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**FINAL REPORT:**

**Between green words and green deeds ...:  
overview of results and practical implications  
(Project HL/DD/24).**

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In the present project, we investigated one very important aspect of sustainable consumption, namely domestic sorting of garbage for separate collection and recycling. For households and individual consumers, sorting waste has higher energy and time costs than non-sustainable ways of garbage disposal. Every citizen experiences a social dilemma, between an easy solution that minimizes personal costs but harms society, and a sustainable solution that is more expensive for oneself but minimizes the societal cost. The government acts as a social marketer with the difficult task of making citizens choose for the collective sustainable interest and against strict self-interest.

To encourage domestic waste sorting, the government can use two types of marketing instruments: communication-instruments and instruments for direct behavioral manipulation. Among the direct instruments to encourage waste sorting are ‘obliging citizens to sort their waste in several waste fractions’ and ‘introducing a pricing system that promotes better waste sorting by making bags for recyclable materials cheap and bags for nonrecyclable rest materials expensive’. Programs that used these direct instruments have been induced in Belgium during the 1990s. By using these mandatory programs, government can achieve a change in behavior without achieving a change in mentality. However, this may cause long-term problems, because mandatory participation to sustainable consumption requires airtight control on citizens’ behavior, which may be unaffordable over time. Moreover, in a democratic order, government policy needs the support of a majority of the population (which is often not the case). Therefore, the government complement carrot and stick approaches with communication-based social marketing, which strives to achieve a real change in mentality of citizens (which is also an explicit objective of Agenda 21 of the United Nations, 1992). To achieve a change in mentality, authorities may use classic advertising channels, but may also use messages that can be posted on product packaging, on garbage containers, etc.

Previous research on waste sorting behavior was solely oriented on evaluating voluntary recycling programs (for an overview see **Part 1**, Smeesters, Warlop, & Vanden Abeele, 1998a). Hitherto, no research has focused on the reality of mandatory programs and some very important questions are still unanswered. In the

present research project, we raised three specific questions: (1) how do citizens experience mandatory recycling programs? (2) which motives underlie people's waste sorting behavior; can we subdivide citizens in different groups with different motives?, and (3) are there any appropriate ways to promote desirable waste sorting behavior? These three important questions structure our research project in three main parts. Our answers to these questions are reported in seven papers, consisting of two 'overview papers' (see Part 1 and Part 6), two qualitative research papers (see Part 2 and Part 3), two quantitative research papers (see Part 4 and Part 5) and one experimental behavioral paper (Part 7). This summary provides an overview of our work and briefly outlines the most important results and implications of our studies. The reader can find a more extensive description of our studies in the respective papers of this research report.

#### **A. How do citizens experience mandatory recycling programs?: qualitative research.**

A first step in our OSTC-research project comprised the creation of a database containing the relevant academic literature on recycling behavior. Based on this literature we wrote a review, summarizing and integrating more than 70 academic papers (see **Part 1**, Smeesters, Warlop, & Vanden Abeele, 1998a). Almost all of that research has been carried out in the context of voluntary recycling programs. There was one general finding common to all these studies, namely that environmental values are people's major motive to sort their domestic waste. This is related to the 'voluntary' character of the investigated recycling programs. It is not really surprising that only citizens for whom ecological goals were salient and important recognized the usefulness of these voluntary recycling programs sorted their domestic waste. Nowadays, recycling programs in Belgium (and increasingly throughout Europe) are mandatory. Consumers are requested to follow the rules of the current recycling programs and to sort their domestic waste in a nonrecyclable waste fraction and into several recyclable waste fractions. Research on domestic waste sorting in a context of mandatory recycling programs is lacking in the academic literature. Our research project was one of the first attempts to study mandatory recycling behavior and we hoped to make a significant contribution to the academic literature on recycling behavior.

Our empirical research started with a qualitative study in which several citizens were asked to tell about their experiences in mandatory recycling programs. We conducted focus groups interviews and individual depth interviews. The results of this study are reported in **Part 2**, Smeesters, Warlop, & Vanden Abeele, 1998b, and also partially in **Part 3**, Smeesters, Warlop, Vanden Abeele, & Ratneshwar, 1999). The analyses of these interviews are based on narrative data of 71 respondents, coming from rural regions (Zoutleeuw), suburban regions (Machelen and Deurne), and urban regions (city of Antwerp). We conducted semi-structured interviews, trying to leave as much room as possible for each respondent to tell his/her story. Afterwards, recycling themes were labeled in all interviews according to the grounded theory approach.

