Abstract: This paper presents the proposed theory of facilitated behavior, which is the extension of the theory of planned behavior. The theory adds a new construct within the original theory, in order to take into account the influence of the conditions that facilitate or hinder a person to behave. Consistent with the previous theories of behavioral intention, this theory also hypothesized that the intention is a strong predictor of a behavior.

In the transportation field, this theory is intended to account for the influence of TDM measures on transportation mode choice behavior. TDM measures are essentially an action taken to facilitate or otherwise hinder a person’s behavior in using a mode of transportation, with the aim of influencing the behavior of a person to switch from using private vehicles to using public transports.

In general, this theory provides new insights that are useful for transportation planners and policy makers in transportation.

Keywords: TDM, theories of behavioral intention, theory of facilitated behavior.

1. INTRODUCTION

Any measures taken by transport authorities in managing the movement of people and goods should always refer to how big the demand for transportation that must be served by existing transportation infrastructures. Along with the rapid growth of urbanization, followed by the rapid growth of motorization and also the movement of humans and goods, the availability of transport infrastructure often can not serve the transportation demand sufficiently. As a result, it arises various traffic problems lead to traffic congestion, which has many negative impacts on the environment such as air pollution, noise pollution, wasting fuel and so forth.

Many attempts have been made in the policy-makers to overcome the problems and negative impacts arising from these urban transportation problems. The conventional approach, which
has been used by urban transportation planners and decision makers, is to accommodate any growth in transportation needs in the form of increased capacity and efficiency of the network systems infrastructure. This has been done by building new infrastructures, increasing capacity of existing infrastructure, and increasing the efficiency of infrastructure use with a variety of policy tools of engineering and traffic management. However, this approach is more effective for short time intervals only. In line with the increased need for movement and rapid urbanization, this approach will be felt no longer effective and very difficult to implement from the very large funding requirements.

Any policy of urban transport infrastructure development, using the conventional approach of "predict and provide", should be abandoned and replaced with a new approach that is "predict and prevent." One way that can be done is by managing the transportation demand, known as Transportation Demand Management (Tamin in Kusumantoro et al.).

In principle, the aim of TDM measures is to influence human behavior in choosing modes of transportation, in order to shift the transportation modes, from private cars to a more efficient mode of transportation, such as public transport. This can be done by facilitating the use of efficient modes of transportation, such as public buses (by providing a special bus line, for instance) and/or restricting the use of private vehicles.

One of the success determinant factors for planners and decision makers in setting policies, especially related to transportation issues, such as the application of TDM measures is to understand traveler’s behavior itself, in which he/she plays as the main actors in a transport system. The understanding of how a person's behavior is formed, and the factors that influence and determine the person's behavior is absolutely indispensable.

In connection with that, understanding the determinant factors of mode choice behavior could lead to good insights on the part of planners and decision makers as to how to predict choice and how to influence it through good and appropriate policies. While the transportation community has considerable experience in using rational economic models of decision making in exploring travel choice, there is less study into decision making models from other fields, such as psychology. This paper provides a look at an approach from the field of psychology that adds valuable perspective to understanding behavior.

Fortunately, behavioral intention models have greatly advanced our understanding of such behavioral determinants. These models typically rely on the theory of reasoned action (Fishbein & Ajzen, 1975) and theory of planned behavior (Ajzen, 1991) to explain the fundamental basis of behavior. These models generally state that attitude toward the behavior, subjective norm, and perceived behavior control predict intention and that intention predicts behavior. Impressively, these models have received robust support in numerous behavioral domains (Ajzen, 2001; Eagly & Chaiken, 1993; Sheppard, Hartwick, & Warshaw, 1998) and are considered to be some of the most widely applied theories in social psychology (Greve, 2001).

