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Justifications and self-organization as determinants of recycling behavior: The case of used batteries

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Abstract

Much previous research on recycling behavior has drawn heavily on models of personal and perceived social norms, as well as of personal attitudes, to explain recycling behavior. Although such models have received empirical support, the issue concerning discrepancies between norms, personal attitudes and an individual's behavior is yet to be resolved. Using battery recycling in Switzerland as a case in point, the present questionnaire-based research examines via regression analyses the relationship between self-reported recycling behavior and socio-demographic variables, attitudes towards ecologically positive waste disposal, trust in waste disposal authorities, specific knowledge concerning recycling, justifications for not participating in the recycling scheme, self-organization of recycling behavior, and level of battery consumption. It was found that recycling knowledge, self-organization of recycling, and disagreement with justifications for non-recycling were positively related to recycling behavior, while attitudes towards ecological waste disposal and trust in waste disposal authorities were not directly related to respondents' self-reported battery recycling behavior. On the basis of these results, with reference to Sykes and Matza's Neutralization theory [Sykes GM, Matza D. Techniques of neutralization: a theory of delinquency. Am Sociol Rev 1957:22(6):664–70] a contextualized model of recycling behavior is proposed. This model is able to account for inconsistencies between personal attitudes and perceived social norms, and has prac-

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tical implications for the design of public intervention strategies for enhancing participation in the recycling.

Keywords: Recycling behavior; Battery recycling; Social norms; Justifications; Neutralization theory; Household's self-organization; Recycling attitudes; Program knowledge

1. Introduction

Waste landfill is related to both the loss of material and energy resources and to landscape deterioration (cf. Price, 2001). Yet two thirds of the total household waste in Europe is still deposited in landfill sites and, as such, is neither recycled nor used for energy generation. This implies a need for policy measures that, for as long as possible, keep products and energy in use between the source and the sink states. The recycling of goods and materials is one possibility by which to reach this goal.

The economic benefit of households' recycling efforts is not unquestioned (Bruvoll et al., 2002). Nevertheless, insofar as new technologies such as pervasive computing (Hilty et al., 2003) or fully automated, high-performance sorting facilities (Kessler, 2004) are not yet available and cost-effective, improvements in sustainable resource management might best be achieved by educating and motivating people to take part in existing recycling schemes. This also holds for the waste fraction of used batteries because the energy consumption and environmental impairments resulting from the recovery of metals from batteries are lower than those corresponding to the recovery of metals from the smelting of ores. In addition, there is a severe risk of long-term pollution due to the process of leaching at landfill sites, occurring when batteries are disposed of together with less hazardous fractions of household waste. The importance of recycling of metals is also apparent from the fact that approximately 10% of the world's total CO_2 emissions are caused by metal production (German Bundesrat, 2003).

In most European nations, less than 30% of municipal waste is recycled. Higher values are reported for the German speaking countries, the Benelux countries, Denmark and Sweden. Switzerland, where the present study was conducted, occupies a leading position within Europe with respect to the recycling of many waste fractions (Jacobsen and Kristoffersen, 2002). As regards batteries, the recycling rates obtained in Switzerland exceed those obtained in battery recycling schemes in, for example, Belgium (54% in 2000), Austria (53% in 2000), Germany (32% in 2000) or the Netherlands (32% in 2000) (EPBA, 2004).

The separate disposal of used batteries at designated collection points is mandatory in Switzerland. This, however, is not strictly enforced. Moreover, the free-of-charge collection of used batteries from any battery consumer is obligatory for any point of sale, something which is more easily enforceable. Battery recycling rates under this scheme have recently increased slightly from 60% in the late 1990s to 66% in 2004 (BUWAL, 2001, 2004; INOBAT, 2005). This increase coincided with a series of activities initiated in 2002 by Interest Organization Battery Disposal—INOBAT (2004a); namely, designing and provid-