GUIDELINES TO ENCOURAGE RECYCLING BEHAVIOR IN ITS CURRENT PHASE OF ADVANCED EXPANSION

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ABSTRACT

After a review of the environmental behavior literature, it is clear that the predominant paradigm to conceive environmental behavior proposes that people need to process a large amount of information about ecology and it assumes that recycling is a high involvement desired conduct. Nevertheless, we have highlighted the idea that desired behavior has become a routine or habit with low involvement and then it would seem logical to propose new working strategies to achieve additional recycling performance. To be more specific, new lines of work starting by doing rather than knowing. In addition, we have found that there are some sociodemographic characteristics related with this adoption process, so that these characteristics play a moderating role on the recycling adoption behavior and then they must be considered to encourage recycling in the new situation.

INTRODUCTION

The predominant paradigm to conceive environmental behavior proposes that people need to process a large amount of information about ecology in order to recycle and it assumes that recycling is a high involvement desired conduct (Goldenhar and Connell 1993; Biswas et al. 2000). Thus the task involved in encouraging recycling consists of providing a huge amount of information about both the deterioration of nature and about how to recycle. The aim is thus to develop both cognitive and evaluative elements related to recycling. However, this predominant environmental paradigm framed within a high involvement theory was developed some decades ago, when enthusiasm for recycling probably entailed devoting great effort to voluntary waste collection (Díaz and Beerli 2005). New research works highlights the idea that desired behavior has become a routine or habit with recognized awareness of ecology and recycling, but without a high level of involvement since today's adoption process does not require such effort (Díaz and Beerli 2004). In fact, far from being a novelty, the recycling behavior adoption process is currently not only in an advanced phase of diffusion but today's recycling collecting systems are also highly convenient. This convenience has been favored by EC environmental regulations which have determined the performance of an intensive collective waste recovery infrastructure in many European countries. In fact, glass and paper should be separated levels of 70 percent in 2008 (EC, 94).

Hence, given that the days when recycling behavior was carried out with a very high involvement conduct requiring great cognitive processing effort are long gone and that the recycling situation is far simpler in modern societies, it would seem logical to propose new working strategies to achieve additional recycling performance. As a result, in this context ecological conscience, knowledge about recycling, favorable attitudes toward recycling and ecological concern are sufficiently well developed and the target thus becomes putting into motion the desired conduct. Therefore, what these new strategies might have in common is an emphasis on the centrality of the consistency phenomena by inducing an increase in behavior through the highlighting of existing cognitions and evaluations in the consumer's mind.

On this basis, we set out our first research objective: to develop and estimate the best model whose hierarchy of effect starts by "doing" in order to understand how recycling is adopted through this pattern of conduct. After all, from both the scientific and managerial perspectives, the construction of behavioral models which empirically explain the dynamics of the adoption of recycling behaviors is required (Shrum et al. 1994). In fact, few models within the framework of ecological and recycling literature have been empirically tested with an optimum fit to the data (Jackson et al. 1993).

The second objective of research consists of examining if there are differences to be considered depending on target sociodemographic characteristics. Thus the aim is to discover the most successful strategies to encourage recycling bearing in mind the different kinds of recycling adoption processes which gender, age, education, income, and area of residence profiles might involve.

To this end, we have structured this work in four parts: (1) a review of existing literature; (2) methodological aspects; (3) analysis of results, and (4) conclusions.

REVIEW OF EXISTING LITERATURE

All social marketing campaigns should be designed and planned with a specific behavior in mind (Kotler et al. 2002) and, in many cases, the main barrier to adopting a desired conduct is the fact that the target audience is not contemplating the desired action (Andreasen 1995). Therefore, one effective strategy could consist of bringing recycling behavior to the door; in other words, creating vivid experience of the desired conduct by means of the foot in the door technique for example, or by applying a reward technique such as a lottery or raffle. According to this hierarchy of effects, consumers may have been exposed to a limited amount of information and thus not have formed strong attitudes prior to performing recycling behavior. However, as they progress in recycling activities, they become increasingly involved and gather more and more information. In the context of recycling, it would seem logical to assume that this approach could be effective since the behavior is limited in scope and is of a convenient nature. Yet while conative approaches are both interesting and make sense in marketing terms, not a great deal of research has been carried out to date to identify how they might succeed (Sheth et al. 1999).

Based on marketing literature and considering the attitude framework of tripartite components, there are two possible hierarchies of effects with the behavioral component, namely (1) "do/know/feel," which does not have a theoretical social marketing background but is recognized as a low involvement behavior in advertising efficacy literature (Vaughn 1986) and (2) "do/feel/know" which is widely acknowledged in social marketing literature to generate a high desired conduct involvement (Kotler and Roberto 1992). In any case, there exist two consumer behaviors doctrinal constructs that are valuable to give more insight into any conative influencing strategy: one is cognitive dissonance, the other is behavior modification.

Cognitive dissonance stresses the idea that individuals seek to maximize the psychological consistency between their cognitions and behaviors since inconsistency is taken to be an uncomfortable state, and hence persons are seen as striving to avoid it. Therefore, it is said to be a post-decisional phenomenon since dissonance arises after the decision has been taken and the behavior carried out. Furthermore, it may be useful to mention that there are a number of alternatives to the cognitive dissonance theory which emphasizes the centrality of the concept of self to contradiction phenomena. These alternative theories are the hypocrisy induction theory (Fried 1998) and the self-perception theory (Bem 1972) which are valuable for explaining low commitment responses.