Behavioral intention models also hypothesize that belief concepts (e.g. behavioral beliefs, normative beliefs, and control beliefs) predict attitudes, subjective norms and perceived
behavioral control (Ajzen & Fishben, 1980; Fishben & Ajzen, 1975). However, even though in some previous studies these behavioral intention models are able to predict behavior, these models don’t take into account the influence of conditions, which facilitate or hinder the behavior.

Thus, the purpose of this paper is to introduce the new construct within the theory of planned behavior, which represents the influence of conditions which will facilitate or hinder the behavior in choosing transportation mode.

2. THEORETICAL BACKGROUND

Since the choice of transportation mode has large effect on society’s consumption of energy, on level of pollution, and on health, there is great value in increasing our understanding of mechanism of choice. While the transportation community has considerable experience in using rational economic models of decision making in mode choice, there is less study into decision-making models from other fields, such as psychology. This paper provides a look at an approach from the field of transportation psychology that adds valuable perspective to understanding behavior.

In the field of psychology, it has been well known some theories of behavioral intention, which include theory of reasoned action and theory of planned behavior. In these theories, intentions are assume to capture the motivational factors that influence a behavior; they are indicators of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance.

The theory of reasoned action (TRA), which was developed by Martin Fishben and Icek Ajzen, was developed to examine the relationship between attitudes and behavior. TRA looks at behavioral intentions rather than attitudes as the main predictors of behavior. According to this theory, attitudes toward a behavior (or more precisely, attitudes toward the expected outcome or result of a behavior) and subjective norms (the influence other people have on a person's attitudes and behavior) are the major predictors of behavioral intention. TRA works most successfully when applied to behaviors that are under a person's volitional control.

The theory of reasoned action was developed as an improvement over information integration theory (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). There are two important changes. First, reasoned actions adds another element in the process of persuasion, behavioral intention. Rather than attempt to predict attitudes, as does information integration theory (and several others), reasoned action is explicitly concerned with behavior. Therefore, reasoned action predicts behavioral intention, a compromise between stopping at attitude predictions and actually predicting behavior. Because it separates behavioral intention from behavior,
reasoned action also discusses the factors that limit the influence of attitudes (or behavioral intention) on behavior.

The second change from Information Integration theory is that reasoned action uses two elements, attitudes and norms (or the expectations of other people), to predict behavioral intent. That is, whenever our attitudes lead us to do one thing but the relevant norms suggest we should do something else, both factors influence our behavioral intent.

Specifically, reasoned action predicts that behavioral intent is created or caused by two factors: our attitudes and our subjective norms. As in Information Integration theory, attitudes have two components. Fishbein and Ajzen call these the evaluation and strength of a belief. The second component influencing behavioral intent, subjective norms, also have two components: normative beliefs (what I think others would want or expect me to do) and motivation to comply (how important it is to me to do what I think others expect).

Another behavioral intention-based theory, which is the extension of theory of reason action is a well known theory of planned behavior. The theory of planned behavior holds that human action is guided by three types of considerations:

- Attitude towards the behavior, refers to an individual’s own evaluation of an action, such as riding transit.
- Subjective norm, refers to an individual’s perception of what others will think if he/she takes an action.
- Perceived behavioral control, refers to an individual’s assessment of his/her own ability to take an action.

Three of these factors contribute to an individual’s intent to carry out of a behavior and will have different importance or weighting depending on the behavior or action.
On the other hand, according to Westaby (2005), behavioral intention theories have not theoretically addressed if or how “reason” concepts provide unique insight into motivational mechanisms. He argues that reason concepts have demonstrated predictive validity in a number of judgement and decision making contexts (Campion, 1991; Permington & Hastie, 1988; Westaby, Versenyi, & Hausmann, 2005, in Westaby (2005)).

