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Reducing car use by volitional strategy of action and coping planning enhancement

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ABSTRACT

Personalized travel plans have been regarded as potentially effective soft measures in mobility management. This research conducted a randomized social experiment aiming at citizen car-use reduction, and examined the effect of implementing two personalized travel plans: action plans and coping plans. The two types of plans were designed respectively for enhancing action planning and coping planning as the volitional factors of behavior change. The results supported the effectiveness of the combined action-plus-coping plan intervention in reducing car use, but not of the action plan alone intervention. In addition, the influence of intervention on behavioral intention, action planning, and coping planning, were also presented.

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1. Introduction

Soft transport policy measures have been increasingly discussed and tentatively applied to achieving various goals of mobility management, particularly in Japan, Australia, Germany, the UK, and several other European countries (Cairns et al., 2008; Friman, Larhult, & Garling, 2013; Fujii & Taniguchi, 2006; Meloni, Sanjust di Teulada, & Spissu, 2016; Moser & Bamberg, 2008). Traditional hard measures on regulations and infrastructure, which have often been impeded by financial infeasibility, public opposition or political concerns (Cools et al., 2011; Garling & Schuitema, 2007; Jones, 2003). In contrast to such measures, soft measures in a relatively cost-effective method aim to trigger voluntary behavior change by influencing the psychological factors that underlie the behavior change process.

In the soft measures for mitigating car dependence or promoting public transport use, personalized travel planning (PTP) provides commuters with, or assists them in formulating, the individual-tailored information on travel behavior change based on their own travel needs or characteristics (Meloni et al., 2016). Such a personalized communication applied to voluntary travel behavior change has been considered more effective than mass communications or other non-personalized ones of which information is frequently neglected (Bamberg, 2013a; Fujii & Gärling, 2007; Fujii & Taniguchi, 2006; Gärling & Fujii, 2009). The theoretical grounding of PTP can be categorized into two main clusters: (1) the norm-activation model (Schwartz, 1977) and the theory of planned behavior (Ajzen, 1991) in which the identified cognitive factors, such as consequence awareness and personal norms, jointly constituting the motivational phase of behavior change process, and (2) the theories surrounding self-regulation (Gollwitzer, 1996; Gärling & Fujii, 2002) in which the factors, such as

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implementation intention and self-efficacy, underlying the volitional phase. Thus, the personalized travel plans (PTPs) that enhance these psychological factors might effectively lead commuters to break habitual travel behavior or form new one.

According to the two categories above, the strategies of PTP could be referred to, in this research, as “motivational strategy” and “volitional strategy” which are respectively based on the motivational phase and the volitional phase of behavior change process (Kuhl & Fuhrmann, 1998; Schmitz & Wiese, 2006). While the motivational strategies (e.g. travel awareness campaign) are applied earlier and wider than the volitional strategies (e.g. workplace travel plan formulation), the volitional ones have been gradually increasing in recent years (Cairns et al., 2008; Fujii & Taniguchi, 2006). However, the volitional factors that impact on behavior change, and the mechanism how the factors trigger behavior change, have been paid little attention by PTP schemes and their effectiveness evaluations. In the process of travel behavior change, only implementation intention is identified as the foundation of volitional strategy for bridging the intention-behavior gap (Sheeran, 2002). The lack of theoretical basis has prevented the volitional strategies of PTP from further development and extension.

In contrast, in the fields of health psychology, behavioral medicine, and education, the role of volitional factors and the effectiveness of developed interventions based on volitional factors in behavior change have been considerably explored (Bearth, Cousin, & Siegrist, 2014; Evans, Kawabata, & Thomas, 2015; Gaston & Prapavessis, 2014; Ghisi, Grace, Thomas, & Oh, 2015; Lhakhang, Godinho, Knoll, & Schwarzer, 2014; Sanetti, Collier-Meek, Long, Kim, & Kratochwill, 2014; Zhou, Jiang, Knoll, & Schwarzer, 2015). Among the volitional factors suggested by those studies, “action planning” and “coping planning” are two key mental simulations that help translate behavioral intention into target behavior.

Action planning is similar to implementation intention, but has been applied in facilitating more deliberate behavior, distinguished from implementation intention in more automatic one (Hagger & Luszczynska, 2014). Specifically, action planning refers to specific situational parameters (“when” and “where”) and a sequence of actions toward target behavior (“how”). When these elements are explicitly specified by a person who has not yet formed a behavioral habit, the intention of actions is not easily ignored or dismissed (Gollwitzer & Sheeran, 2006; Schwarzer, 2008a).

The other mental simulation, coping planning, involves a link between “anticipation of barriers” and “strategy for overcoming barriers.” The former anticipation is to foresee the scenarios that obstacle actions toward target behavior. The latter strategy is to in turn develop ideas for overcoming the scenarios in advance (Schwarzer, 2008a; Sniehotta, Schwarzer, Scholz, & Schuz, 2005). Imaging potential barriers and generating coping ideas may proceed only after contemplating situational parameters of actions and how to act (Schwarzer, 2008a). This sequence suggests that coping planning may make action planning adjustable and flexible, or otherwise reinforce it, and thereby more probably lead to behavior change.

For travel behavior change, action planning and coping planning also have been integrated into the theory framework of self-regulated behavioral change (Bamberg, 2013b) as the constructs in the actional stage. Hence, the understanding of the two planning constructs may provide insight into the behavior change process and the development of volitional strategies. However, to date there has been little empirical investigation on coping planning, or its conjunction with action planning, in travel behavior research. Moreover, the effect of coping planning techniques on travel behavior and psychological factors is less known. Therefore, the role of coping planning in voluntary travel behavior change and the effectiveness of soft measures based on coping planning need to be clarified.

1.1. *The present research*

This research aimed to examine the effectiveness of the volitional interventions based on action planning and coping planning enhancement in citizen car-use reduction. For this purpose, a randomized social experiment in a pre-test-post-test control design in Taipei City, Taiwan, over one-month period was conducted. Two kinds of volitional interventions, “personalized action plans” and “personalized action-plus-coping plans,” were developed and implemented in two distinct experimental groups. The action plan intervention mainly followed the PTPs assisting commuters to form alternatives to car use; in contrast, the action-plus-coping plan intervention combined the action plan intervention with a barrier-focused strategy to reinforce the formulated action plans or make the plans adjustable. The data collected in the experiment was used to analyze the effects of the two interventions in behavior change, from which the extraneous influence that revealed in the control group was eliminated. In addition to behavior change, the changes in behavioral intention (abbreviated as intention below), action planning, and coping planning were also analyzed to explore the influence of the interventions in the volitional phase. Finally, the recommendations for future travel behavior research on the development of volitional strategy and the volitional phase of behavior change were presented.

2. Method

2.1. *Procedure and interventions*

The participants of the social experiment were recruited in Taipei City, the capital of Taiwan. Because there is a high-quality public transport system in this city, it is feasible to persuade citizens to switch to public transport from car use that they are not captive to. The experiment was launched in March and ended in April of 2016 over a one-month period. The participant recruitment contained two stages: email invitation and web interview. Initially, invitation emails were sent to 8459 potential participants randomly from a list provided by a marketing research company in Taiwan; the list was

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