The hypocrisy induction theory claims that on occasion a persuader's task is not so much to encourage people to adopt the desired attitudes as it is to encourage people to act on existing attitudes. In fact, people very rarely express negative attitudes toward recycling since recycling is an intrinsic part of modern culture and a very common form of conduct even though they personally might fail to act accordingly. Based on the hypocrisy induction mechanisms, presumably the underlying mechanism arisen from the conative strategies involves the salience of this kind of attitude behavior inconsistency. In this sense, the self-affirmation theory (Steel 1988) points out the significance of maintaining an image of the self as morally adequate, competent, coherent and good; in other words, with some perception of self-integrity.

In addition, both the self-perception theory and the attribution theory (Weiner 2000) provide alternative explanations of dissonance effects but coincide in stating that once behavior has appeared the cognitive and affective components of attitude fall into the same line by inferring that was acted before; in other words, by wondering why to recycle, what to recycle and so on.

The other approach consists of the behavior modification doctrines, which argue that a great deal of behavior is influenced by environmental factors which appear both before (for example, a promotional intervention) and after (for example, the reward to the conscience in accomplishing) the desired conduct. In this context and according to the doctrine of instrumental learning (Carey et al. 1976), any external or internal rewards are non-conditional stimuli which, after being associated with the appearance of the desired response, serve to reinforce it, up to the point that, in the absence of such stimuli, a recycling behavior becomes more probable. In short, behavioral theorists urge social marketers to pay close attention to the rewards that can affect desired behaviors (Andreasen 1995).

Both the cognitive dissonance and behavior modification doctrine not only justify a process of adoption other than that of the consistency principles, but also explain the consolidation of beliefs and attitudes in accordance with the indirect effects that result from the previous appearance of the behavior (Eagly et al. 1994).

In view of all of this, we put forward two initial alternative hypotheses:

H1a: The model with "do-know-feel" hierarchy of effect can represent the recycling behavior adoption process.

H1b: The model with "do-feel-know" hierarchy of effect can represent the recycling behavior adoption process.

On the other hand, in environmental and recycling literature it is emphasized that sociodemographic characteristics are discriminating variables in terms of recycling behavior. (Pickett et al. 1993; Gamba and Oskamp 1994). More specifically, age, sex, educational level, income bracket, and area of residence are the sociodemographic factors which have proved to be most closely associated with the recycling model (Tracy and Oskamp 1983; Shrum et al. 1994; Hornik et al. 1995), for which reason they systematically affect the cause and effect relationships established between the cognitive, evaluation and behavior variables specified in the recycling adoption model. It is this same association which, according to Berger and Corbin (1992) leads us to the conclusion that sociodemographic factors have a moderating effect on the recycling adoption process of consumers, in such a way that the resulting relationships between the variables of the model alter in intensity or display a new type of structure.

With respect to age, the earliest research into recycling revealed a negative correlation, in that younger people had a greater tendency to recycle (Buttel 1979; Van Liere and Dunlap 1980); in contrast to this, the most recent studies have identified a positive correlation, in that it is the older people who appear to be more committed recycling (Vining and Ebreo 1990). These differences are probably due to the fact that recycling is no longer regarded as an innovatory mode of behavior belonging to youngsters but has become socially generalized (Van Liere and Dunlap 1980). Furthermore, it is also argued that if since the nineties the separation of waste in the home has tended to be carried out by older people this is because the convenience of the selective waste collection system has superceded any inhibiting factors which used to face older people (Scholder 1994; Shrum et al. 1994). Upon this basis we put forward our second hypothesis:

H2: Consumers' recycling adoption models vary according to the sociodemographic factor of age.

Gender has also been identified as a variable associated with environmentally responsible behavior and recycling, and evidence of this can be found in a number of studies (Blocker and Eckberg 1989; Byrd et al. 1989; Mainieri et al. 1997), all of which coincide in the greater disposition of females to recycle. As a result, we formulate the following hypothesis:

H3: Consumers' recycling adoption models vary according to the sociodemographic factor of gender.

Educational level is another sociodemographic factor associated with environmentally friendly behavior in general, and with recycling in particular, in that individuals with higher educational levels have a greater disposition toward waste recycling (Sundeen 1988; Scholder 1994). This evidence is based on the fact that more highly educated individuals are generally speaking more aware of environmental issues (Scholder 1994). We thus propose a third hypothesis:

H4: Consumers' recycling adoption models vary according to the sociodemographic factor of educational level.

Similarly, income levels have been one of the most closely studied sociodemographic variables in literature related to environmentally friendly behavior, and most of the studies which we have analyzed have concluded that there exists a statistically positive and significant association between income and recycling (Vining and Ebreo 1990; Oskamp et al. 1991; Scholder 1994). From a theoretical perspective this evidence is based on: (1) recycling infrastructure is more developed and thus more convenient in high income suburbs and in more spacious private (Berger 1997); (2) social structuring obeys a Maslow-type pyramidal pattern where individuals on a lower income are more concerned to satisfy their basic needs, while people with higher incomes are more orientated toward matters of a higher order such as the protection of nature (Van Liere and Dunlap 1980); (3) individuals with higher incomes have a greater capacity to consume and thus potentially generate more trash and hence recycle more and finally, (4) there exist correlations between income, educational levels and age. (Shrum et al. 1994; Scholder 1994). Upon this basis we propose the following hypothesis

H5: Consumers' recycling adoption models vary according to the sociodemographic factor of level of income.

