

# RECREATE YOUR COMMUTE: AN APPLICATION OF THE THEORY OF PLANNED BEHAVIOR ON CYCLING AS TRANSPORTATION

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## **Abstract**

Increasing cycling for transportation has been shown to be instrumental in addressing current health, transportation, mobility, and environmental sustainability issues. The Recreate Your Commute project is a social marketing campaign comprised of a series of twenty-two interpretive signs and a website designed to promote the use of cycling for transportation and safe road sharing. Based on the Theory of Planned Behavior (TPB), it addresses the cultural and personal beliefs and barriers that hinder participation and decrease safety. A pilot of the signs suggests the application of the TPB to interpretation is an effective means of influencing beliefs, and therefore behavior. While more research is needed, this project demonstrates a means to encourage engagement and promote behavior change (i.e., decrease vandalism, increase the use of Leave No Trace principles). This has important implications in the fields of natural resource management and recreation.

## **1. 1.0 Introduction**

Professionals in recreation and park management are often challenged by the need to influence behavior and encourage engagement. Examples include increasing visitors' use of Leave No Trace principles, decreasing vandalism, increasing program participation, and facilitating the adoption of healthier lifestyles or environmental stewardship. The Theory of Planned Behavior (TPB) provides a framework to better understand the factors involved with behavior, thereby serving as a means to formulate more effective interventions (Fishbein, 2008). One application is its utility to enhance the effectiveness of issue-based interpretation.

The question of how to generate behavior change is critical given the vital role of recreation in addressing a variety of current issues including obesity, the effects of what Louv (2008) has termed nature-deficit disorder, and environmental degradation. For example, increasing utilitarian cycling has been shown to be instrumental in improving health, sustainability (e.g., environmental and economic), and transportation problems. While a significant modal shift has already been realized in many European nations, the U.S. lacks a tradition of utilitarian cycling (Pucher, Komanoff, & Schimek, 1999). Realizing a significant increase in cycling for transportation requires cultural change (Gaterslaben & Appleton, 2006; Pucher et al., 1999) and is dependent on numerous, complex, interrelated variables across cultural, political, and physical realms. The Recreate Your Commute project is a research based, social marketing campaign designed to promote awareness of cycling as a desirable and feasible means of transportation, aid in the reduction of barriers to participation, and promote safe road sharing by motorists and cyclists. It also provides an example of how the TPB can be utilized to enhance the effectiveness of behavior change efforts.

There is significant empirical support for the TPB (Ajzen, 1991; Chatzisarantis & Hagger, 2005; Darker, French, Eves, & Snihottaet al., 2010; Fishbein, 2008), including its use in understanding and influencing choice of travel mode (Bamberg, Ajzen, & Schmidt, 2003; Bamberg & Schmidt, 2001). The theory posits behavior is the result of intentions created by three types of beliefs: normative, behavioral, and control. Behavioral beliefs refer to the perceived consequences of the behavior and determine if a person's attitude towards it is positive or negative. Normative beliefs are determined by social and cultural norms, while efficacy (e.g., perceived levels of control, confidence, and difficulty) generates control beliefs (Darker et al., 2010). Ajzen (1991) writes, "Each reveal a different aspect of the behavior, and each can serve as a point of attack in attempts to change it" (p. 207). It should be noted that the principle of specificity is important, and that the term "beliefs" refers to those relevant to the behavior in question rather than general or global beliefs and individual may hold (Ajzen, 1991; Fishbein, 2008; Scott, Eves, French, & Hoppe et al., 2007).

<Insert figure 1 here>

While interpretation is a common element at natural and cultural sites, it has great potential for other applications. Research has shown it to be effective not only for transmitting information, but also in influencing beliefs and behavior (Kohl, 2005), especially when combined with models such as the TPB and the Environmental Interpretation Behavior Change Model (Knapp, 1996; Madin & Fenton, 2004). According to Ogilvie, Hamilton, & Petticrew (2004), "interventions that engage people in a participative process and address factors of personal relevance may be more effective than those that simply aim to raise awareness or impose changes in the physical and economic environments" (p.4). This idea forms the foundation of

interpretation, as well as having implications for applications of the TPB.

