Resources, Conservation and Recycling 83 (2014) 141–151

Contents lists available at ScienceDirect

Resources, Conservation and Recycling

journal homepage: www.elsevier.com/locate/resconrec

The role of perceived effectiveness of policy measures in predicting recycling behaviour in Hong Kong

Calvin Wan, Geoffrey Qiping Shen *,[1], Ann Yu [2]

Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong

ARTICLE INFO

Article history:
Received 17 April 2013
Received in revised form
11 December 2013
Accepted 14 December 2013

Keywords:
Recycling
Attitude
Theory of planned behaviour
Policy
Hong Kong

ABSTRACT

Hong Kong is a compact and 'land-hungry' city where recycling has become an important measure for treating waste and reducing the demand on the limited landfills. The objectives of this paper are to extend the model of recycling attitude and behaviour to explain the relationship between perceived policy effectiveness and recycling behaviour. Previous studies on recycling attitude and behaviour had widely adopted the theory of planned behaviour (TPB) and the norm activation model (NAM), and drawn policy implications from them. Nevertheless, little research has been conducted to investigate the role of perceived effectiveness of policy measures in predicting recycling behaviour. To address this, a model that integrates the TPB and NAM was proposed in this study, and a street survey was conducted to investigate the case. The results illustrate that recycling intention is influenced by subjective norms, perceived behavioural control, moral norms, and awareness of consequences, as well as a newly proposed construct, namely perceived policy effectiveness. The study proved self-reported recycling behaviour (direct behaviour) and support for policy measures (indirect behaviour) are influenced by recycling intention. All in all the Government should provide more recycling bins, guidelines on recycling activities, and should accent what it has been doing to facilitate and encourage recycling.

1. Introduction

Waste reduction and recycling are very important elements of the waste management framework in Hong Kong, as well as around the world. They help conserve natural resources and reduce demands for valuable landfill space (Environmental Protection Department, 2010). The Hong Kong Government introduced a campaign in 2005 to enhance the awareness of the importance of recycling. As parts of the campaign, it set up waste-separation facilities and took other action to facilitate recycling, such as running a website to provide the necessary information. The Government has provided around 16,000 sets of waste separation bins in public areas such as roadsides, parks, sports venues, etc. (Information Services Department, 2013). As of 2010, around 1500 housing estates representing about 74% of the local population have joined a domestic waste programme conducted by the Government to provide waste separation facilities (Information Services Department, 2010). However, local environmental groups have voiced the criticism that the waste separation bins were still insufficient and not conveniently located (Sing Tao Daily, 2013).

Despite a slight decline in domestic waste disposal rates since the Government's efforts to reduce waste began (Chung, 2010), Hong Kong's three major landfills are predicted to reach their full capacity in the 21st century. According to government statistics, the annual growth of municipal solid waste from 1996 to 2004 was 3%, while the annual population growth was just 0.9%. Over the past three decades, daily municipal solid waste per capita in Hong Kong increased from 0.97 to 1.27 kg. This implies that each person in Hong Kong had produced 30% more waste than before, posing a heavier burden on landfills (Environment Bureau, 2013). To cope with the enormous growth of municipal solid waste, the Government proposed an expansion of the current three landfills from 270 to 550 ha because they would reach their full capacities by the end of the 2010s. Both environmental groups and local residents criticised the idea because of the potential environmental impacts (Legislative Council, 2013). The expansion of one of the three

* Corresponding author at: c/o SPEED, Room S1201, 12/F, South Tower, PolyU West Kowloon Campus, 9 Hoi Ting Road, Yau Ma Tei, Kowloon, Hong Kong. Tel.: +852 3746 0097; fax: +852 2363 0540.
E-mail addresses: spcalvin@speed-polyu.edu.hk (C. Wan), geoffrey.shen@polyu.edu.hk (G.Q. Shen), ann.yu@polyu.edu.hk (A. Yu).
[1] Address: Department of Building and Real Estate, The Hong Kong Polytechnic, University, Hung Hom, Kowloon, Hong Kong. Tel.: +852 2766 5817; fax: +852 2764 5131.
[2] Address: Department of Building and Real Estate, The Hong Kong Polytechnic, University, Hung Hom, Kowloon, Hong Kong. Tel.: +852 2766 5795; fax: +852 2764 5131.

0921-3449/$ – see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.resconrec.2013.12.009

landfills was eventually shelved by the Government due to strong social opposition. Lawmakers passed a motion to adjourn the debates on funding to enlarge the other two landfills.

In May 2013, a blueprint for the sustainable use of resources in the coming decade was published by the Government (Environment Bureau, 2013). It listed a few facts about Hong Kong:

- Hong Kong holds the highest daily domestic waste generation rate per capita among other Asian cities (including Taipei, Seoul, and Tokyo).
- The current public spending on waste collection, transfer, treatment, and landfilling is HKD 1.4 billion per year.
- 52% of the municipal solid waste is disposed of in landfills.

The Government also targeted to reduce the landfilling rate from 52% to 22% in ten years' time by adopting incineration and increasing recycling, and it has recognised the importance of public participation in related campaigns (Environment Bureau, 2013). So apart from setting up recycling facilities, it has committed itself to recycling by providing more public education.