Finally, it has been sufficiently well demonstrated that the area in which a given family resides determines the probability of recycling; by area we refer to the distinction between urban versus rural areas. According to Berger (1997) residents in urban or metropolitan areas display the highest tendency to recycle, in contrast with country dwellers. This is due to (1) in cities there are far more recycling facilities that in rural areas (Berger 1997) and

(2) city residents are more exposed to environmental problems which makes them more disposed to collaborate with recycling; while country dwellers have a more utilitarian attitude toward nature, which makes them more insensitive toward its deterioration (Van Liere y Dunlap 1980). In consequence we put forward the following hypothesis:

H6: Consumers' recycling adoption models vary according to the sociodemographic factor of their area of residence.

SOME METHODOLOGICAL ASPECTS

A questionnaire was used to gather information about cognitive and evaluation aspects, together with sociodemographic characteristics. Recycling behavior was also measured using this survey. In this case, recycling behavior was defined in relation to three different materials: glass, paper, and tetra-bricks containers. The sample was selected following a convenience procedure and, after eliminating four entries for various reasons, this work used a final sample of 246 individuals. The survey took place in January 2004 (see Table 1).

The measuring scales relative to ecological conscience (Bohlen et al. 1993), beliefs about recycling (Scholder 1994) and ecological concern (Biswas et al. 2000) are of the Likert type, with over four items and five points. Attitude toward recycling (Shrum et al. 1994) and recycling involvement (Zaichkowsky 1985) are semantic differential, four items and five points. Although all these psychographic scales were based on the literature, they were redrawn by means of developing a qualitative research procedure: brainstorming methods and in-depth interviews. Regarding sociodemographic characteristics, the measuring scales relative to age, income and education are of the Likert type, with one item and five points. Gender and area of residence are dichotic scales.

ANALYSIS OF RESULTS

Prior to testing the hypotheses, we checked the validity and reliability of the measuring instruments by means of exploratory factorial, Cronbach's alpha and confirmatory factorial analyses on the cognitive components and the evaluative, ecological and recycling components. Consequently, it can be said that the scales for ecological conscience, recycling beliefs, recycling attitude and involvement show values that indicate the reliability and validity of the dimensions under consideration, except for the extracted variance of ecological concern, which was below the critical threshold of 0.5 (see Table 2). Finally, and in order to check the discriminatory validity of the measuring instruments, a correlations analysis was conducted which demonstrated that ecological conscience, recycling beliefs, ecological concern, recycling attitude and recycling involvement measure different ecological and recycling realities, with Pearson's correlation coefficient far below one.

Before carrying out the statistical analysis to select the best recycling model, we obtained a frequency analysis. The first remarkable feature of the results obtained is the evidence that the variables defined as ecological concern (2.1) and conscience (2.2), are mid-scale score, much

TABLE 1
The Sample Frequencies

	GENDER				
	Male	**Female**			
Percent	40.7%	59.3%			
	AGE				
	18–23	**24–30**	**31–45**	**46–60**	**>60**
Percent	15.9%	17.9%	18.7%	37.0%	10.6%
	LEVEL OF EDUCATION				
	Without	**Primary**	**Secondary**	**Colleges**	**University**
Percent	7.3%	34.1%	35.8%	12.2%	10.6%

TABLE 2

Confirmatory Factorial Analysis on Measuring Instrument: Weight Factor, Standardized Estimator, Non Standardized Estimator, Variance and Critical Ratio

ECOLOGICAL CONSCIENCE

Items of Ecological conscience scale	F.	S.E.	N S.E.	S.	C.R.
I know what the main ecological problems are.	0.822	0.74	0.91	0.06	13.23
In general, I know how not to damage the ecosystem.	0.859	0.79	0.97	0.06	14.50
I sufficiently understand what is said about the deterioration of nature.	0.894	0.87	1.00		
In general, I can distinguish what is bad and what is good for the natural environment.	0.851	0.79	0.81	0.05	14.46

Ex. V. 73,40%; KMO: 0.827; Bartlett: 508.387; Sig. 0.000

Chi: 3.145; df: 2; $p > 0.208$
GFI: 0.99; RMSEA: 0.048
AGFI: 0.97; NFI: 0.99; RFI:0.98; IFI: 0.99; TLI: 0.99; CFI: 0.99; CMIN/DF: 1.57; PGFI: 0.19; PNFI: 0.33

Compound Reliability: 0.8895;
Extracted variance: 0.6689;
Cronbach's alpha: 0.8766

BELIEFS ABOUT RECYCLING

Items of Beliefs about recycling scale	F.	S.E.	N S.E.	S.	C.R.
I know how to recycle.	0.714	0.65	1.16	0.16	7.03
I know more about recycling than the average person.	0.776	0.54	0.85	0.10	8.36
I know what materials can be recycled.	0.819	0.62	1.00		
I know the reasons why recycling is promoted.	0.773	0.76	1.21	0.17	6.88

Ex.V. 59.491%; KMO: 0.730; Bartlett: 266.171 Sig. 0.000

Chi: 0.479; df. 1; $p > 0.489$
GFI: 1.00; RMSEA: 0.000
AGFI: 0.99; NFI: 1.00; RFI: 1.00; IFI: 1.00.; TLI: 1.01; CFI: 1.00; CMIN/DF: 0.479; PGFI: 0.10; PNFI: 0.16

Compound Reliability: 0.8895;
Extracted variance: 0.6689;
Cronbach's alpha: 0.8766

ECOLOGICAL CONCERN

Items of Ecological concern scale	F.	S.E.	N S.E.	S.	C.R.
When man interferes with nature, it often leads to disastrous consequences.	0.732	0.63	1.15	0.17	6.61
Mankind is severely abusing the environment.	0.793	0.75	1.00		
The balance of nature is very delicate and can change very easily.	0.652	0.47	0.76	0.13	5.62
If things continue as they are, we will experience a great ecological catastrophe.	0.688	0.51	0.88	0.14	5.96

