



# Transformation from intentions to habits in travel behavior: An awareness of a mediated form of intention



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## ARTICLE INFO

### Article history:

Received 25 June 2015

Received in revised form 19 June 2017

Accepted 1 July 2017

Available online 20 July 2017

### Keywords:

Intention

Automatic intention

Habit–Intention relation

Travel behavior

Bus service

## ABSTRACT

Travelers' behavioral intention and habits are well-known constructs in the literature of travel behavior. In general, behavioral intention and habits explain the deliberate process and the habitual process of travelers' behavior, respectively. While behavioral intention is considered as a goal-dependent deliberation, habits are not fully defined due to different views of researchers. The stimulus-response approach describes habits as a goal-independent automaticity, whereas the script-based approach views habits as a goal-dependent automaticity. The controversy in understanding the association between goals and habits necessitates a focus on the establishment of habits in which habits are assumed to appear due to a repetition of behavioral intention. With an aim to understand the process of transformation from intentions to habits, this study focuses on a mediated form of intention that is close to habits. It is hypothesized that the mediated form has characteristics similar to those of habits. Empirical support for the hypothesis was obtained in public transportation domain. The findings of this study are important for the field because they present a possibility that past research has investigated the mediated form of intention instead of habits.

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## 1. Introduction

Negative effects of excessive private car use on the environment are widely recognized in the literature of transport studies. This has led to an urgent need to foster travel behavior change (i.e., the switch from private cars to public transportation), which requires knowledge of the travel decision-making process.

From the psychological perspective, travelers' mode choices have been explained in terms of either a reasoned-action process or a habitual process. The theory of planned behavior (TPB) is widely used for representing the reasoned-action processes (Ajzen, 1991). This theory assumes that travelers' behavioral intention results from a deliberation process, making the variable an essential predictor of choice (Bamberg, Ajzen, & Schmidt, 2003; Bamberg & Schmidt, 2003). The TPB model has been widely supported by later studies regarding travel mode choice (Forward, 2004). On the other hand, the habit approach, which can account for weaknesses of the TPB in dealing with frequently repeated behaviors (Gardner, 2009), has recently attracted attention as well (Bamberg & Schmidt, 2003; Fujii & Garling, 2003; Garling, Fujii, & Boe, 2001).

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While there is a general agreement among the researchers about the mechanism of the reasoned-action process, the mechanism of habits' effects is unclear due to the different definitions of habits. Gardner (2015) showed at least eight different definitions of habits. Even though Gardner seems to support a definition proposed by West and Brown (2013), such understanding is partially disputed by Orbell and Verplanken (2015). A similar debate was also noted for the measurement of habits (Gardner, 2015; Orbell & Verplanken, 2015). Eventually, a contradiction of the association between habits and goals was observed. Among the two approaches to habits (Friedrichsmeier, Matthies, & Klockner, 2013), the associationist approach (Neal, Wood, & Quinn, 2006; Wood & Neal, 2007; Wood, Quinn, & Kashy, 2002; Wood, Tam, & Guerrero, 2005), which defines habits based on stimulus-response connection, recently suggested that a habit is a goal-independent automaticity (Neal, Wood, Labrecque, & Lally, 2012; Wood & Neal, 2009). This contradicts the script-based approach (Fujii & Garling, 2007; Verplanken & Aarts, 1999; Verplanken, Aarts, van Knippenberg, & van Knippenberg, 1994), which views habits as a goal-dependent automaticity through the association between scripts and goals. Further references on the differences among existing habit measures can be found in Friedrichsmeier et al. (2013) study.

The controversy about habits suggests a need to examine their establishment. The literature of habit studies shows that habits are commonly supposed to appear due to a repetition of behavioral responses. Verplanken and Wood (2006) defined habits as "a type of automaticity in responding that develops as people repeat actions." Wood and Neal (2009) stated that "habits develop as people respond repeatedly." Nilsen, Roback, Broström, and Ellström (2012) indicated that habits are formed due to "a behavior that has been repeated." Because behavioral responses can be either displayed in action or behavioral intention, it is reasonable to assume that habits are likely a transform of behavioral intention. Notably, because the start of the behavior necessary for the repetition is obviously deliberate (Garling et al., 2001), habits are thought to originate from a goal-dependent identity.

Because a behavioral repetition naturally requires some time, the intention-habits transformation is supposed to be time-consuming. In other words, a quick change from behavioral intention to habits is likely impossible. As such, a mediated form of intention might exist, which is expected to be close to habits, that is, more characteristics of habits. For example, the mediated form is expected to be less deliberate (i.e., more automatic) compared with behavioral intention. Thus, a successful demonstration of the existence of the mediated form will aid in understanding the complicated nature of habits. In particular, it may emphasize the importance of viewing habits in the context of the entire establishment process.

Considering all of the abovementioned issues, the present study aims to investigate a mediated form of behavioral intention established during the intention-habits transformation in the context of travel mode choice. To achieve this goal, the investigation primarily focuses on the two following two aspects. First, arguments for the existence of the mediated form and a hypothesis describing its characteristics are provided. Second, a novel measure of the mediated form is proposed. Three typical types of daily trips in the context of bus service are investigated to provide empirical support for the theoretical design.

## 2. Theoretical design

The existence of a mediated form of behavioral intention was found in accordance with popular dual-mode processing models (Smith & DeCoster, 2000) and the reasoned-action perspective. An always-activated review of behavior is not necessary in the TPB (Ajzen, 2002). Rather, a well-established intention can be activated automatically without the involvement of a conscious supervision (Ajzen & Fishbein, 2000). These suggestions of the reasoned-action theory show that behavioral intention can exist in two forms, the not-well-established intention and the well-established intention. The not-well-established intention (referred to in this paper as planned intention) is commonly referred to in the reasoned-action theories, whereas the well-established intention (referred to in this paper as automatic intention) is less deliberate and has not been widely discussed in the literature.

In view of the script-based approach, automatic intention can be defined as individuals' intentions that are automatically retrieved from scripts. Scripts allow individuals to quickly determine the strength of effort necessary to review the behavior in question. If the situational context matches well with the stored scripts, the strength of the behavioral review effort will be weak, leading to a high likelihood of continuity with the previously established intention. In contrast, if the situational context does not match well with the stored scripts, efforts to review the behavior will be strong, and thus, a new planned intention becomes more likely to be implemented. As described, automatic intention exists only if the difference between the context and stored scripts is not strong enough to activate a new planned intention.

Notably, automatic intention is found to be close to habits due to its description. As indicated by Ajzen and Fishbein (2000), the automatic activation of the well-established intentions (i.e., automatic intentions) can be performed without conscious awareness. This is similar to most of the existing definitions of habits. Nilsen, Bourne, and Verplanken (2008) defined habits as "cued relatively directly by environment, with minimal amount of purposeful thinking without any sense of awareness." Ouellette and Wood (1998) described habits as "automatic and can be performed quickly in parallel with other activities and with allocation of minimal focal attention." Similarly, van 't'Riet, Sijtsema, Dagevos, and de Bruijn (2011) suggested that habits are largely outside of people's conscious awareness.

Despite their similarities, automatic intention should be distinguished from habits. The most fundamental difference is that automatic intention is still found inside of a person's conscious awareness, while habits are not. A more clear distinction between the different decision-making processes can be drawn by noting that, in planned intention, all attributes are

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