Our results can be summarized into three major themes. One of the central themes in citizens' stories was the habitual nature of their waste sorting behavior. This was especially striking in Zoutleeuw and Machelen where mandatory recycling programs were initiated several years before. In Antwerp, mandatory recycling programs were initiated shortly before we collected our data. Although Antwerp citizens reported more difficulties in their recycling activities compared to citizens in regions where mandatory recycling programs had been operational for several years, most of them had also developed routines in all their waste sorting tasks. As a result of these routines, daily waste sorting activities (like gathering waste, sorting waste, disposing waste) require less problem-solving thinking. Despite the routine nature of waste sorting activities, almost all respondents also reported on practical difficulties (lack of space, odor, insufficient frequency of curbside collecting...), on insufficient recycling information, and on a number of unfair situations (see further). Apparently, our respondents experienced these 'obstacles' as stable over time and had incorporated them in their waste sorting routines. We concluded that domestic waste sorting is a 'habit under pressure'. Citizens develop waste sorting habits, but at the same time are still sensitive for events that may disturb their behavior. Most of these disturbances are only temporarily: they do not affect people's recycling motivations, but they can result in a decrease of people's waste sorting accuracy.

Some of our interviewed respondents in Antwerp lived in city quarters (Schelde left bank, 'Seefhoek') with a lot of garbage problems (littering, waste dumping). Even the Belgian press has been reporting on these issues. In these

quarters we found some incidence of strong negative motivations for participation in mandatory recycling programs: these citizens only sorted their waste in order to avoid fines, and looked for ways to evade the recycling rules. But even in this neighborhood, only a minority had these negative motivations. Most of the other citizens reported positive motivations.

A new factor that has never been reported in the context of voluntary recycling programs is the omnipresence of 'civic duties' in mandatory recycling programs. About half of our respondents thought it is their civic duty to sort their waste accurately. These citizens assume that the government asks them to sort their waste for good (collective benefiting) reasons and they find that every good citizen should take his responsibility. Typically, these 'civic duty' respondents do not spontaneously report environmental reasons to sort their domestic waste. The other half of our respondents did spontaneously report environmental values as their major driving force, and possibly (but not always) civic values as a secondary (but less important) motivation. Obviously, the voluntary participants in our interviews are not necessarily representative for the Belgian population. We will investigate this issue in the second part of our research.

Positive motivations do not imply that people always sort their waste very accurately. Almost all our respondents spontaneously reported events that interfered their self-imposed recycling routines. These events can be categorized into three themes. A first interfering factor is a lack of recycling information. Doubting about where (i.e., in which waste bag) to throw a specific waste fraction may interrupt people's routines. Our respondents clearly indicated that they were not willing to inform themselves better. They do not consider searching for information a personal responsibility; they hold the government and producers responsible. Apparently, their sense of civic duty is restricted to implementing clear instructions that require no further elaboration. A second source of interference is the perception of successful defection by other citizens. Perceiving other people's successful dodging of the rules of the mandatory recycling system might temporarily disturb the personal motivation. Examples are perceptions of illegal waste dumping (in city or suburbs) and waste burning (in rural regions). Our respondents' reactions to these perceptions of defection were often very emotional. Finally, almost everybody evaluates the own recycling system as more difficult and more expensive than the recycling system in

neighboring regions or municipalities. People always pretended to know all the rules of the ‘neighboring’ recycling systems, compared the own system with the neighboring systems, to finally conclude that their own system made them worse off compared to citizens living in the neighboring regions or municipalities.

Implications: The most important implications can be found in the several disturbances of habitual waste sorting behavior. Interviews with communication managers from two garbage collection agencies (e.g., Interleuven , Incovo) indicated that these organisations hope and wish that citizens take their own responsibility in acquiring appropriate knowledge for accurate waste sorting. The agencies consider it as their task to provide citizens with recycling knowledge, which citizens have to learn and memorize. To us this looks like a very optimistic attitude. In our opinion one has to strive for solutions that require less cognitive effort. Several essential changes may help citizens to sort their domestic waste more accurately. Standardization of recycling programs across Belgium can reduce perceptions of unfair situations. The introduction of a coding system (a color code on the packaging that matches an identical color code on the waste bags, e.g., a red code for rest waste, a blue code for PMD-waste) that indicates in which waste bags specific waste fractions have to be thrown may facilitate accurate waste sorting. These changes imply standardization of recycling programs and a commitment by producers to introduce color codes. Both implications appear feasible in the long run.

A second implication is that the government should remove every source of subjectively justifiable infraction (e.g., “if other people burn their waste in the backyard, I am allowed to do that too”). Initiatives like the ‘white tornadoes’ in Antwerp may be very helpful. Littering garbage may be interpreted as a free-for-all and, therefore, litter should be removed as fast as possible. The most important motive for recycling efforts may be the perception of a clean environment. Very few people will be the first to disturb this clean environment.

