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Psychological Determinants of Paying Attention to Eco-Labels in Purchase Decisions: Model Development and Multinational Validation

ABSTRACT. Environmental labels are useful from an environmental policy perspective only if they are noticed by the consumer in the shopping situation and next – what is more – understood, trusted, and valued as a tool for decision-making. In this paper, a psychological model explaining variations in consumer attention towards environmental labels is developed and its ability to predict attention towards environmental labels in various European countries is tested.

Attention is a major scarce resource
(Herbert A. Simon)

As the abatement of pollution from large industrial sources seems to be within reach, environmental policy in Europe and elsewhere focuses increasingly on reducing the impact of "non-point" sources of pollution (Miljøstyrelsen, 1996), in particular on the pollution (and resource use) associated with private consumption (Geyer-Allély & Eppel, 1997; Norwegian Ministry of Environment, 1994b; OECD, 1997; Sitarz, 1994).

Pollution and the consumption of scarce resources are associated with all phases of the consumption cycle (Pieters, 1991): acquisition of consumer goods and services, their use in the production of utilities in (or outside) the household, and the disposal of possible rest products. Until now, most environmental policy directed at private households has targeted the use phase (e.g., lowering of thermostats, switching off lights when leaving a room) or the disposal phase (e.g., recycling). However, in line with the view that in environmental policy "upstream" solutions (i.e., prevention) are generally preferable to "downstream" ones (i.e., cure) (Eurostat et al., 1995), the focus of this sub-field of environmental policy has shifted towards influencing consumer purchases (e.g., Heiskanen et al., 1998; Miljø- og Energiministeriet, 1995; Miljøstyrelsen, 1996).

As strongly emphasised at the Oslo Symposium on Sustainable

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Consumption in 1994, both for democratic and control reasons the needed changes in consumption patterns cannot be achieved by force, but only with "the willing participation of the consumers" (Norwegian Ministry of Environment, 1994a, p. 13). For these (and other) reasons, information policy plays a key role in environmental policy targeting consumers. One of the most promising forms of environmental information policy, in terms of providing timely and relevant information for the consumer, is environmental labelling (Hansen & Kull, 1994; Miljø- og Energiministeriet, 1995; Scammon & Mayer, 1993). For example, a Swedish study credited environmental labelling, and consumer choice of labelled products, for a considerable reduction in the environmental impact caused by the Swedish forest industry (Naturvårdsverket, 1997).

Beginning with the German "Blauer Engel" in 1977, a number of national environmental labelling schemes – and a plethora of industry or industry association schemes of varying seriousness – have developed (e.g., Enger, 1998; EPA, 1998; Forbrugerstyrelsen, 1993; Mayer & Gray-Lee, 1995; Scammon & Mayer, 1993).[1] The U.S. Environmental Protection Agency was able to collect information about 49 "third-party" schemes issued worldwide in 1997, of which only 17 existed in 1989, and the number is still growing (EPA, 1998). In recent years, labels based on cross-national schemes have begun to appear in European supermarkets, notably the "Swan" in the Nordic countries and EU's "flower." Table I shows the status (in the late 1990s) of industry's adoption of some of the most important environmental labels in the industrialised countries.

TABLE I
The Adoption of Environmental Labels by Industry in a Number of Countries

Label	Country(ies)	Year founded	Number of products	Number of product groups
Blue Angel[1]	Germany	1977	4,350	80
Nordic Swan[2]	The Nordic Countries	1989	>1,500	46
EU Flower[2]	EU	1992	200	14
Green Seal[3]	USA	1989	318	19
Environmental Choice[3]	Canada	1988	1,600	48
Eco-Mark[3]	Japan	1989	2,023	71

Sources: [1]The www home page of the Swiss Ministry of Environment (status summer 1997). [2]Regeringskansliet (1999) (status spring 1999). [3]OECD (1997) (status 1996).

Of course, environmental labels are useful from an environmental policy perspective only if consumers use them in their decision-making. However, there are still few published studies of the effectiveness of labelling schemes in this respect (OECD, 1991, 1997).

