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Information strategy failure: personal interaction success, in urban residential food waste segregation

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ABSTRACT

Direct measurements were taken of residential food waste sorting in a sample from over 5000 communities (5 million households) assigned to a pilot program delivered by government branches in Shanghai which relied on an information strategy for implementation. The results are compared to a population of N = 36 similar communities (36,000 households) assigned to a different program which involved considerable personal interaction. The results show that the information–based program communities did not noticeably sort their waste, whereas those given personal interaction approaches were very successful, with purity rates of 95%(8) and extra costs of about 50 RMB (8 USD) per household. This is a rare direct comparison of two different programs at such large scales, 6–36 months after launch, and suggests that personal interaction approaches should be considered by policy makers. Qualitative key informant interviews yielded data on each program's activities, which provide suggestions for further studies of the underlying behaviour change determinants involved.

1. Introduction

In this paper we would like to challenge the notion that provision of information alone in a non-personal manner has a significant effect on pro-environmental behaviour change. We compare food waste source-separation results of a sample from 5075 communities (containing circa 5 million households) in Shanghai which used a standard government information campaign to those of communities which used more personal interactions.

Governments around the world routinely use information provision as a major element of the implementation of their policies, including those relating to sustainability. A bedrock of practice in public administration is the assumption that the provision of information leads directly to public understanding and thus the embedding of the policy, albeit with varying degrees of effectiveness. Two other routine practices are the use of instruments which affect financial domains of the public (e.g. subsidies, fines, taxes), and legislation (e.g. regulations, enforcement).

The focus on finance, legislation and information stems from traditional economic models based on rational choice which assume that consumers make choices by calculating the costs and benefits to them in each situation, optimizing their own personal gains. Although the assumptions in these models have been deeply challenged in various fields (see Jackson, 2005 for an overview), rational choice approaches remain very popular due to their simplicity, their widespread use by governments, and their foundations in economics which as a subject has historically elicited a remarkable degree of credibility.

Whether concerned with pro-environmental behaviour change or other policies, the policy interventions which follow traditional rational choice models are relatively straightforward: to ensure that consumers have sufficient information to make informed choices, and to make more visible any 'social costs' and government focus areas so that those are taken into account at the same time (Jackson, 2005). In our example in Shanghai to initiate a policy on food waste source segregation, residents were reminded that it is good for the environment, and told to do it. One reason for the popularity of information strategies is how easy they are to carry out (Bator and Cialdini, 2000). However, ease of delivery does not necessarily equate to saving of money or cost-effectiveness (Pope, 1982). Most programs about sustainable behaviour in the 1970's to 1990's focused on information strategies including media advertising and the distribution of printed items (Mckenzie-Mohr, 2000) and different ways of presenting information were trialed,

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but with minimal measurable influence (Hayes and Cone, 1977; Heberlein, 1975; Kohlenberg et al., 1976; Winett and Nietzel, 1975).

Although lack of information and knowledge has been identified to be the main problem of some recycling schemes (NCC, 2003; WCC, 2003, 2004), effective ways of providing it are difficult to find, and there are many documented failures of information strategies (Bickman, 1972; Costanzo et al., 1986; Finger, 1994; Geller et al., 1983; Hirst, 1984; Hirst et al., 1981). More specifically, the most recent IPCC report presents studies that indicate that the provision of information alone, or awareness creation by itself, is unlikely to bring about significant changes in targeted sustainable behaviours (IPCC, 2014 pg 389, including Jackson, 2005; Kollmuss and Agyeman, 2002; van Houwelingen and van Raaij, 1989).

For example, Geller et al. (1983) found no impact on water consumption reduction by delivering booklets that had information about water use and energy use together with the methods of water conservation. A study of the impact of the President of the USA going on television to specifically encourage residents to turn down their thermostats to reduce energy use showed no reduction (although an increase in awareness was seen) (Luyben, 1982). In another study, Geller (1981) indicated that an information based workshop was not effective in facilitating residential energy conservation, despite both knowledge and environmental attitudes increasing.

This evidence points to a gap between rational actor theory and real life: awareness raising does not equate to changed behaviour, and this has been demonstrated by workers from different disciplines such as sociology, sustainability and social marketing (De Young, 1993; Geller et al., 1983; McKenzie-Mohr, 2000; Schultz et al., 1995; Staats et al., 1996).