## **B. Motives/goals underlying citizens' waste sorting behavior and segmentation on basis of these motives/goals**

We found evidence for three qualitatively different motives underlying our respondents' waste sorting behavior, one negative motive (saving money) and two positive motives (civic duty and environmental values). In the second phase of our research we wanted to use more quantitative methods to segment the population in different groups, with groups differing in motivational patterns.

The construction of the second research phase of this research project used the findings of the first phase. We used the narrative data of the first phase to construct 'motivational ladders' (see Laddering research in **Part 3**, Smeesters, Warlop, Vanden Abeele, & Ratneshwar, 1999). We pre-tested these ladders with a sample of administrative and technical personnel of the KULeuven. Later on we also applied a more structured classification technique (HICLAS) (see **Part 4**, Nys, Smeesters & Warlop, 2000).

Laddering searches for maximal variation, and therefore probably overestimates the amount and the importance of motives underlying waste sorting behavior (Cohen & Warlop, 2001). HICLAS searches for maximal overlap between the model and the raw data, and because of that may exaggerate the scope of the underlying motives. Nevertheless, both methods find the same three initial motives: avoiding fines and penalties, civic duty and environmental values.

In the second phase the laddering-elements from **Part 3**, Smeesters, Warlop, Vanden Abeele, & Ratneshwar (1999), were used as statements, e.g., "I sort garbage to fulfill my social duty", or "I want to fulfill my social duty because I want to be a good citizen". These statements were submitted to a sample (N=317) of the Flemish population (+18). Respondents were personally interviewed and were asked to indicate for each statement whether it could be applied to them. Besides the statements, the survey also included several standard scales of relevant personality variables, an extensive self-report of waste sorting behavior, and several socio-demographic variables.

We applied standard data reduction techniques (factor analysis and cluster analysis) to discover our final solution. The best solution for the data reduction problem represents a threefold segmentation (see **Part 5**, Smeesters, Novoseltsev, &

Warlop, 2001). A first group was mostly oriented by environmental values. This group is relatively small (24% of all respondents) but is the most accurate waste sorting group. A priori one might have thought that the ecologically oriented citizens would be younger and higher educated. Somewhat surprisingly, the members of this group are relatively older and lower educated. They have a smaller family load and a relatively high income. A second group (34% of all respondents) is characterized by negative motivations and inaccurate waste sorting. Citizens in this group display a proself value orientation, which means that they are only concerned about their own outcomes and pay no attention to outcomes of others. Members in this group are younger, higher educated and predominantly male. Families in this group are rather small and the available space per family member is rather large. This means that this group's inaccurate waste sorting is not a consequence of practical restrictions. The remaining 42% of respondents formed a third group in our sample. Compared to the other two groups, this group scored medium on waste sorting accuracy and on the several motivational measures. Especially civic duty differentiates this group from the 'proself' group. In our complete sample, we never found any differences between citizens living in rural and urban regions, which is not surprising because it is largely known that socio-demographic characteristics are very weak predictors of recycling behavior.

Implications: Our survey-research confirms but also shades the findings of our qualitative research. We found three qualitatively different groups in terms of psychographic and demographic variables. Most of our predictions were obtained, although not all relations were expected. First of all, we expected citizens in the proself group to be lower educated and short of waste storage space. However, these predictions were not confirmed. Our three different groups were also not localisable in rural or urban regions. This finding hampers the practical use of these segmentation schemes. In order to conduct differentiated campaigns one should be able to distinguish these groups more easily. What remains is a more varied image of different recycling motives than has been found in previous research. In previous research, conducted in the context of voluntary programs, it turned out that primarily environmental values predicted accurate waste sorting. Our research, conducted in the context of mandatory recycling programs, found that also civic duty and punishment-avoidance motives can stimulate citizens to sort their domestic waste.



Together, citizens driven by civic duty or by punishment avoidance constitute about 75% of the population. Both groups of people react, both in their own manner, to the societal requirement to sort waste. Probably only citizens driven by environmental values would sort their waste in a context of voluntary recycling programs. These findings confirm the need for mandatory systems as one of the only possibilities to stimulate everybody to sort their domestic waste. Furthermore, our findings also suggest that, besides ecological themes, civic duty themes should be developed in contemporary recycling communication campaigns.