Most of the published studies focus on consumers' recognition of or knowledge about labels and/or their trust in them (OECD, 1997; for examples, see, e.g., Bekholm & Sejersen, 1997; Tufte & Lavik, 1997), implicitly or explicitly assuming that these are fundamental prerequisites for the use of a label in decision-making. The (implicit or explicit) framework of such studies seems to be a response hierarchy or stage model of decision-making, described in any standard text in consumer behaviour (e.g., Peter, Olson, & Grunert, 1999), the stages including at least knowing and trusting, deciding, and buying (followed by a behavioural outcome stage, which is where the real success of the labelling scheme should be measured).

However, practically all studies are purely descriptive, leaving the question *why* consumers know, notice, and use labels only sporadically answered. With few exceptions (e.g., Verplanken & Weenig, 1993) it is not systematically considered how the decisions that the labels are meant to influence are made and which influences this may have for the functioning and effectiveness of labelling.

For instance, there is plenty of evidence that how, and how much, consumers attend to information in a buying situation depends on their involvement in the decision (e.g., Celsi & Olson, 1988; Herr & Fazio, 1993; Kokkinaki, 1997). In general, one cannot count on information about environmental consequences, in the form of a label or otherwise, producing high involvement in itself. The isolated consequences – environmental as well as personal – of each individual decision are simply too small in most cases (Thøgersen, 1998a). If this is the case, and if other self-relevant information competes for the consumer's attention – sometimes to a degree where the consumer experiences information overload (Jacoby, 1984) – consumers may easily fail to notice relevant labels in the buying situation.

The purpose of this paper is to contribute to a systematic understanding of how eco-labels (and possibly other types of labelling) work. (The terms "environmental label" and the shorter "eco-label," Hansen & Kull, 1994, are used interchangeably in this paper.) The specific objectives are to develop a psychological model explaining when and why consumers pay attention to environmental labels in

the buying situation and to demonstrate the model's ability to predict the attention paid to environmental labels in various European countries. The model is tested and cross-validated by means of data from the former West Germany, the European country with the longest tradition for environmental labels, the former East Germany, Great Britain, Ireland, and Italy. But first a (selective) review of previous research with a bearing on whether consumers notice, understand, trust, and value environmental labels is presented.

PREVIOUS RESEARCH

Knowing a label is a prerequisite for using it in decision-making and understanding it is a prerequisite for using it correctly. Understanding a label implies that the person knows it exists, what it looks like, and what it means. For example, a survey in 1997 in the Nordic countries found that 44% of Danish consumers, as opposed to from 5 to 15% of the consumers from other Nordic countries, had no idea what the Swan label meant, and many who thought they knew were wrong (Lindberg, 1998)![2] Another survey from the same year confirmed the low recognition of the Swan label among Danish consumers and found an even lower recognition of EU's flower (Bekholm & Sejersen, 1997), which is still rarely seen in Danish shops. Ninety percent knew the label that is used to indicate that a product is recyclable (particularly used on wine bottles) or is produced from recycled materials (particularly on paper products). A study of the Danish "state controlled organic" label for food products five years after its introduction (in 1990) found that 57% of a broad sample of consumers were not able to identify the correct label among three alternative designs (Thøgersen & Andersen, 1996).

Recognising a label is not the same as understanding the exact meaning of it. For example, one study found that only about 5% of a representative sample of US consumers exhibited a thorough understanding of the terms "recycled" and "recyclable" (Morris, Hastak, & Mazis, 1995).

A consumer will use a label (as intended) in decision-making only if he or she trusts the message it conveys (Hansen & Kull, 1994). A large number of studies have found that consumers are sceptical towards green product claims (see Peattie, 1995). One study cited by Peattie found that 71 percent of British consumers thought that

companies were using green issues as an excuse to charge higher prices. However, many studies find that labels and other types of environmental information provided by public and other independent sources are trusted more than information provided by producers or retailers (e.g., Eden, 1994/95; Enger & Lavik, 1995; MacKenzie, 1991; Schlegelmilch, Bohlen, & Diamantopoulos, 1996; Tufte & Lavik, 1997). Unfortunately, and perhaps because the state controlled labels are outnumbered so many times by private labels and other types of environmental information, many consumers are uncertain or hold outright erroneous beliefs about who issues state controlled labels, such as the Nordic Swan. A Norwegian study found that such mistakes reduce the trust in the Nordic Swan (Tufte & Lavik, 1997).