Ex. V. 51.582%KMO: 0.705 Bartlett: 157.077 Sig. 0.000

Chi : 5.426; df: 2; $p > 0.066$
GFI: 0.99; RMSEA: 0.084
AGFI: 0.94; NFI: 0.97; RFI:0.90; IFI: 0.98; TLI: 0.93; CFI: 0.98; CMIN/DF: 2.71; PGFI: 0.19; PNFI: 0.32

Compound Reliability: 0.8895;
Extracted variance: 0.6689;
Cronbach's alpha: 0.8766

ATTITUDE TOWARD RECYCLING

Items of Attitude toward recycling	F.	S.E.	N S.E.	S.	C.R.
Bad / Good	0.862	0.75	0.87	0.05	15.58
Stupid / Wise	0.913	0.84	0.84	0.04	19.88
Undesirable / Desirable	0.920	0.91	0.92	0.03	23.99
Not valuable / Very valuable	0.931	0.94	1.00		

Ex. V. 82.231%KMO: 0.832 Bartlett: 815.175 Sig. 0.000

Chi: 0.617; df: 1; $p > 0.432$
GFI: 1.00; RMSEA: 0.00
AGFI: 0.99; NFI: 1.00; RFI:0.99; IFI: 1.00; TLI: 1.00; CFI: 1.00; CMIN/DF: 0.61; PGFI: 0.10; PNFI: 0.17

Compound Reliability: 0.8895;
Extracted variance: 0.6689;
Cronbach's alpha: 0.8766

INVOLVEMENT WITH RECYCLING

Items of Involvement with recycling	F.	S.E.	NS.E.	S.	C.R.
It means nothing to me / It means a lot to me	0.843	0.70	0.85	0.05	15.69
It is not in my interest / It is in my interest	0.845	0.79	0.90	0.06	14.70
I am not interested / I am interested	0.918	0.84	1.00		
It is not my responsibility / It is my responsibility	0.905	0.92	1.04	0.06	16.78

Ex. V. 77.203%KMO: 0.805 Bartlett: 648.973 Sig. 0.000

Chi: 0.556; df: 1; $p > 0.456$
GFI: 0.99; RMSA: 0.00
AGFI: 0.99; NFI: 0.99; RFI:0.99; IFI: 1.00; TLI: 1.00; CFI: 1.00; CMIN/DF: 0.55; PGFI: 0.10; PNFI: 0.16

Compound Reability: 0.8895;
Extracted variance: 0.6689;
Cronbach alfa: 0.8766

lower than the maximum of five. This contradicts the predominant understanding about recycling in environmental literature since recycling is not motivated by a very high commitment with a robust ecological ideology. Thus, as mentioned in the literature review, recycling appears be a solid part of our contemporary culture, i.e., a routine without any radical connotations (Vining and Ebreo 1990). In fact, the means score obtained for the involvement with recycling variable was little over mid-scale and far from the top (2.9).

Analysis of Model Selection

With the aim of developing the model that best represents the recycling behavior adoption process in every hierarchy of effects, two phases were followed: theoretical development and estimation. Theoretically, two types of conative models have been considered. In line with Gerbing and Anderson (1988), the estimation phase must consist of the estimation of various alternative models in order to make comparisons that lead to the choice of the optimum option, which constitutes the definitive model. In order to simplify the task, and since the separation/recycling systems for glass, paper or cardboard and tetra-brick containers are implemented in similar ways, the variable of recycling behavior was standardized by means of an arithmetic average. The next step was the selection of the model showing the best fit to the data in the previously mentioned categories of effect hierarchy by examining the measures of goodness of fit. As can be seen in Figure 1, although both models show a good fit to the data, the "do-know-feel" hierarchy of effect is much better (*Chi squared*: 0.002; d.f. 1; $p > 0.962$) than the "do-feel-know" hierarchy of effect (*Chi squared*: 0.208; d.f. 1; $p > 0.648$). In addition to this and with the aim of checking if the best conative model was better adjusted than the best classic model (know-feel-do), we made a comparison of the measures of goodness of fit of both models. As a result, it can be concluded that the best classic model (*Chi squared*: 0.034; d.f. 1; $p > 0.853$) is discarded since the best conative model shows a much better fit to the data. Therefore, the conative model defined by the "do-know-feel" hierarchy of effect is considered as the final selection.

