage was begun by writing theoretical memos on each category and the relationship between these, which resulted in 3 different categories: organizational factors, group factors and individual factors as the Table 1 below shows.

Table 1. Variables identified after 2nd and 3rd stage

1st stage	2nd stage	3rd stage
Environmental support	Attitudes	Organizational
Cost saving		
Organizational benefit		
Improving work conditions	Infrastructure	
Recycling behavior		
Org-level behavior		
Transformational		
Environmental behavior of an organization		
Green work climate perceptions		
Electricity saving climate		
Environmental management practices	Activities	
Financial incentitives		
Non-financial incentitives		
Training		
Visual aids		
Information		
An educational campaign		
Environmental strategy	Policy	
Policy for environmental sustainability		
Organizational strategies for Energy Conservation		
Social norms	Norms	Group
Social Comparison		
Collective self-efficacy		
Goal setting		
Collective feedback		
Comparative feedback		
Collective outcome expectancy		
Green team	Behavior	
Leader energy-saving behavior		
Green work climate perceptions of co-workers		
Supervisory support		
Environmentally friendly attitudes	Beliefs and environmental attitudes	Individual
Attitude towards technology		
Attitude toward electricity saving		
Engagement with feedback		
Environmental benefit		
Policy beliefs		
Injective norms	Norms	
Personal norms		
Environmental personal norms		
Environmental identity		
1st stage	2nd stage	3rd stage
Perceived behavioral control	Behavior	
Perceived environmental behavior of an organization		

Habits		
Other pro-environmental behavior		
Internal motivation	Motivation	
Personal image		
Enjoyment		
Individual-level feedback		
Perceptions of incentives from an organization		
Impact awareness	Environmental awareness	
Perceived harm		
Environmental worldviews		

Source: own work

At the organizational level it was created four categories, that include attitudes (with subcategories for attitudes for environmental support, cost saving and for other organizational benefit), policy (with subcategories for environmental strategy and for environmental sustainability policy), infrastructure (with subcategories for improving work conditions, recycling behavior, org-level behavior, transformational, environmental behavior of an organization), activities (with subcategories for environmental management practices, financial incentives, non-financial incentives, training, visual aids and information). Organizational factors operate at the broader scale of the organization, acting as part of the organizational context, which may enable or constrain the success of any behavior change initiatives (Young et al., 2013).

At the group level it was created two categories, one for norms (with subcategories for social norms, social comparison, collective self-efficacy, goal setting, collective feedback, comparative feedback, collective outcome expectancy) and one for behavior (with subcategories for leader energy-saving behavior, green work climate perceptions of co-workers, green team and supervisory support). Croup factors are the day-to-day influences of managers and colleagues on an employee's behavior. They fall in between individual factors and organizational factors (Young et al., 2013).

Finally, at the individual level variables were organized into five categories, that include beliefs and environmental attitudes (with subcategories for environmentally friendly attitudes, attitude towards technology, attitude toward electricity saving, engagement with feedback, environmental benefit and policy beliefs), norms (with subcategories for injective norms, personal norms, environmental personal norms and environmental identity), behavior (with subcategories for perceived behavioral control, perceived environmental behavior of an organization, habits and other pro-environmental behavior), motivation (with subcategories for internal motivation, personal image, enjoyment, individual-level feedback and perceptions of incentives from an organization) and environmental awareness (with subcategories for impact awareness, perceived harm and environmental worldviews). Individual factors relate to the psychological/cognitive factors that are involved in individual decision-making by the employees (Young et al., 2013).

Based on the available research, there are three broad categories that have been clearly shown to play a role in employee energy-saving behaviour change, namely individual level, group level and organizational level factors. Within these categories, specific factors that are important are as follows:

At the individual level. Employee environmental awareness is important in terms of being aware of the organization's potential impacts and more importantly knowing their individual responsibility in helping to reduce this input. This included knowledge about methods of energy conservation and energy-consumption processes (Jones et al, 2012; Lo et al., 2012) or reminders to turn off lights and computers (Schelly et al, 2011).

At the group level. Comparative feedback is important at the group level (Siero et al., 1996; Staats et al., 2000) In particular, Comparative group feedback regarding performance on an environmental initiative improves environmental performance significantly more than general communication alone (Young et al., 2013).

At the organizational level. Policy for environmental sustainability (Norton et al., 2014; Lo et al., 2012) and organizational electricity saving climate (Zhang et al., 2013b) were shown to be essential in providing energy-saving behavior in offices.

The new modified process framework of multilevel determinants for employee energy-saving behaviour, as shown in Figure 1, is based on the limited research evidence available and hence should be seen as a next step in framework development rather than a complete and final framework (Young et al., 2014). It shows the factors that have strong evidence and limited evidence to support their positive influence on energy-saving behaviour at workplace.

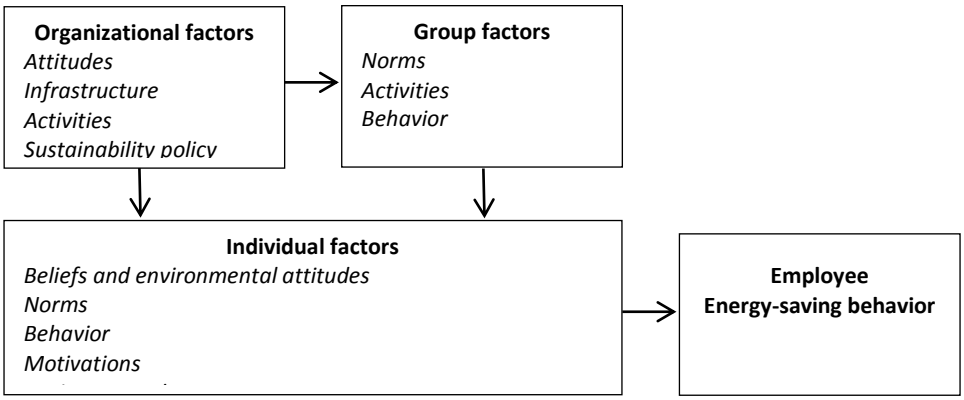

Figure 1. Integrated framework of multilevel determinants for employee energy-saving behaviour

Conclusions

The major contribution of this review is in synthesis of the leading models and theories explaining workplace energy-saving behavior and through this process, propose the scheme of multilevel determinants for employee energy-saving behaviour in the workplace. It allows to highlight the important distinction between organizational, group and individual antecedents. The results of points to a bias toward studying the antecedents of energy-saving behavior, and with the notable exception of behavioral intention. Furthermore, practitioners can use proposed scheme as a guide to explain the mechanisms of driving energy-saving behavior to provide environmental sustainability.

Disclosure Statement

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