Even consumers who know and trust a relevant environmental label will not use it if they do not notice it due to information overload (Jacoby, 1984) or for other reasons. For instance, in 1992 it was estimated that there were 400–600 private labels, in addition to 36 labelling schemes issued by public authorities, targeted at Danish consumers (Forbrugerstyrelsen, 1993). A study in 1996 found environmental claims on 63% of the packaged goods within 16 product categories in the major supermarkets in Oslo (Enger, 1998). A minority of 8% of the goods carried an environmental label issued by the state or another "third party" organisation.

Besides trust and knowledge, a fundamental prerequisite for paying attention to eco-labels in an information-crowded environment, seldom mentioned in the labelling literature (but see, e.g., Palm & Windahl, 1998), is that the consumer believes that the label helps him or her attain some goal (e.g., Forbrugerstyrelsen, 1993; Nilsson, Nissen, Thøgersen, & Vilby, 1999). Just like unit pricing helps the consumer obtain the goal of value for money and nutrition declarations health-related goals, environmental labelling helps consumers obtain environmental goals. Hence, an informative label about a product's environmental performance will influence decision making only if consumers desire environment-friendly products (unless they believe that other advantages are associated with environmental friendliness, Thøgersen, 1998b). Studies have found that large segments of Western European and North American consumers demand environmentally friendly products in such diverse areas as packaging (Bech-Larsen, 1996; Thøgersen, 1996), food products (Biel & Dahlstrand, 1998; Grunert & Juhl, 1995; Sparks & Shepherd, 1992; Thøgersen, 1998b), paint (Buchtele & Holzmuller, 1990), and heating systems (Berger,

Ratchford, & Haines, Jr., 1994). For example, in 1997 61–71% of representative samples of consumers from the Nordic countries claimed that they "sometimes" or "always" check out the environment-friendliness of the products they buy (Lindberg, 1998).

However, consumers obviously vary in the importance they attach to environmental goals, often referred to as pro-environmental attitudes. It is well documented that pro-environmental attitudes increases consumers' propensity to buy environment-friendly products (e.g., Berger, Ratchford, & Haines Jr., 1994; Biel & Dahlstrand, 1998; Buchtele & Holzmuller, 1990; Sparks & Shepherd, 1992; Thøgersen, 1998b). Less researched in this connection is Fazio's (1986; Roskos-Ewoldsen & Fazio, 1992) proposition that attitudes also influence which information about a product a consumer pays attention to, including information about the product's environment-relevant characteristics (but see Thøgersen, 1999).

THEORETICAL FRAMEWORK

As indicated above, "paying attention to eco-labels" is hardly a goal in itself, but rather a means to a goal: buying (more) environment-friendly products, which is a means to the more abstract goal of protecting the environment (and perhaps to more selfish goals as well). Hence, it is unlikely that a consumer pays attention to an environmental label unless he or she values protecting the environment, perceives buying (more) environmentally friendly products as an effective means to achieve this goal (Ölander & Thøgersen, 1995; Stern, Dietz, Abel, Guagnano, & Kalof, 1999), and perceives the information that the label conveys as useful for this purpose (Hansen & Kull, 1994).

Few products are acquired with the sole (or main) purpose of protecting the environment. Typically, consumers buy goods for the private utility they provide. However, consumers seem to be increasingly aware and concerned that serious environmental impacts may be associated with the production, use, and/or disposal of products they buy. Many consumers are willing to make an effort to diminish the negative environmental impact of their consumption, and environmental labels are welcomed as a tool for this purpose. However, given that environmental attributes – as long as they do not represent any personal threat – are clearly peripheral to what the consumer wants

to achieve through the purchase (e.g., Kotler, 1991), usually the issue will not be a high involvement one.

In an environmentally concerned consumer's mental script for buying certain goods, there may be a sequence labelled "choose the most environmentally friendly alternative within the consideration set." Depending on how frequently and recently the consumer has made this particular purchase, the sequence may be more or less automatic. If an eco-label exists for the product category, paying attention to it is almost certainly a part of the sequence, although little consciousness needs to be devoted to the task in the highly rehearsed cases. If no eco-label is available, other sources of information (or cues) about the product alternatives' environmental attributes may be consulted.