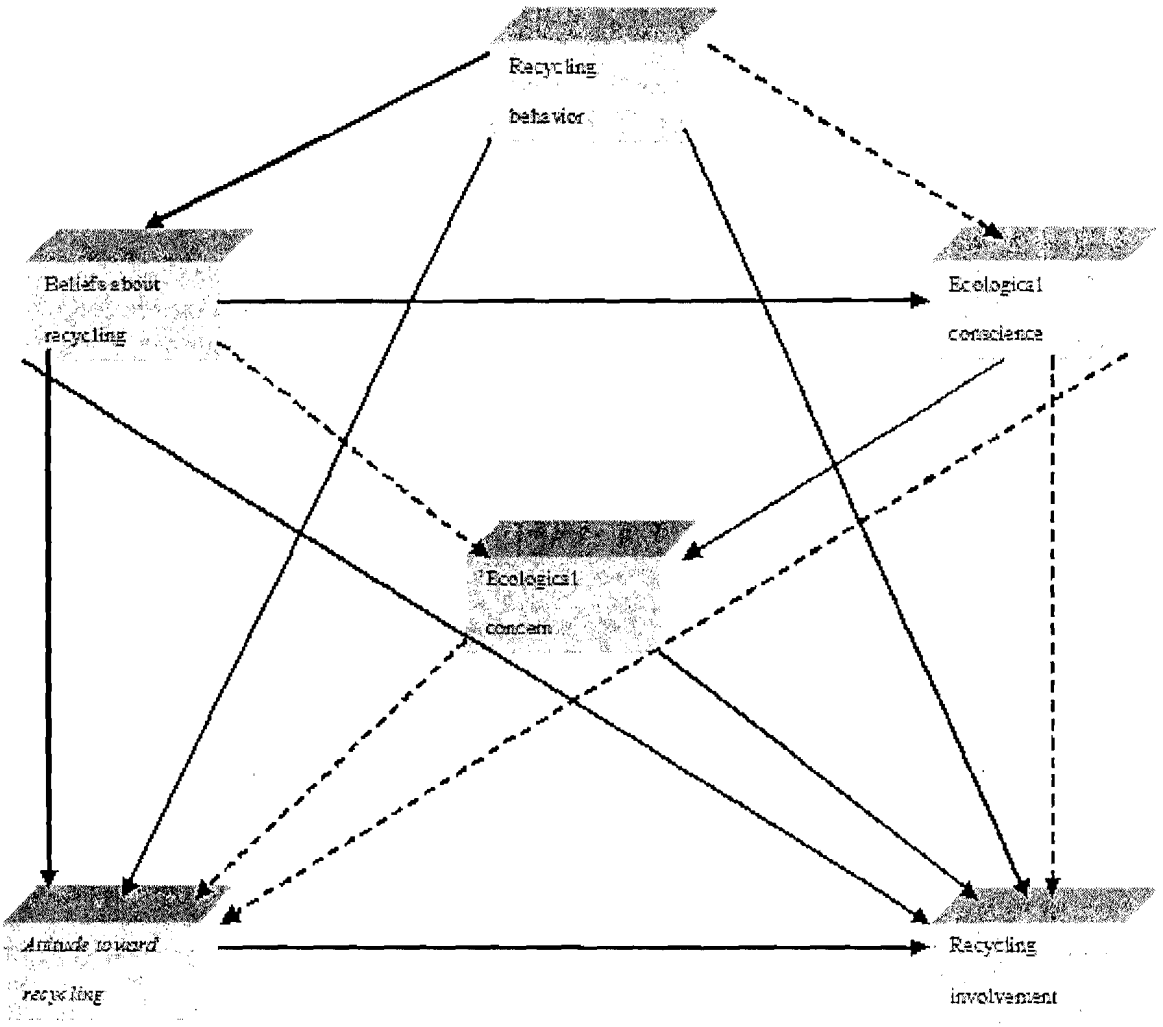
After the selection of the final model, a detailed examination of the critical ratios and standardized estimators of the best model was performed. Thus, this model suggests the most adequate way in which recycling behavior might be achieved. The "do-know-feel" adoption model is illustrated in Figure 1 and, based on the self-perception theory (Bem 1972) and the attributional theory (Weiner 2000), it deals with the fact that recycling behavior can be stimulated directly assuming that people use observations of their own behavior to realize what their attitudes could be. In this case and according to the hypocrisy induction theory (Fried 1998), an environmental policy maker's task is not so much to encourage people to have the desired attitudes as to encourage them to act on existing principles. In fact, recycling behavior, beliefs about recycling and ecological conscience are very accepted in society, which considers them desirable aspects. For this reason, once the consumer adopts the desired behavior, then he/she easily feels a favorable attitude toward recycling and at least some sense of involvement with recycling. According to the doctrine of instrumental learning recycling behavior becomes a rewarding habit without any internal and external inconsistency given that there is ecological conscience in the individual and in society and it reinforces the maintenance of the desired conduct intrinsically and extrinsically, respectively.

Examining the structural model, the point is that the desired conduct and beliefs about recycling can both set the development of ecological conscience in motion. However, as ecological conscience draws a path toward ecological concern and this feeling of disquiet about nature leads to recycling involvement, it seems logical to assume that ecological conscience offers a clear opportunity to increase the level of involvement with recycling thus ensuring the maintenance of the desired conduct as a habit. Furthermore, given that ecological concern plays an important role in accomplishing the objective of involvement with recycling, it would seem reasonable to assume that the recycling behavior will have a low level of attachment as long as the process is mediated by this feeling of unease about environmental deterioration or fear appeal and there is not a direct connection between behavior and ecological conscience.

Additionally, beliefs about recycling are a key variable both to form a habit without an ecological antecedent and to achieve a habit with some degree of ecological conscience and ecological concern. For this reason, social marketers should ensure that consumers acquire some beliefs about recycling since they form the basis of the performance both of ecological components with respect to both ecological conscience and ecological concern and of recycling components with respect to both attitude toward recycling and involvement with recycling.

On the basis of these results and considering that the model with a "do-know-feel" hierarchy of effect shows good adjustment, hypothesis 1a as well as hypothesis 1b fail to reject.