Research related to attitudes towards cycling and barriers to participation are highly consistent. The most cited benefits of commuting by bike are enjoyment, fitness, environmental, convenience, and cost (Garrard & Hackman, n.d.; Merom, Miller, van der Ploeg, & Bauman et al., 2008; Ojoa, Vuori, & Paronem et al., 1998; Unwin, 1995). Constraints may be categorized as intrapersonal (e.g., lack of fitness, skill/knowledge, and social support; perceptions of time), environmental/structural (e.g., topography, climate, lack of infrastructure and facilities), and cultural norms generated by stereotypes and the car-centered nature of the U.S. culture. Perceptions of danger are by far the greatest deterrent to potential cyclists, followed by lack of infrastructure and social acceptability (Ojoa et al., 1998; Unwin, 1995; Wardman, Tight, & Page, 2007). Despite being one of the most equitable forms of transportation, the vast majority of cyclists (76%) are affluent white males (Lea, 2003; Pucher et al., 1999; Shepard, 2008) despite it being one of the most equitable forms of transportation. As with leisure and recreation in general, barriers for cycling impact women more than men (Garrard & Hakman, n.d.; Lea, 2003; Ojoa et al., 1998). For example, women are less likely to try cycling than men and report fear of accidents three times more often (Ojoa et al., 1998). In addition, the stereotype of cycling being for young, fit, white males and requiring special clothes and equipment confirms its “otherness” for most people (Unwin, 1995). Efforts were made to consider underserved populations (e.g., people of color, low income families, and elders) in this project. For example, a dog was chosen as the mascot to represent cyclists in the illustrations so they would be as gender and racially neutral as possible. However, more improvement is needed in this area since various subcultures are likely to have beliefs and constraints not shared by the general population.

## 1. 2.0 Methods

Accurate identification of beliefs related to the target behavior is critical when developing interventions. Protocols for conducting belief elicitation studies are provided by Azjen (2002) and Francis et al. (2004). Other methods include ethnographic interviewing and focus groups. This project utilized existing research related to attitudes and barriers to cycling to determine the target beliefs due to the consistency across studies in this area. This information was augmented by informal interviews with the target population and collaboration with several city councils and departments.

The principles of interpretation were used to create twenty-two messages based on the identified beliefs and constraints. While the majority target potential cyclists, others are aimed at either current cyclists or motorists. Recurring themes include the concept of bikes being vehicles and belonging on the road, and both motorists and cyclists being responsible for safety. Efforts were made to consider underserved populations (e.g., people of color, low income families, and elders) in this project. For example, a dog was chosen as the mascot to represent cyclists in the illustrations so they would be as gender and racially neutral as possible. However, more improvement is needed in this area since various subcultures are likely to have beliefs and constraints not shared by the general population.

Creation of the preliminary designs was followed by an evaluation of the concepts and content to ensure the TPB constructs were being targeted. For example, “Don’t Be A Squirrel” (Figure 2) addresses behavioral beliefs and perceived behavioral control of current cyclists, while “Wheel with A View” (Figure 3) promotes safe road sharing and empathy towards cyclists through the constructs of attitude toward the behavior and control beliefs. “Road Rules” (Figure 4) encompasses behavioral beliefs, subjective norm and perceived behavioral control in order to promote bikes as vehicles, safe riding techniques, and efficacy.

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An informal pilot of the designs was conducted to elicit preliminary feedback on the project and guide the final revisions. Invitations to participate were sent via email to twenty-three professional and personal contacts of the author. Feedback was Responses were also received through a dedicated Face Book page, which was publicized through word-of-mouth and the local cycling club. The sample included eight cyclists and four non-cyclists.

A website ([www.recreateyourcommute.com](http://www.recreateyourcommute.com)) was published to provide further information to both cyclists and motorists, as well as support for new commuters. The website includes a survey, which will be used in the future as one facet of the project’s evaluation following the implementation phase.

## 1. 3.0 Results and Discussion

This project resulted in the creation of a research based social marketing campaign designed to promote the use and safety of cycling for transportation as a means to address environmental, health, and transportation issues. While the pilot was based on a small convenience sample, it fulfilled its purpose of obtaining feedback on the designs and guiding revisions, as well as confirming the need for and interest in such a project. Responses to both the project and the designs were overwhelmingly positive, with the exception of two respondents. A sample of the data is listed below in Table 1. A common criticism by respondents was the length of text on many of the signs, which was rectified during final editing. Two of the signs were redesigned because a high percentage of respondents indicated they were confusing.