If the consumer is inexperienced with the buying of this kind of product, if environmental information about the product has just become available, or if he or she has – for some other reason – not previously been aware that there are potential environmental hazards associated with this type of purchase, they have to go through a somewhat more elaborate procedure in order to be able to make an environment-friendly choice. (1) Find out which types of environmental information – including eco-labels – are available, what an eventual label looks like, where it is placed, and what it means. (2) Evaluate the usefulness and reliability of the information.

Based on the understanding that interested consumers hold or develop scripts for the purchase of environment-friendly products and that they use eco-labels as a means of carrying out such scripts (similar to the way they use a menu in a restaurant), one may specify a series of steps that an individual's decision process must pass through before an environment-labelled product is purchased. All consumers will not pass through all steps every time. Once made, the results of passing through a step are stored in memory and can be activated, if relevant, in subsequent decision situations. Hence, the assumption is only that for an individual to consciously buy an eco-labelled product, at some time prior to the purchase he or she must have come to:

1. form a personal goal of protecting the environment (a pro-environmental attitude),

2a. believe in cautious buying as a suitable strategy for achieving this goal,

2b. know about eco-labels: that they exist, what they look like, what they mean,
2c. trust labels: that the information provided is relevant and important, that it is true.

In the buying situation, he or she must at least:

3. pay attention to eco-labels, and
4. decide to buy the eco-labelled product.

As indicated by this sequence, it is the purchase of environment-friendly products as a goal-directed behaviour, not as the coincidental outcome of other factors, which is interesting when considering the functioning of eco-labels. Further, the sequence refers to cases where the decision to buy an eco-labelled product is made in the shopping situation. This is typical for low-involvement, but less so for high-involvement purchases. Three steps are given the same number *2*, followed by a different letter, in order to indicate that these steps can be taken in different sequences with more or less equal *a priori* likelihood.

Other factors, besides the indicated means-goals concerns, may produce variation in the attention paid to eco-labels. Most obviously, it may depend on external conditions and opportunities – in particular the availability of eco-labels in the shopping environment. In addition, variation may be caused by personality-related factors. In this category, researchers dealing with environment-friendly behaviour have particularly emphasised the importance of self-perceptions regarding one's ability to influence the attainment of goals like a cleaner environment (often termed perceived consumer effectiveness, PCE, e.g., Berger & Corbin, 1992; Ellen, Wiener, & Cobb-Walgren, 1991; Kinnear, Taylor & Ahmed, 1974).[3]

PCE, a pro-environmental attitude, a belief in environment-friendly buying, and trust may all be thought of as motivating factors, i.e., determinants of how hard a consumer will look for eco-labels in a buying situation. From their positions in the decision process it follows that pro-environmental attitude is assumed to be a more distal determinant than belief in environment-friendly buying and trust, and that its influence on the subsequent steps is partly or wholly mediated through, these other factors. This assumption is consistent with what one can infer from the specification levels of the three variables. While the latter two constructs share, more or less, the specification level

of the next step in the sequence, pro-environmental attitude is a more general concept. The influence of a general attitudinal variable on a specific behavioural criterion is typically found to be more distal than, and partly or wholly mediated through, more specific determinants (Eagly & Chaiken, 1993). Hence, it also follows that the influence of general personality traits, such as PCE, should be expected to be mediated through more specific determinants such as belief in environment-friendly buying and trust.

Causally, knowledge about and availability of labels represent internal and external conditions that, together with motivation, co-determine paying attention to labels.[4] Knowledge and availability of labels are hardly mutually independent either. The eco-labels offered – and the information used to promote them – are among consumers' most important sources of knowledge about eco-labels (Nilsson et al., 1999). It also seems reasonable to expect that these two variables influence paying attention to eco-labels, both directly, as already suggested, and indirectly, through consumers' motivation to look for eco-labels.[5]

From this discussion a causal path model, explaining consumers' propensity to pay attention to eco-labels, can be extracted. Figure 1 outlines this model.