FIGURE 1
"Do-Know-Feel" Model of Recycling Behavior



STANDARDISED ESTIMATOR AND CRITICAL RATIOS

Behavior → Beliefs about recycling (SE:0.43; CR:7.65); Beliefs about recycling → ecological conscience (SE:0.52;C.R.:9.04); Behavior → ecological conscience (SE:0.09;CR:1.68); Beliefs about recycling → ecological concern (SE:0.03;CR:0.53); Ecological conscience → ecological concern (SE:0.32;CR:4.52); Behavior → attitude toward recycling (SE:0.54;CR:9.75); Beliefs about recycling → attitude toward recycling (SE:0.17;CR:2.78); Ecological concern → attitude toward recycling (SE:0.07;CR:1.32); Ecological conscience → attitude toward recycling (SE:-0.05; CR:-0.79); Behavior → involvement (SE:0.27;CR: 4.03); Attitude toward recycling → involvement (SE:0.17;CR:2.61); Ecological conscience → involvement (SE:0.07;CR:1.17); Ecological concern → involvement (SE:0.11;CR:1.98); Beliefs about recycling → involvement (SE:0.17;CR:2.63)

INDICATORS OF GOODNESS OF FIT

Chi squared: 0.002; d.f. 1; $p > 0.962$;GFI: 1.00; RMSEA: 0.000;AGFI: 1.00; NFI: 1.00 ; RFI:1.00; IFI: 1.00; TLI: 1.03; CFI: 1.00;CMIN/DF: 0.002; ECVI:0.163; PNFI:0.067; PGFI:0.048; AIC:40.002

Exploratory Analysis of Moderating Characteristics

In order to explore the moderating role of the sociodemographic characteristics in the selected conative model explaining consumer recycling behavior, we performed a multi-group analysis taking into account the sociodemographic traits of gender, age, education, income, and area of residence. According to the results there are significant differences in the level of age (CMIN: 34.309; d.f. 14; $p < 0.00$), education (CMIN: 21.798; d.f. 14; $p > 0.09$) and area of residence (CMIN: 46.027; d.f. 14; $p < 0.00$), with a reliability of 90 percent (see Table 4). In addition to this, although there are no significant differences for income (CMIN: 8.593; d.f. 14; $p > 0.88$) and gender (CMIN: 16.974; d.f. 14; $p > 0.54$) we have found significant differences at the level of one parameter of relationship for each of the two characteristics (see Table 3).

The examination of the critical ratios and standardized estimators of the multi-group analysis allows us to draw conclusions about the type of relationships according to the level of each of the characteristics (see Table 4). Starting with the gender characteristic, the ecological conscience influence on ecological concern is lower in females than males. On that basis, I fail to reject Hypothesis H2, which states that *consumers' recycling adoption models vary according to the sociodemographic factor of gender.*

There are five main differences with respect to the age characteristic. Firstly, recycling behavior influences be-

TABLE 3
Chi Squared Analyses of Differences by the Multi-Group Procedure for Sociodemographic Characteristics

The model without restrictions and each of the models with an established restriction of equality of parameters of regression in the groups with a higher or lower level of each of the sociodemographic characteristics.	*Gender*		*Age*		*Education*		*Income*		*Residence Area*	
	CMIN	*p*	*CMIN*	*p*	*CMIN*	*p*	*CMIN*	*p*	*CMIN*	*p*
Recycling behavior → Beliefs about recycling	0.77	0.67	7.88	0.00	0.85	0.65	2.89	0.09	1.9	0.34
Beliefs about recycling → Ecological conscience	0.17	0.86	1.76	0.38	5.44	0.02	0.11	0.87	1.55	0.44
Recycling behavior → Ecological conscience	0.00	0.97	0.07	0.88	0.27	0.82	0.44	0.77	0.21	0.84
Beliefs about recycling → Ecological concern	1.41	0.48	4.63	0.03	0.46	0.77	0.22	0.84	0.51	0.75
Ecological conscience → Ecological concern	9.54	0.00	4.45	0.03	3.02	0.08	1.95	0.32	0.10	0.87
Recycling behavior → Attitude toward recycling	1.05	0.59	1.20	0.55	0.03	0.90	1.18	0.55	7.01	0.00
Beliefs about recycling → Attitude toward recycling	0.00	0.97	0.04	0.89	0.11	0.87	0.21	0.82	1.48	0.46
Ecological concern → Attitude toward recycling	0.22	0.84	0.03	0.89	1.4	0.48	0.60	0.73	0.15	0.86
Ecological conscience → Attitude toward recycling	0.01	0.91	2.81	0.09	0.04	0.89	1.95	0.32	3.33	0.07
Recycling behavior → Involvement with recycling	0.02	0.89	0.35	0.80	5.30	0.02	0.00	0.97	10.00	0.00
Attitude toward recycling → Involvement with recycling	0.00	0.95	0.12	0.87	0.00	0.97	0.22	0.84	17.13	0.00
Ecological conscience → Involvement with recycling	0.10	0.87	2.25	0.23	3.019	0.07	0.01	0.91	0.20	0.84
Ecological concern → involvement with recycling	1.95	0.32	0.16	0.86	0.10	0.87	0.22	0.84	5.77	0.01
Beliefs about recycling → *involvement with recycling*	1.54	0.44	8.88	0.00	0.00	0.95	0.05	0.89	1.22	0.54
- Equality of all regression coefficient	16.97	0.54	34.30	0.00	21.79	0.09	8.59	0.88	46.11	0.00
- Equality of all regression coefficients, except in significant parameters	8.31	0.89	6.66	0.80	3.49	0.96	5.7	0.95	10.84	0.28

TABLE 4
Comparison of Critical Ratios and Standardized Estimators from a Multi-Groups Analysis Considering Sociodemographic Characteristics

