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Psychological interventional approach for reduce resource consumption: Reducing plastic bag usage at supermarkets

Shoji Ohtomo [a,*], Susumu Ohnuma [b]

[a] Department of Psychology, Faculty of Human Sciences, Konan Women's University, 6-2-23, Morikita-machi, Higashinada-ku, Kobe 6580001, Japan
[b] Department of Behavioral Science, Graduate School of Letters, Hokkaido University, North 10 West 7, Kita-ku, Sapporo 0600810, Japan

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ABSTRACT

A field study was conducted to investigate the reduction of plastic bag usage at supermarkets. Many behaviors leading to potential damage to the environment may be unintentional. This study applied a dual motivation model to plastic bag usage and examined the effects of an intervention aimed at promoting pro-environmental behavior. A voice prompt intervention was implemented in Japanese supermarkets. In the first (control) week, shoppers were given free plastic bags by the cashier. In the second (intervention) week, cashiers asked shoppers whether they wanted plastic bags. We collected observational and questionnaire measures of variables that predicted free plastic bag usage during the intervention. The results supported a dual motivation model of behavioral change. The voice prompt decreased the usage of plastic bags by both discouraging unintentional usage and encouraging an intentional reduction in usage. Possibilities for interventions designed both to attenuate unintentional motivation and to promote intentional motivation are considered.

1. Introduction

"Think Globally, Act Locally" is one of the most famous slogans in environmental activism. Because local activity is necessary to reduce carbon dioxide emissions, an interventional approach (e.g., Bamberg et al., 2003; Heath and Gifford, 2002) is one of the recommended strategies for encouraging individuals to engage in pro-environmental behaviors in their everyday life. Reduction of the usage of plastic bags is an effective pro-environmental behavior that relatively few people engage in, despite the small effort required to do so (e.g., Ayalon et al., 2009; Convery et al., 2007; Funaki, 2006). In particular, most Japanese supermarkets provide free plastic bags for shoppers to carry their purchases, and consumers use these bags excessively. According to one estimate (Funaki, 2006), 302 thousand tons of plastic (i.e., 44 billion plastic bags), that is 24 kg (i.e., 360 plastic bags) per person, are consumed every year in Japan. Another study (Eco-Design Forum for Civic Society, 2010) estimated that one person not using plastic bags for a single year would reduce carbon dioxide emissions by 18.9 kg. Therefore, reducing the usage of plastic bags is considered one of the most simple and effective resource reduction behaviors that everyone can perform on a daily basis.

A few people strive to reduce their usage of free plastic bags. Although most people in Japan are environmentally concerned and have some reusable plastic bags, they often use free plastic bags at supermarkets. Funaki (2006) revealed that approximately 30% of plastic bags in households, obtained for free while shopping, are disposed without being used at all, and there are five plastic bags in disposed wastes on average. According to the estimate of the Global Warming White Paper (2013), over 300 plastic bags per person are consumed every year. Usage of free plastic bags at supermarkets is a repetitive type of behavior in daily life, which is acknowledged as a habit (Aarts and Dijksterhuis, 2000; Ouellette and Wood, 1998). The habituation of free plastic bag use induced an inconsistency between people's environmental concern and their actual behavior. Through repetition of behavior in the same context (e.g., regular supermarket), plastic bag usage is likely to become a habitual behavior that is activated automatically. People who have formed a habit behave automatically by reacting habitually in the same behavioral setting, without further consideration of other available alternatives (Danner et al., 2008; Neal et al., 2011). Thus, habitual behavior is elicited automatically by a response to the behavioral context regardless of environmental concerns, as long as the behavioral context is stable.

Although there have been some field experiments aimed at promoting environment-friendly behavior, particularly in relation to travel mode choice and water and energy conservation (Bamberg et al., 2003; Heath and Gifford, 2002; Verplanken et al., 1998), only a few field studies have focused on and measured habits

* Corresponding author. Tel.: +81 78 413 3021.
E-mail address: s.ohtomo@konan-wu.ac.jp (S. Ohtomo).

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for promoting resource reduction behaviors. Knussen and Yule (2008) investigated the role of recycling habits in the disposal of household waste. They suggested that the lack of a recycling habit was an obstacle to behavioral change. Therefore, the purpose of this study was to conduct a field study to intervene in the behavioral context that induced habitual behavior and to clarify psychosocial determinants of environmentally friendly behavior.

2. Theoretical framework

The theory of planned behavior (TPB: Ajzen, 1991; Ajzen and Madden, 1986) has been one of most frequently cited models, in many domains of social science, for understanding some psychosocial determinants of human social behavior (Nosek et al., 2010). The TPB postulates that human actions are a result of consciously controlled or deliberative decision-making. According to the TPB, an attitude does not directly determine behavior, but does so only indirectly via a behavioral intention, which is a deliberative motivation. The TPB also stresses the importance of social influences in the behavioral decision. In addition to the influence of attitude, the behavioral intention is also determined by perceived behavior control (PBC), which reflects the extent to which an individual feels it to be easy or difficult to perform the behavior in a given situation.

A subjective norm is viewed as a third factor influencing behavioral intention. In the framework of TPB, a subjective norm is conceptualized as a social pressure derived from the expectations of important reference persons or groups regarding whether a behavior should or should not be performed.