A meta-analysis was more recently conducted across numerous research publications reporting results of different types of interventions, and concluded that providing information alone could not generally result in promoting behaviour change in energy conservation (Abrahamse et al., 2005). It should be noted that information campaigns have been found to be useful under certain conditions, including when there are no severe external constraints (such as lack of facilities), and when it is convenient and not costly for individuals (Steg and Vlek, 2009). If key information is missing then residents clearly need to obtain it, so it is logical that some studies find it is useful. But the effectiveness of an information campaign is not consistent with the amount of information: more information is not always better, due to it potentially causing feelings of helplessness, and even lack of control (Jackson, 2005; Kaplan, 2000). Levin (1993) proposed that more information could actually raise concerns, as well as feelings of helplessness. New work suggests that information which does not roughly match the values of the recipient can be met with increased resistance (Crompton, 2010). Thus, it is clear that information strategies are not necessarily simple or effective for behaviour change, and may actually be problematic.

It is now generally acknowledged by researchers that other factors have significant influence on such behaviours, such as personal motivation, collective practice, peer pressure, habit, subjective norm, and social context, and that these can cause policy failure if not taken into account. Policy-makers increasingly realize that they need to find policies which support behaviour change via these areas, and not use information alone (NCC, 2003, 2005) and the UK has a government-funded unit dedicated to developing evidence and expertise in this (Eppel et al., 2013).d

With such a large number of studies suggesting that strategies focusing on information are not generally effective for behaviour change, it may be puzzling why they are still used repeatedly by governments around the world. The answer may be that most of those studies focus on academic approaches and interests rather than what is needed for evidence for policy. The academic studies are usually artificial with respect to common practice. What governments need are strategies that are scalable and not difficult to implement. There is a big step from the studies carried out so far, with small samples and sometimes complex interventions showing proof of concept, to city-size demonstrations implemented through chain of command. A recent article in the journal *Science* suggested that there is a need for a swathe of intermediate-scale research, with more concerted efforts by researchers to work in tandem with policy makers and business to do the bridging work needed to translate the insights from behaviour science into scaled interventions which are effective (Allcott and Mullainathan, 2010).

In this work we contribute to that type of study called for – medium-scale and pragmatically driven research on behaviour change interventions – by studying sets of residential gated communities in Shanghai (commonly 500–4000 households each) which have been inducted into the government's food waste source separation program either through standard information strategies or through personal interaction approaches brokered by a non-governmental organization (NGO). We establish through direct measurement of the waste the level of waste separation occurring in the two approaches, and compare the types of implementation activities used in them.

2. Background

2.1. Shanghai's food waste source segregation program of 2011

Over 23 million people live in Shanghai, generating more than 20,000 tons of household waste every day, putting great pressure on waste treatment facilities. Official figures for waste in 2013 indicated that 51% is landfilled, and 23% incinerated, with only around 16% recycled or composted (Shanghai Municipal Environmental Protection Bureau, 2014). This waste generation is expected to keep growing annually due to the urbanization program in China which aims to bring more people to the cities, as well as due to high economic growth (Liu and Wu, 2011), thus resulting in more landfill and incineration facilities (Hoornweg et al., 2005). However, the composition of the household waste in the city is more than 70% food waste (Tai et al., 2011), which causes problems for both landfill and incineration (Chai et al., 2010; Zhang et al., 2008; Zhao et al., 2011). In order to reduce these problems, Shanghai Municipality in 2010 proposed a 5% annual reduction target for waste treated by incineration and landfill, and set up infrastructures such as new pilot collection systems and facilities to support the diversion of food waste from residential waste.

Significant funding was also invested at the level of residential communities. Although it is a metropolis of incredible scale, Shanghai is in fact composed of approximately 24,500 residential communities which are usually informally walled and gated, containing communal gardens and parking, and with dedicated cleaners and gatekeepers. This makes them useful as effective 'laboratories' for experimental studies of various interventions, with potentially transferable knowledge not only about improving residential recycling but also more generalizable behaviour change lessons. The timely introduction of city-wide, city-funded pilot programs across Shanghai made the city an ideal place for research studies: communities and sets of communities can be units of assessment, unlike other cities where boundaries of garbage truck routes and movements of residents and their wastes are not contained.

The number of buildings in a community can vary from just a few up to around a hundred, with modern post-2000 buildings having 30+ floors, 1980–90 buildings having 6–15 floors and the most common, pre-1990 buildings, having 6 floors, typically. The

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