	Gender				Age				Education				Income				Area of Residence			
	Male		Female		Less		More		Less		More		Less		More		Urban		Rural	
	SE	CR	SE	CR	SE	CR	SE	CR	SE	CR	SE	CR	SE	CR	SE	CR	SE	CR	SE	CR
1	0.40	8.22	0.49	8.22	0.17	1.61	0.57	7.50	0.47	6.34	0.41	6.34	0.50	5.71	0.20	1.55	0.42	8.02	0.60	8.02
2	0.54	9.06	0.52	9.06	0.48	7.57	0.49	7.57	0.64	8.00	0.45	3.69	0.47	6.33	0.47	6.33	0.53	8.96	0.50	8.96
3	0.07	1.47	0.09	1.47	0.13	2.09	0.14	2.09	0.07	1.04	0.07	1.04	0.13	1.70	0.11	1.70	0.08	1.43	0.10	1.43
4	0.04	0.58	0.04	0.58	-0.08	-0.72	0.27	2.63	0.06	0.70	0.06	0.70	-0.04	-0.52	-0.04	-0.52	0.05	0.73	0.06	0.73
5	0.51	5.41	0.18	2.03	0.46	4.00	0.18	1.78	0.45	4.31	0.12	0.92	0.41	4.94	0.45	4.94	0.31	4.53	0.41	4.53
6	0.51	9.44	0.54	9.44	0.40	7.42	0.50	7.42	0.56	8.77	0.54	8.77	0.55	7.82	0.50	7.82	0.55	9.68	0.39	2.63
7	0.19	2.79	0.16	2.79	0.15	2.46	0.18	2.46	0.25	3.46	0.27	3.46	0.21	2.81	0.21	2.81	0.17	2.98	0.25	2.98
8	0.08	1.35	0.06	1.35	0.11	1.82	0.10	1.82	0.09	1.50	0.09	1.50	0.10	1.45	0.09	1.45	0.06	1.18	0.07	1.18
9	-0.05	-0.78	-0.04	-0.78	-0.23	-2.19	0.05	0.63	-0.07	-0.91	-0.06	-0.91	-0.08	-1.06	-0.08	-1.06	-0.07	-1.14	0.16	1.06
10	0.25	3.84	0.27	3.84	0.20	2.74	0.19	2.74	0.36	4.18	0.05	0.48	0.26	3.23	0.28	3.23	0.30	4.25	-0.16	-1.19
11	0.17	2.60	0.17	2.60	0.18	2.25	0.14	2.25	0.31	4.53	0.42	4.53	0.16	2.10	0.19	2.10	0.13	1.83	0.83	6.06
12	0.07	1.12	0.07	1.12	0.08	1.05	0.07	1.05	-0.04	-0.47	0.22	2.22	0.05	0.67	0.06	0.67	0.06	1.05	0.05	1.05
13	0.12	2.00	0.10	2.00	0.15	2.09	0.11	2.09	0.04	0.95	0.07	0.95	0.16	2.44	0.18	2.44	0.14	2.42	-0.15	-1.45
14	0.19	2.70	0.17	2.70	-0.03	-0.29	0.32	3.79	0.14	2.29	0.21	2.29	0.16	2.12	0.19	2.12	0.19	3.01	0.16	3.01

(1) Recycling behavior → Beliefs about recycling; (2) Beliefs about recycling → Ecological conscience; (3) Recycling behavior → Ecological conscience; (4) Beliefs about recycling → Ecological concern; (5) Ecological conscience → Ecological concern; (6) Recycling behavior → Attitude toward recycling; (7) Beliefs about recycling → Attitude toward recycling; (8) Ecological concern → Attitude toward recycling; (9) Ecological conscience → Attitude toward recycling; (10) Recycling behavior → Involvement with recycling; (11) Attitude toward recycling → Involvement with recycling; (12) Ecological conscience → Involvement with recycling; (13) Ecological concern → involvement with recycling; (14) Beliefs about recycling → *involvement with recycling*

liefs about recycling in the case of older people but not in the case of younger people. Secondly, beliefs about recycling determine ecological concern in the case of older people but not in the case of younger people. Thirdly, ecological conscience influences ecological concern in younger individuals but not in older ones. Fourthly, the relationship between ecological conscience and attitude toward recycling is inverse in younger people but it is not significant in older people. Finally, beliefs about recycling influence involvement with recycling in the case of older people but this influence is not significant in younger people. On that basis, I fail to reject Hypothesis H3, which states that *consumers' recycling adoption models vary according to the sociodemographic factor of age.*

With respect to education four significant differences have been found. Firstly lesser educated people acquire ecological conscience more from beliefs about recycling than their more highly educated peers. Secondly, ecological conscience leads to ecological concern in lesser educated people but not in more highly educated people. Thirdly, recycling behavior determines the level of involvement with recycling in lesser educated individuals but not in the more highly educated. Amongst the more highly educated the degree of involvement with recycling depends on the level of ecological conscience. On that basis, I fail to reject Hypothesis H4, which states that *consumers' recycling adaptation models vary according to the sociodemographic factor of education levels.*

Income only shows one significant difference at parameter level. To be specific the beliefs of people with lower incomes regarding recycling come from recycling behavior but in the case of people with higher levels of income this knowledge about what and how to recycle is not determined by the performance of a recycling conduct. We can therefore conclude that I fail to reject Hypothesis H5, which states that *consumers' recycling adaptation models vary according to the sociodemographic factor of income.*

Finally, there are five significant differences related to the area of residence. To be more specific, it can be seen that living in an urban zone makes people involved with recycling thanks to developing recycling behavior and the appearance of this desired conduct determines attitude toward recycling in a higher degree than in the case of rural areas. Furthermore, in rural areas the level of involvement with recycling is due to the degree of attitude toward recycling while in urban zones the involvement with recycling is determined by beliefs about recycling. Thus, I fail to reject Hypothesis 6, which states that *consumers' recycling adoption models vary according to the sociodemographic factor of their area of residence.*

CONCLUSIONS

The classic paradigm is not only the predominant framework to understand pro-environmental behaviors but also the prevalent model to implement strategies in order to support recycling. Nevertheless this paper demonstrates that there exists a conative hierarchy of effect which enables us to appreciate how a consumer recycles and therefore how to design an optimal recycling approach for social marketers and public policy makers. To be specific, it is recognized that putting behavior first there is one challenge route to persuade people about recycling: the low involvement strategy with "do-know-feel" hierarchy of effect. To be more specific, the empirical evidence obtained highlights the idea that this hierarchy of effect might be not only the best adjusted to represent the recent recycling behavior but also the best way to promote the desired conduct in its current phase of advanced expansion.