### C. Subtle influences to promote desirable waste sorting behavior?

In the third phase of our project we investigated the effect of an alternative communication strategy to introduce more sustainable behavior for citizens that have selfish alternatives to behave. The government's role has always been that of an advocate, trying to convince the consumer to take the collective interest into consideration instead of their self-interest. Convictions can only be changed by offering convincing arguments. For example, in April 2001 a traditional TV-campaign tried to make citizens conscious of the negative consequences of not accurately sorting your waste for future generations. In our opinion, we think that this strategy is probably not the best strategy. Reflecting about several behavioral options activates not only the pros of a behavioral option but also the cons, and consequently also the pros and the cons of selfish behavioral options. This strategy may be effective for radical decisions (e.g., deciding to use alternative energy to heat the house). However, we suppose that this strategy may be very ineffective for simple waste sorting behaviors, which have to be carried out several times per day and which occur in a context of time pressure and mental load. Consumers and citizens probably will not extensively consider these decisions, and if they think about them they will probably come up very easily with counter-arguments. The self-interest (e.g., saving money) will always be more salient than the collective sustainable interest.

Therefore, we proposed an alternative, rather subtle form of communication. We assume that most people have knowledge and latent motives at their disposal to behave in a durable manner, although these motives and knowledge do not always become activated. This alternative strategy does not urge citizens to think about arguments but instead uses simple situational cues that may promote durable prosocial behavior. These cues may 'command' habitual decisions, without the consumer actively thinking about these decisions. 'Priming' or subtle activation is capable of activating latent motives, which may be incorporated in the simple decision processes of habitual waste sorting behavior (see **Part 6**, Warlop, Smeesters, & Vanden Abeele, 2000). Practically, this implies placing of simple pro-sustainable messages on packaging, in stores, on garbage containers, ... which do not try to persuade, but instead try to activate some simple concepts in citizens' minds. In a series of four experiments we tested the hypothesis that priming can influence cooperative behavior in a social dilemma. We succeeded to make people behaving more prosocially in prisoner's dilemma game, even

if they were unaware of the influence of simple cues on their behavior (see **Part 7** Smeesters, Warlop, Van Avermaet, Corneille, & Yzerbyt, 2001).

However, we found one group of people for whom this strategy did not work. A classic typology (and accompanying test; Liebrand, 1984) divides the population into people with a 'prosocial' or a 'proself' value orientation. People can also behave very consistent or rather inconsistent with their own value orientation. We found that consistent proselfs acted very selfishly towards prosocial primes. We replicated our findings in several experiments and we could also demonstrate that the effects of primes on behavior are mediated by expectations of other people's cooperative behavior (people that were also involved in the game). Thus, for most citizens the spontaneous expectation that other people will act in a cooperative sustainable manner is a stimulation to behave in the same cooperative sustainable manner. However, the expectation that other people will cooperate stimulates consistent proselfs to free ride on the cooperative efforts of other people. This means that for a limited number of people prosocial communication has a contradictory effect!

Implications: Our experimental results have been obtained in a laboratory setting, using a social dilemma task that only conceptually corresponds to a domestic sorting task. Future research should investigate whether our results are applicable to real-life waste sorting behavior. However, our results are very consistent with the findings in the first two phases of our research project. Our research findings indicated that improvement in accuracy of waste sorting behavior of motivated citizens is possible. Nevertheless, even motivated people make mistakes and even sometimes they prefer the self-interest over the collective durable interest. In some cases, this is inevitable, but in most case we attribute these incidents of suboptimality to thoughtlessness, or to the absence of situational cues capable of promoting prosocial behavior. Using pro-waste sorting cues (e.g., on packaging or on garbage boxes or containers) should realize a stronger consistency in citizen's waste sorting behavior.

However, every form of pro-waste sorting communication is a double-edged knife, and has positive and negative consequences. It has positive consequences for people with a (latent) pro-waste sorting motivation but a small group of consistent proselfs will react against these messages. Our own field research has indicated that about 30% of the population has negative motivations (saving money, avoiding fines). These citizens are characterized by proself value orientations (see **Part 5**, Smeesters,

Novoseltsev, & Warlop, 2001). Probably not all these citizens are consistent prosocials but even a small group of people can disrupt the behavior of larger group of people. Consistent prosocials react very individualistically towards prosocial primes and their selfish behavior can urge other (prosocial) people to also behave in a negative selfish way (a rot apple effect). Our qualitative research has also demonstrated that even cooperative citizens are very sensitive to defective behavior of other citizens in their environment. Some people will try to beat the system (by littering, illegal waste dumping, waste burning, etc...) and their environment will notice that these people's behavior will not be punished. Prosocials are very sensitive to feelings of injustice and may probably react by behaving less prosocially.

If these results can be confirmed for real-life waste sorting behavior, implications are not really optimistic. In social psychology, it is generally known that people may react negatively towards explicit attempts to persuade them. In these cases, people react against the content of the message, and especially if the content of the message does not match their own conviction (as is the case for people with more punishment avoidance motives). Our research indicated that some people might also react very negatively towards subtle messages. Moreover, the findings of our experiments indicated that people's reactions are automatic and mediated by perceptions of an ambiguous environment. At this present moment, our research team is trying to find ways and strategies to eliminate these negative reactions.

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