The model illustrated in Figure 1 can, of course, be extended. For example, trust in environmental labels depends not only on the two determinants included in the model, but also on external factors, notably the bodies that provide and/or control the label (e.g., Eden, 1994/95; Enger & Lavik, 1995; Hansen & Kull, 1994; MacKenzie,

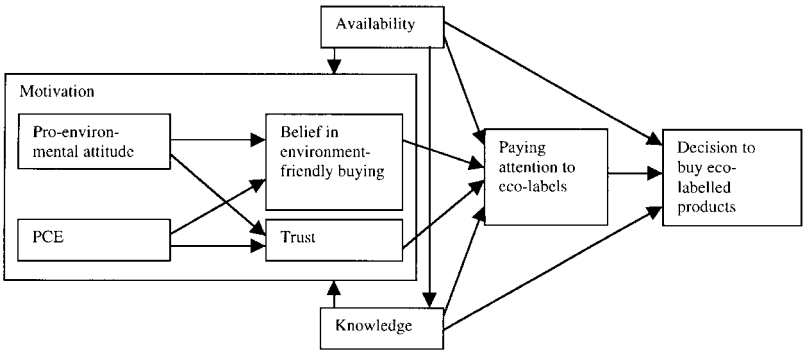

Figure 1. Predicting paying attention to eco-labels and the purchase of labelled products.

1991; Schlegelmilch et al., 1996; Tufte & Lavik, 1997). Most other variables in the model also have additional exogenous antecedents. The model can also be extended forward, adding possible outcomes of the decision (buying behaviour and behavioural outcomes). Further, since purchase decisions involving eco-labels are often recurrent, one could add feedback effects, linking a "downstream" variable (in one decision-making process) with a more "upstream" one (in a later decision-making process). These extensions would produce a more complete, but also a more cluttered model. As in most other cases, clarity and focus are achieved at the expense of completeness.

Theories of decision-making under conditions not conducive to extensive deliberation, such as Fazio's (1986) attitude-to-behaviour theory, fuels the expectation that some of the suggested determinants of paying attention to eco-labels could interact.[6] Fazio suggests that attitudes guide behaviour by creating selective attention towards issues and objects in our surroundings that are consistent with the attitude. For instance, a consumer with a pro-environmental attitude is presumably more attentive than one without to cues that inform about products' environmental qualities, such as eco-labels. Therefore, he or she is also more likely to buy environment-friendly products. This is consistent with the reasoning above.

Fazio makes the important additional point, however, that attitudes have this effect only under certain conditions. Basically, whether or not attitudes guide attention and behaviour depends on their accessibility from memory, or strength. Strong attitudes get activated by mere exposure to an attitude object while the activation of weaker ones depends on stronger stimuli. The strength of an attitude depends on a number of factors such as how much the individual has considered (or "rehearsed") it, experience with, knowledge about, and faith in one's knowledge about the attitude object, and the personal relevance of the attitude and the attitude object (see, e.g., Petty & Krosnick, 1995). In Figure 1 it is indicated that the effect of pro-environmental attitude on paying attention to eco-labels is mediated through more proximal determinants. Fazio's attitude-to-behaviour theory and attitude strength research indicate that the proximal determinants may also moderate the impact of the pro-environmental attitude. It has also been suggested that the effects of motivation and conditions on environment-friendly behaviour are not additive, but that they interact (e.g., Guagnano, Stern & Dietz, 1995; Ölander & Thøgersen, 1995).

THE DATA

The motivation-attention part of the model is tested by means of cross-national survey data collected by the European Consortium for Comparative Social Surveys (COMPASS) in 1993 as part of the so-called REAP programme.[7] The programme applies to five countries, Germany, Britain, Ireland, Italy, and the Netherlands. In Germany, two samples were used in order to be able to control for possible differences between the federal states of Eastern and Western Germany remaining only a couple of years after the reunion. In each country or area, a stratified probability sample of from 957 (Ireland) to 1,261 (Great Britain) people was interviewed. However, due to missing values and the use of listwise deletion, the active sample sizes are reduced up to 15%. The objective was to ask the same questions in the different countries, save for translations. However, some items used in the present study unfortunately differ substantially between the Dutch and the other questionnaires. Therefore, the Netherlands was excluded from the present study, leaving us with two German, a British, an Irish, and an Italian sample.

Still, the data set offers an unusual opportunity to evaluate the international generality of the pattern of determinants of an important social behaviour. Obviously, the survey was not designed to test the model suggested here. This has two important implications. The data set contains no information about availability of and knowledge about eco-labels, meaning that only the motivation-attention part of the model can be tested. Further, even though the data set contains indicators that can be used to represent the concepts in, and to perform at least a preliminary test of, this – crucial – part of the model, they are not necessarily ideal for the purpose in all cases. Both of these limitations should be considered carefully when interpreting the results.