The TPB has been successfully applied to examine the psychosocial determinants of resource reduction behaviors. For example, a study by Thøgersen (1994) suggested the utility of the TPB framework to reveal the motivational process of recycling behavior. Tonglet et al. (2004a) applied TPB to identify the determinants of recycling behavior in a local curbside recycling scheme, and suggested that attitude and past recycling behavior were the important determinants of intention. Moreover, Tonglet et al. (2004b) showed that different factors are involved in waste minimization and recycling behaviors. Knussen et al. (2004) also examined recycling behavior using the TPB framework. They reported that the relationship between perceived behavioral control and behavioral intention was weaker for people who perceived that they lacked facilities for recycling.

However, recent studies have suggested the framework of TPB has a limited ability to predict behavior, because the TPB model is premised on deliberative or intentional decisions (Gerrard et al., 2008). In a meta-analysis of studies applying the TPB to environmental behavior, Bamberg and Möser (2007) reported that behavioral intention (i.e., the proximal antecedent of behavior) explained only 27%, on average, of the variance in environmental behavior. In addition, the results of a meta-analysis of intervention studies based on the TPB framework indicated that changes in intention engendered fewer changes in behavior (Webb and Sheeran, 2006). These findings suggest that the inconsistency between behavioral intention and actual behavior might be caused by a "habitual reaction" or a "non-intentional route to behavior," regardless of behavioral intention.

In an effort to improve the predictive power of TPB, the prototype model examines behavior in terms of not only intentional motivation but also unintentional motivation (Gibbons et al., 1998, 2009). The prototype model assumes that two types of motivation are involved in social behavior. The first is behavioral intention (Ajzen, 1991; I intend to do an action), which is conscious deliberation leading to intended behavior (similar to TPB).

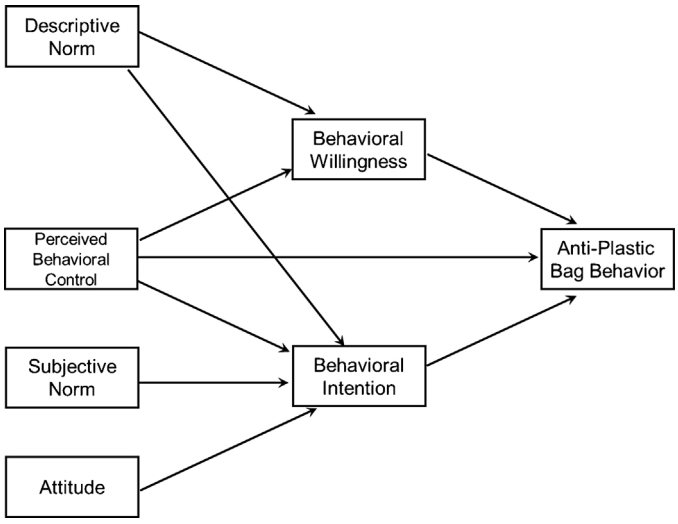

Fig. 1. Theoretical model for anti-plastic bag behavior.

The second is behavioral willingness (Gibbons et al., 1998; a given situation elicits an action), which is a reaction to a situation leading to unintended or unplanned behavior. Behavioral willingness is considered as the unintentional motivation that is elicited by circumstances conducive to impulsive or spontaneous behavior, regardless of the individual's intention (Gerrard et al., 2008; Gibbons et al., 2006). The dual-process perspective of this model is able to predict both intended behaviors based on a conscious motivation, and unintended behaviors based on a spontaneous reaction to a given context (Gibbons et al., 2009). The prototype model has been found to be effective where the behaviors are determined not only by intention, but also by unintended behavioral willingness, particularly in predicting socially undesirable behaviors such as risky sexual activity (Gibbons et al., 1998; Thornton et al., 2002) and use of substances such as alcohol, tobacco, and drugs (Gerrard et al., 2002; Gibbons et al., 2004).

Ohtomo and Hirose (2007) extended the prototype model to apply to recycling behavior. This model focused on the effects of contrary motivations (i.e., behavioral intention vs. behavioral willingness), to reveal the intention–behavior gap in environmental behavior. Their results showed that recycling behavior was determined by both behavioral intention (i.e., conscious motivation) toward eco-friendly behavior, and behavioral willingness (i.e., unintentional motivation) based on a reaction to a situation affording eco-unfriendly behavior (Fig. 1). This indicated that recycling behavior was promoted or inhibited, depending upon whether the intentional motivation or the unintentional motivation was more salient. They also tested the antecedent factors of these dual motivations and found that behavioral intention was affected by both a subjective norm (i.e., perceived approval or disapproval by others) and attitude toward the environment, while behavioral willingness was affected by a descriptive norm (i.e., perceptions of how most people behaved). Therefore, the framework of the prototype model is appropriate for examining the different processes affecting pro-environmental behavior, including both intentional motivations based on individuals' volition, and unintentional motivation elicited by given situations. This model is also suitable for exploring the determinants of such dual motivations. However, little research has examined the dual-motivation model in a real situation, particularly in relation to interventions aimed at changing non-intentional routes (i.e., willingness–behavior relationships) to habitual eco-unfriendly behaviors.