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Using individual householder survey responses to predict household environmental outcomes: The cases of recycling and water conservation

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ABSTRACT

Although individuals' self-reports of behaviour are often used as a proxy for household environmental outcomes, little is known about how accurate they are or what factors might moderate accuracy. The current research investigated this question in relation to household recycling and water use. Results of Study 1 showed a significant, albeit weak, relationship between self-reported household recycling and objective measure of recycling that was not moderated by the number of people in the household. There was some evidence though that the relationship between self-reported and objective household recycling was stronger when respondents perceived more supportive community norms for recycling. The results of Study 2 supported Study 1 in showing a significant but weak relationship between self-reported water conservation behaviour and objective household water use that was again not moderated by the number of people in the house. Similar to Study 1, Study 2 showed that there was a stronger relationship between self-reported and objective behaviour when respondents had more favourable attitudes, more supportive subjective norms, and greater self-efficacy in relation to water conservation. Taken together the research suggests that psychological variables that orient householders to environmental behaviour are more important influences on aligning self-reported behaviour with objective outcomes than knowledge about the behaviour of others in the household.

1. Introduction

Households are significant producers of waste and high consumers of resources through their use of energy and water in the home and indirectly through their broader consumption. Households are therefore an important site for waste recovery and conservation. In light of this, the research focus on understanding and promoting household recycling and resource conservation is not surprising. What is surprising though is that where studies have addressed these issues, they often rely on one individual in the household to provide data on behalf of the household. For example, individual householders often respond to surveys that ask about the amount of household waste that is recycled (e.g., Barr and Gilg, 2005; Hage et al., 2009; Halvorsen, 2012; López-Mosquera et al., 2015; Robinson and Read, 2005; Saphores and Nixon, 2014), or the number of conservation actions performed by household members (Barr et al., 2005; Corral-Verdugo et al., 2008; Sarabia-Sánchez et al., 2014). Although this is no doubt due to the difficulty of obtaining responses from multiple householders, it nevertheless raises the critical question of whether and to what extent individual members of a household can represent the collective household experience. Given that 'household' survey responses are not randomly selected from the household (i.e., the most environmentally interested or time-rich person may respond), the use of individual responses may be far from accurate.

In the current paper we present two studies that address the question of how well individual householders' self-reported behaviour reflects household environmental outcomes. We focus on two important household environmental domains: waste recycling and water conservation. Recycling is a crucial response to rising levels of consumer waste (Hoornweg and Bhada-Tata,

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2012) and with water resources placed under increasing pressure in coming decades (Vörösmarty et al., 2000) water conservation is an essential component to securing long-term water sustainability (Arbués et al., 2003). We test the sufficiency of individual householder responses by examining the relationship between individuals' self-reports of household recycling and water conservation and objective measures of outcomes in these domains. We also explore whether there are variables that moderate this relationship, for example, the number of people in the household, or psychological factors that may influence the alignment between self-reported behaviour and household outcomes.

1.1. Disparities between self-report and objective measures of behaviour

Previous researchers have drawn attention to the potential disconnection between self-reported and observed behaviour. For example, studies have shown disparities between self-reported and observed recycling and re-use behaviour (Corral-Verdugo, 1997; Corral-Verdugo and Figueredo, 1999; McGuire, 1984; Porter et al., 1995), water conservation behaviour (Hamilton, 1985) and energy use (Warriner et al., 1984). Recently, Chao and Lam (2011) explored the validity of self-reported environmental behaviour by comparing them with reports of the same behaviour by observers. They showed significant and moderate correlations between self-reported and observer-reported behaviour. Similarly, Corral-Verdugo and Figueredo (1999) also showed low to moderate correlations between self-reports and observations of householders' re-use of glass, clothing and metal. A meta-analysis of the relationship between self-reported and objective measures of pro-environmental behaviour showed a strong and positive relationship between the measures, although the authors also concluded that 79% of the association in the relationship between self-report and objective measures was unexplained (Kormos and Gifford, 2014).