<insert table 1 here>

Chatzisarantis & Hagger (2005) report persuasive communication as one of the most frequently applied interventions based on the TPB. The use of this type of intervention is supported by the success of social marketing in affecting cultural norms in efforts to change certain behaviors, such as smoking. The most significant limitation of the TPB is the gap between intentions and behavior. How to bridge this gap is the object of much research and consideration across numerous fields (Chatzisarantis & Hagger, 2005; Darker et al., 2010). While the gap is very small for some behaviors, such as texting while driving, it is gaping for other, more complex behaviors, including cycling. This suggests the need to combine educational and promotional campaigns with programming such as workshops and group rides to foster social support, confidence, and skill development. Several studies demonstrate the need to not only generate intentions, but also foster implementation intentions and provide the target population with the assistance and means needed to engage in the new behavior (Chatzisarantis & Hagger, 2005; Darker et al., 2010; Sheeran, Webb, & Gollwitzer, 2005). The Recreate Your Commute project fills this gap in part by including information on overcoming common barriers in many of the sign designs. This is augmented by the website, which not only provides articles and videos on a variety of relevant topics, but also information on local resources, such as classes and groups.

#### **1. 4.0 Conclusions**

Combining the TPB with interpretation techniques provides a framework for increasing the effectiveness of interventions with the goal of creating behavior change. This model is applicable to both educational/promotional media and facilitated programming events, such as interpretive talks, workshops, and special events. Infrastructure, facilities, and policies that discourage the use of private cars and increase the safety of cycling are necessary but insufficient to produce a significant modal shift. People also need skills, strategies for overcoming barriers, social support, confidence, and to feel relatively safe when riding (Gaterslaben & Appleton, 2007; Ojoa et al., 1998; Pucher et al., 1999; Unwin, 1995; Wardman et al., 2007). The Recreate Your Commute project fills this role by targeting the personal and cultural beliefs that determine behavior and engagement. It expands, rather than replaces, current promotional strategies by addressing barriers to participation and social norms, as well as individual beliefs, related to cycling. It also promotes safety by educating motorists in addition to cyclists. While the pilot provides preliminary support, research following implementation is needed to determine the effects and success of this model on cycling for transportation. The authors are currently preparing to implement the project in Norfolk, VA and conduct this research.

Research demonstrates that the majority of Americans believe outdoor recreation not only provides personal and economic benefits, but also plays an important role in addressing issues such as environmental stewardship, underage drinking, illegal drug use, juvenile crime, educational quality, and childhood obesity (Moore & Driver, 2005). Similarly, the power of certain recreation and leisure activities as means of resistance, empowerment and cultural change has been evident throughout history (Ehrenreich, 2006). The application of the TPB, especially in combination with interpretation, has the potential to guide recreation programming and visitor management in order to achieve the above ends. Future research in this area is certainly warranted.

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Figure 1. Graphic representation of the Theory of Planned Behavior (Ajzen, 2006, p.1)

Table 1. Excerpts from the pilot data

<b>Title of sign</b>	<b>What on the sign was striking to you?</b>	<b>How likely would you stop and read it on the spot?</b>	<b>Did it change your perspective or knowledge?</b>	<b>How likely are you to change your behavior after viewing the sign?</b>
Don't Be A Squirrel	The squirrel with tire tracks	Very likely	I didn't know I was supposed to ride on a straight line or why	Definitely will try to ride more predictably
	The road kill!	Very	Makes me think about my role in accident prevention	More sensitive to my own behavior
Gas Pains	The actual costs	Very	Makes me think harder about car	Ride more!
	The illustration	Likely	I like that it encourages small	I walk a lot, so I'm not sure
Park and Ride	The carriers on the bike- f not dorky	Likely	Park and ride always meant b before, not bike	Not assume a biker is anti- Maybe. That's a deep seat stereotype
Choose Your Own P	The top is busy but liked t content	Fairly likely	Tips about how to solve comm problems. Also idea of cyclist through the neighborhood ins speed demon	Start thinking of cyclists as people
No Lycra, No Proble	Cycling in winter	Likely	Lots of tips I didn't know abo	Will read the website
Avoid the Knockout	Confusing title drew my at	Maybe-densely laid out so appealing	Yes, didn't think about turnin problems	Will think about it. Mess clear.