Policy makers should understand the association between policy measures and the behaviours of the general public to further improve public policies and address public demands. An understanding of public perception of policy effectiveness and its impact on behavioural intentions could shed light on policy formulation. Previous research efforts have studied the causes that influence recycling behaviour (e.g., Oom Do Valle et al., 2005; Sidique et al., 2010; Tonglet et al., 2004). The authors attempted to include additional factors to improve the models' predictive power. Although these studies also described policy implications for changing factors that influenced recycling behaviour, little research has been done on the impact of perceived effectiveness of various policy instruments in relation to encouraging recycling intentions. Wan and Shen (2013) proposed the relevance of perceived policy effectiveness in predicting recycling behaviour, however, the idea was not empirically tested. Little is known about the inclusion of this factor into the TPB and NAM as a predictor of recycling intentions. The objectives of this paper are to extend the model of recycling attitude and behaviour and to explain the role of perceived policy effectiveness in predicting recycling behaviour.

2. Literature review and conceptual framework

2.1. The theory of planned behaviour (TPB)

The theory of reasoned action (TRA; Ajzen and Fishbein, 1980) suggested that an individual's intention to perform a certain behaviour is influenced by attitude and subjective norms. *Attitude* towards behaviour refers to the function of an individual's beliefs towards, and a subjective evaluation of, that behaviour (Fishbein and Ajzen, 1975). *Subjective norms* or social pressure are a function of the perceived expectations by other individuals or groups who are important or close to a person (such as friends, peers, and neighbours), and that person's motivation to comply with these expectations (Fishbein and Ajzen, 1975). The TRA assumes that an individual's behaviour is under volitional control (Tonglet et al., 2004); however, Liska (1984) argued that performing a behaviour may be facilitated or interfered with by other factors, e.g., lack of knowledge, skills, opportunities, etc. The theory of planned behaviour (TPB; Ajzen, 1991) is extended from the TRA by including an additional variable, *perceived behavioural control* (PBC). PBC refers to an individual's perception of his or her ability to perform certain behaviours (Ajzen, 1991). Oom Do Valle et al. (2005) identified two key dimensions of PBC that include external and internal conditions. The external conditions are the ease and convenience of performing a behaviour and the internal conditions are an individual's perceived own abilities including his or her own understanding and knowledge of the behaviour.

Ajzen (1991) proposed that the TPB is a general theory that can be applied in explaining all kinds of social behaviours. The TPB has received considerable attention in the literature and its efficacy in explaining behaviour has been proved (Armitage and Conner, 2001). The TPB has been widely adopted in attitude-behaviour studies, for instance, in the area of technology acceptance (Mathieson, 1991), the dishonest actions of college students (Beck and Ajzen, 1991), smoking (Godin et al., 1992), driving violations (Parker et al., 1992), and the use of public transportation (Heath and Gifford, 2002). Heath and Gifford (2002) described the TPB as a 'parsimonious' theoretical framework that includes major predictors with precise operational definitions of each construct. Tonglet et al. (2004) suggested that the TPB is a systematic framework for identifying predictors of behavioural choices. It has also served as the foundation of studies on recycling behaviour. The TPB proposes that behavioural intention, the antecedents of behaviour, are predicted by attitude, subjective norms, and perceived behavioural control (PBC). Generally, an individual with a more positive attitude, stronger subjective norms, or a higher level of PBC towards a behaviour would register enhanced levels of behavioural intentions. The TPB has been successfully applied in the study of recycling behaviour (e.g., Chen and Tung, 2010; Oom Do Valle et al., 2005; Tonglet et al., 2004).

The following hypotheses are proposed based on the TPB.

Hypothesis 1 (*H1*): Attitude relates positively to recycling intention.
Hypothesis 2 (*H2*): Subjective norms relate positively to recycling intention.
Hypothesis 3 (*H3*): Perceived behavioural control relates positively to recycling intention.

2.2. The norm activation model of altruistic behaviour (NAM)

The norm activation model of altruistic behaviour (NAM) was originally developed for application in the field of pro-social behaviour (Schwartz, 1977). The NAM proposed that behaviour is explained by four key factors: personal norms, social norms, awareness of consequences, and ascription of responsibility. A personal norm can simply be interpreted as the rule that governs an individual in considering if a behaviour is the right thing to do; this is conceptualised as feelings of moral obligation. The impact of social norm influences on individual behaviour is mediated by the personal norms of altruistic behaviour. This relationship was confirmed by the results of Hopper and Nielsen's (1991) and Bratt's (1999) studies on recycling behaviour. In addition, the NAM elaborated that the correlation between personal norms and behaviour is moderated by the awareness of consequences and the ascription of responsibility. Therefore, the relationship between personal norms and behaviour will be stronger if individuals are aware of the consequences, and feel a certain level of responsibility for those consequences.

In a review of the NAM, Thøgersen (1996) suggested that pro-environmental behaviour, unlike the TPB, is not simply based on an individual's cost and benefits analysis, but on a person's moral beliefs. Thøgersen (1996) further suggested that the NAM would offer a more appropriate and reasonable basis for studies on recycling behaviour. Davies et al. (2002) highlighted the importance of the norm internalisation process in understanding recycling behaviour. If an individual performs a new behaviour, social norms would direct an individual's decision to act. The social norms will be internalised and will become personal norms if the behaviour becomes recurrent. Therefore, in performing recycling behaviour, individuals may first be influenced by social norms and