The overarching theoretical proposition in behavioral reasoning theory states that reason serve as important linkages between people’s beliefs, global motives (e.g., attitudes towards behavior, subjective norms, and perceived behavior control), intentions, and behavior. Furthermore, the theory assumes that reasons impact global motives and intentions, because they help individuals justify and defend their actions, which promotes and protects their self-worth. Conceptually, the framework also differentiates between global motives and context-specific beliefs and reasons. Global motives are defined in behavioral reasoning theory as broad substantive factors that consistently influence intentions across diverse behavioral domains. Thus attitude, subjective norm, and perceived control are subsumed under this classification, because they are estimated at a broader level of abstraction and have significantly predicted intentions across numerous studies (Ajzen, 2001). This theory is also consistent with the original theorists who often refer to the direct estimates of attitudes, subjective norms, and perceived control as “global” constructs (Ajzen, 1991, p. 191). In contrast to global motives, context-specific beliefs and reasons are contextualized to the specific behavior under investigation (often through elicitation research) and are presumed to serve as the fundamental antecedents of global motives and intentions. Figure 3 provides a visual representation of propositions in behavioral reasoning theory and a brief overview is provided. Consistent with past theory, behavioral reasoning theory hypothesizes that
intentions are powerful predictors of behavior. Furthermore, global motives are expected to predict intentions, in line with past models. As a unique prediction, reasons are expected to predict global motives, presumptively through justification and defense mechanisms. These mechanisms are further expected to allow reasons to directly predict intentions beyond that explained by global motives. However, reasons are not presumed to exist in isolation from people’s beliefs and values. Instead, the reasons people use to influence and sustain their behavior are presumed to result from the processing of their beliefs and values. Direct linkages between beliefs and global motives are also expected because of automated processes that may circumvent deeper reason activation. Finally, behavioral reasoning theory are enacted, in accordance with dissonance theory and may be used to support, distort, or rationalize behavior. Each linkage in the model is considered in turn, starting with the prediction of behavior. This ordering is in line with past theoretical presentations (e.g., Ajzen, 1991; Harrison, 1995)

3. THE THEORY OF FACILITATED BEHAVIOR

3.1 The Rationale
To reduce traffic congestion and environmental problems resulting from motor vehicle emissions, transport policy makers have begun to implement the TDM measures, in which the purpose of TDM measures itself are essentially to influence travel behavior in using transportation modes, in order to use a more efficient modes of transportation, such as public transport.

Quite simply, TDM measures are designed to maximize the people-moving capability of the transportation system by increasing the number of persons in a vehicle, or by influencing the time of, or need to, travel. To accomplish these types of changes, TDM measures must rely on incentives or disincentives to make these shifts in behavior attractive. In other words, TDM measures can be divided into two types of measures, which are incentive measures, aiming at facilitating behavior in using a public transport, and disincentive measures, aiming at hindering behavior in using private car. How TDM measures can affect travel behavior in choosing modes of transportation, will be the subject of our discussion in this paper.
Since we are talking about human behavior, then we have to inevitably involve psychological perspectives to discuss it. There are many behavioral theory developed in the field of psychology. One of them is a well known behavioral intention theory, which includes theory of reasoned action and theory of planned behavior. Those theories developed by Icek Ajzen and Fishben have shown their reability in predicting behavior in many fields including transportation. Unfortunately, the theories do not account for the conditions which facilitate or hinder the behavior in the models. Yet in practice, these conditions will surely have a significant role in influencing a person's behavior.

Furthermore, this paper will discuss the proposed theory of facilitated behavior, which originate from theory of planned behavior, by considering a new construct within the the theory of planned behavior, in order to taking into account the impact of such TDM measures on mode choice behavior. This theory hypothesized that a person would be more likely to behave in particular if there are conditions that facilitate behavior or a person will tend not to perform behavior if there are conditions that hinder such behavior.

3.2 Overview
As in the original theory of planned behavior, the proposed theory of facilitated behavior also hypothesize intention as an antecedent of behavior. While intention itself is determined by four determinat factors. Three of those factors are found in the original theory of planned behavior, which are attitudes towards the behavior, subjective norms and perceived behavioral control. The remaining factor, which distinguishes this theory from previous theories is attitudes towards facilitating behavioral conditions. We will discuss those determinant factors, and their relationships to intention and behavior, as well as the interrelationship between those factors.