The focus of previous research comparing self-report and objective measures of environmental behaviour, has predominantly been on individuals' behaviour rather than on the relationship between self-reports and household outcomes. Although one might question the appropriateness of using individual's responses as proxies for overall household behaviour or sentiment, in practice this approach is not uncommon. For example, many studies have relied on the responses of individual householders to examine the predictors of household recycling and resource conservation (e.g., Barr, 2007; Barr and Gilg, 2005; Barr et al., 2005; Hage et al., 2009; Halvorsen, 2012; López-Mosquera et al., 2015; Robinson and Read, 2005; Saphores and Nixon, 2014; Sarabia-Sánchez et al., 2014; Wan et al., 2014) and these studies seem to implicitly suggest that the individual is able to provide accurate and meaningful responses on behalf of the household. As noted above though, past studies suggest a mismatch between self-reported and objective behaviour of individuals, with low to moderate correlations at best.

There are at least two reasons why this mismatch may emerge. One reason advanced by researchers is that self-reports reflect a different perceptual reality to objective measures of behaviour (Corral-Verdugo, 1997; McGuire, 1984). According to McGuire (1984) self-report surveys assess attitudes, ideas, and beliefs about behaviour, and, as such, self-reports may be more reflective of these psychological variables than actual behavioural performance. In support of this notion Gatersleben et al. (2002) showed that attitudinal variables were more closely related to self-reported pro-environmental behaviour than actual household energy use.

A second reason is the ability of an individual to provide accurate data on behalf of the household. If there is low correspondence between self-reported household behaviour and objective household outcomes, a relatively straightforward reason might be that, because individuals do not necessarily have access to the behaviour of all householders, they cannot provide accurate estimates of behaviour on behalf of the household. If this were the case, then the number of people in the household should moderate the relationship between self-reported behaviour and objective household outcomes with a stronger relationship in households with fewer people than in households with more people.

On the other hand, if self-reports of behaviour more accurately reflect a 'psychological' reality that does not necessarily reflect behavioural performance, then the number of people in the household will have little impact on self-reported behaviour. Instead, it may be psychological variables that influence the relationship. In particular, the theory of planned behaviour (Ajzen, 1991) suggests that when people hold more favourable attitudes, perceive more supportive norms, and feel a greater sense of control in relation to a behaviour, this will translate into stronger intentions and subsequent behaviour. Based on this reasoning, it is possible that these three variables may moderate the relationship between self-reported behaviour and household outcomes with a stronger relationship emerging when people have more favourable attitudes, perceive more supportive norms, or have greater perceived control over the behaviour. This moderating effect may emerge because the positive psychological stance towards the behaviour may attune individual householders more to the behaviour of the household and make their judgements of the household's behaviour more accurate. Another possibility is that because householders who report positive attitudes, supportive norms, or higher control in relation to the behaviour will likely have greater commitment to the behaviour, the link between self-reported behaviour and household outcomes will be closer; this may be because either they are the driving force behind the behaviour in the household and/or because they motivate others in the household to engage in the behaviour.

1.2. The current research

In the current research we test two hypotheses based on the reasoning we advance above in the context of household recycling and water conservation behaviours.

Hypothesis 1. Household size will moderate the relationship between self-reported and objective measures of household recycling and water conservation with a stronger relationship between self-reported and objective behaviour in households with fewer rather than more people.

Hypothesis 2. Attitudes, perceived norms, and perceptions of control in relation to household recycling and household water conservation will moderate the relationship between self-reported and objective household recycling and water conservation. Specifically, the relationship will be stronger when respondents have more positive attitudes, perceive more normative support, and/or have greater perceived control. The current research makes an important contribution to the research by moving beyond the focus on individual behaviour to examine pro-environmental behaviour within households, a significant site of environmental impacts. The meta-analysis by Kormos and Gifford (2014) included studies of both individual and household pro-environmental behaviours and explored a set of socio-demographic and methodological variables as potential moderators of the self-report – objective behaviour relationship. Our research differs from that in focusing specifically on household environmental outcomes and the utility of using individual self-reports as proxies for these outcomes. Moreover, it investigates whether the number of people in the household, attitudes, norms, and control moderate the relationship between self-reported and objective household recycling and water