Referring to this best conative model of adoption, the results show that there are two key variables: behavior and beliefs about recycling. Thus social marketers should provide beliefs about recycling by inducing consumers to take one step forward in recycling directly since these variables are the source for setting in motion ecological conscience, favorable attitude toward recycling and involvement with recycling. In any case if social marketers or public policy makers wished it would be possible to ensure this adoption model by providing some information about the environment and about how to solve its deterioration problems given that ecological conscience leads to ecological concern and after that, involvement with recycling is accomplished.

Therefore, the summarized implications for a general strategy to encourage recycling conatively are (1) a clear explanation about how and why recycling is essential and primordial since beliefs about recycling, together with recycling behavior, are the boosting variables of the entire adoption process and (1) ecological conscience might be associated to the appearance of recycling behavior by means of certain sentiments of disquiet about environmental degradation given that this information about environmental issues facilitates the development of a higher degree of involvement with recycling.

The importance of these implications lies in the fact that learning by doing might save a lot of effort in promoting recycling at the present advanced phase of diffusion. In fact, the classic teaching paradigm about recycling stresses the importance of providing a great amount of information with the aim of facilitating the appearance of the desired response, while the conative strategy just highlights the need to develop what everyone knows to do nowadays: separate trash. In addition, it is quite accepted that learning by doing is more vivid than learning only by a cognitive approach. So it seems logical to think that it might be more effective and efficient to teach by doing rather than burdening the individual with vast amounts of information about ecological and recycling issues.

In addition, there are alternative routes to encourage the desired adoption process depending on individuals' sociodemographic characteristics. For this reason, several models have been developed depending on the sociodemographic profile. As age, education and area of residence display the most significant difference in the best conative model of adoption, some detailed recommendations are understood from their multi-groups models. These conclusions are drawn after examining the standardized estimators and the critical ratios.

The strategy to be implemented with respect to age should recognize that older people show a higher level of involvement with recycling if they know about what and how to recycle (beliefs about recycling) as well as they perform recycling behavior. For this reason, older people acquire involvement with recycling more by doing or practically than by theory. In contrast, in the case of younger people it is more important to have a solid

ecological conscience given that this is the antecedent of ecological concern and hence involvement with recycling is developed.

Furthermore public policy implications must consider that more highly educated people are both more involved with recycling and they show a higher degree of ecological conscience. Therefore, for this profile of people environmental education must highlight the importance of information about environmental damage and how to behave in an environmentally friendly manner. Nevertheless, the strategy to increase involvement with recycling in the case of lesser educated people must work on recycling behavior directly given that the level of importance recognized in recycling is only determined by the performance of the desired conduct.

Similarly, area of residence should be considered as a very powerful characteristic of segmentation in public policy since living in urban or rural zones determines the recycling adoption process. To be specific, in the rural recycling adoption process a stronger involvement with recycling might be achieved by working on a favorable attitude toward recycling while in urban areas the degree of involvement with recycling depends on the appearance of the desired conduct. Another strategy could consist of increasing the elements of concern or disquiet within a promotional message under the assumption that greater aroused involvement will be caused in the audience and in this way the degree of involvement with recycling will be developed successfully, perhaps with a higher level of involvement. From this perspective, a high concern or disquiet message is the most appropriate type of content to evoke comparatively greater success in urban consumers.

Although income and gender do not make great differences to the general approach, these characteristics do offer a few detailed guidelines on optimizing the promotion of recycling. With respect to income it should be considered that for lower income people, beliefs about recycling come from recycling behavior but this is not in the case with higher income people. For the latter, the knowledge about what and how to recycle must be transmitted by informing or providing this information externally since they do not acquire it from their own experience. Finally, with respect to male individuals, and in order to enhance communication effectiveness, we should place greater emphasis on ecological concern if the public policy aim is to increase involvement with recycling, since in men there is a clearer connection between ecological conscience and ecological concern than in women. However, in either case ecological concern determines the degree of involvement with recycling.

Future lines of research might overcome the limitations of the present work by revealing the psychographic characteristics that explain why there are differences in the recycling adoption process at the level of sociodemographic characteristics and thus why several strategies should be implemented depending on age, education, and zone of residence. In other words, given that sociodemographic characteristics are non intellective they cannot explain the mentioned differences rather than values, personality, and motivation which imply the real reason to justify alternative models as well as treatment of promotion. In any case psychographic factors are intellective but invisible and this is the value related to sociodemographic factors: the accessibility provided from being visible and thus identifiable.

Additionally, if this approach contributes to social marketing literature not only by providing further strategies to encourage recycling but also in highlighting the idea that recycling behavior can be regarded as a habit with low involvement attachment, there must be more hierarchies of recycling to be implemented. For example, emotional hierarchies of effect that might explain how recycling also involves emotional processes. In fact, this could be given that the "do-know-feel" hierarchy of effect implies a special role to be played by ecological concern. It has been demonstrated that by applying some disquiet feeling about the deterioration of nature, social marketers might be able to determine the degree of involvement with recycling. Therefore, why not estimate a recycling adoption model starting with an ecological concern hierarchy of effect?

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