Firstly, let us describe the essence of each determinant factors. Francis et al. (2004) defines attitudes towards behavior as a person’s overall evaluation of the behavior. It is assumed to have two components which work together : beliefs about consequences of the behavior (behavioral beliefs) and the corresponding positive or negative judgement about each these features of behavior (outcome evaluations). Whereas subjective norms is defined as person’s own estimate of the social pressure to perform or not perform the target behavior. Subjective norms are assumed to have two components which work in interaction : beliefs about how other people, who may be in some way important to the person, would like them to behave (normative beliefs) and the positive or negative judgement about each belief (motivation to comply). Another factor, which is perceived behavioral control, is defined as the extent to which a person feels able to enact the behavior. It has two aspects : how much a person has control over the behavior and how confident a person feels about being able to perform or not perform the behavior. It is determined by control belief s about the power of both situasional and internal factors to perform the behavior. Finally, attitudes towards behavioral facilitating conditions can be defined as a person’s overall evaluation of the surrounding conditions, whether or not it will facilitate the behavior. It is assumed to have one component : beliefs about facilitating conditions.
The first linkage in theory of facilitated behavior is consistent with previous behavioral intention theories, such as theory of reasoned action (Fishbein & Ajzen, 1975) and theory of planned behavior (Ajzen, 1991), which propose that intention serve as the critical determinants of behavior. Fishbein and Ajzen have defined intention as a “...person’s location on a subjective probability dimension involving a relation between himself and some action” (1975, p. 288). The underlying psychological assumption driving the linkage between intentions and behavior is that most human behavior is under volitional control (Ryan, 1970). Intentions are also hypothesized to mediate the effect of other cognitive, affective, and contextual variables for the prediction of behavior in the previous behavioral intention theories. Thus the effect of such variables on behavior is presumed to be funneled through intentions, which directly drive behavior. This hypothesis has been confirmed in numerous behavioral domains (Ajzen, 2001; Wanberg, Glomb, Song, and Sorenson, 2005).

As we can see on figure 4, the proposed theory of facilitated behavior posit that attitudes towards the behavior, attitudes towards facilitating behavioral conditions, subjective norms and perceived behavioral control are the primary antecedents of intention and mediate the effect of belief concepts. Consistent with previous theory of planned behavior, perceived behavioral control is hypothesized to directly affect the behavior, while affecting behavior
through intention. In addition, the antecedent factors of this intention is also hypothesized to interrelate to each other.

The advantages of the proposed theory of facilitated behavior, compared to the previous theory of planned behavior, is the inclusion of attitude towards behavioral facilitating conditions, aiming to take into account the influence of conditions facilitating the behavior. Since we are discussing about mode choice behavior, then the conditions facilitating the behavior are TDM measures, in which they can facilitate the use of public transport or hinder the use of private car.

4. CONCLUSION

Understanding choice mechanism is very important, especially for transportation planners and policy makers. Many psychological theories has provided a deep insight about human behavior, which are very useful for the development of transportation science.

There is no doubt, that the cause of failure in the transportation policies are because of the ignorance of the role of human beings as subjects in a transportation system. As a result, policies which have been taken often receive no satisfactory response as expected, so that the efforts have been made would seem futile and do not achieve expected results.

The behavioral intentions theories, such as theory of reasoned action and theory of planned behavior, as well as behavioral reasoning theory, have provided a good insights about human behavior and factors affect it. But, as we have a discussion above, they don’t take into account the influence of conditions facilitating or hindering behavior, such as the influence of TDM measures on mode choice behavior. Therefore, as an extention of previous theory of planned behavior, the proposed theory of facilitated behavior tries to accommodate factor concerning the influence of conditions facilitating or hindering behavior, which is not taken into account in the previous theories. However, the proposed theory of facilitated behavior still requires further validity testing through the underway research.

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