In the survey, paying attention to environmental labels was measured by the question: “When you are choosing a product, how often do you pay attention to any environmental labelling before deciding to buy?” with the response categories always, often, sometimes, and never. Before the question was posed, the issue was introduced by the text “Now a few questions about environmental labelling, that is, information about how a product or its packaging may affect the environment.” In the following analyses, the response categories are coded as 4, 3, 2, and 1.

The willingness to carry economic sacrifices, one way or the other, to protect the environment is used as an indicator for the personal importance of environmental protection in the individual's goal hierarchy, or pro-environmental attitude. The construct is represented by three questions: "How willing would you be to pay much higher prices/to pay much higher taxes/to accept cuts in your standard of living in order to protect the environment?" Answers were registered on a five-point scale with the end points "very willing" and "very unwilling."

The trust in eco-labels is registered by the question "If you look at environmental labelling on products, how often do you trust it?" with the response categories always, often, sometimes, and never. In the following analyses, these categories are coded as 4, 3, 2, and 1. Unfortunately, in the REAP survey those that never paid attention to environmental labels were not asked about their trust in such labels. So it is not possible to analyse the importance of distrust for totally ignoring labels. However, the data can be used to investigate the importance of trust for variations in the frequency of paying attention to eco-labels among those who do this at least sometimes.

Perceived consumer effectiveness (PCE) is represented by a single item from the survey: "It is just too difficult for someone like me to do much about the environment," measured on a five-point scale with the end points "strongly agree" and "strongly disagree."

The survey contained no direct measures of consumers' belief in cautious buying as a strategy to protect the environment. However, items focusing on the individual's effort to avoid potential environmental hazards associated with purchases in different situations can be used to construct an indirect measure of such a belief. A strong tradition in attitude theory holds that behavioural indicators such as these reflect and, hence, can be used to represent attitudes (e.g., Eagly & Chaiken, 1993). Arguably, belief in environment-friendly buying is, if not identical to, then at least a large component of the attitude towards environment-friendly buying. So, lacking better alternatives, the extent to which an individual makes an effort to avoid environmental hazards associated with purchases in different situations is used as an indicator of his or her belief in environment-friendly buying. One would have wished to have recourse to a large number of items focusing on efforts of this sort in various types of buying decisions (other than attending to eco-labels). Unfortunately, only two relevant items were included in the REAP survey: "How often do

you make a special effort to buy fruits and vegetables grown without pesticides or chemicals?"[8] and "When you are shopping, how often do you pay attention to the amount of wrapping or packaging used on products before you decide to buy something?" The response categories were always, often, sometimes, and never. In the following analyses, these categories are coded as 4, 3, 2, and 1.

The availability of and knowledge about environmental labels were not registered in the REAP survey. Hence, these variables may be sources of structural differences in the international comparison. Knowledge, in particular, may be a source of rest variance within a country.

ANALYSES

Figure 2 shows the frequency of paying attention to eco-labels in the analysed countries. It appears that a large majority of consumers in these countries pays attention to eco-labels, at least sometimes. Only from 8% (Great Britain) to 15% (Ireland) never do that. Among those who pay attention, the Irish seem to be most, and the Germans least, consistent. Measured on a 4-point scale, the mean score varies within a relatively narrow range, from 2.56 (West Germany) to 2.98 (Ireland). The differences between means are statistically significant ($p < 0.01$) except for the difference between East Germany and Italy and that between Great Britain and Ireland. Interestingly, and somewhat surprisingly, it seems that consumers pay least attention to eco-labels in the country with the strongest tradition for such labels, West Germany. However, caution is recommended before drawing such a conclusion since the finding is sensitive to possible selection and response biases and also to national variations in the understanding of the question.

The analysis of relationships between constructs in the model consists of three steps. First, the suggested causal paths are tested on the West German data. Next, the generality of the found direct relationships between motivational antecedents and paying attention is tested by comparing the West German data with the other four data sets. Third, possible interactions between pro-environmental attitudes and other motivational variables are searched for in each of the five data sets.

Based on the polychoric correlation matrices in the Appendix,

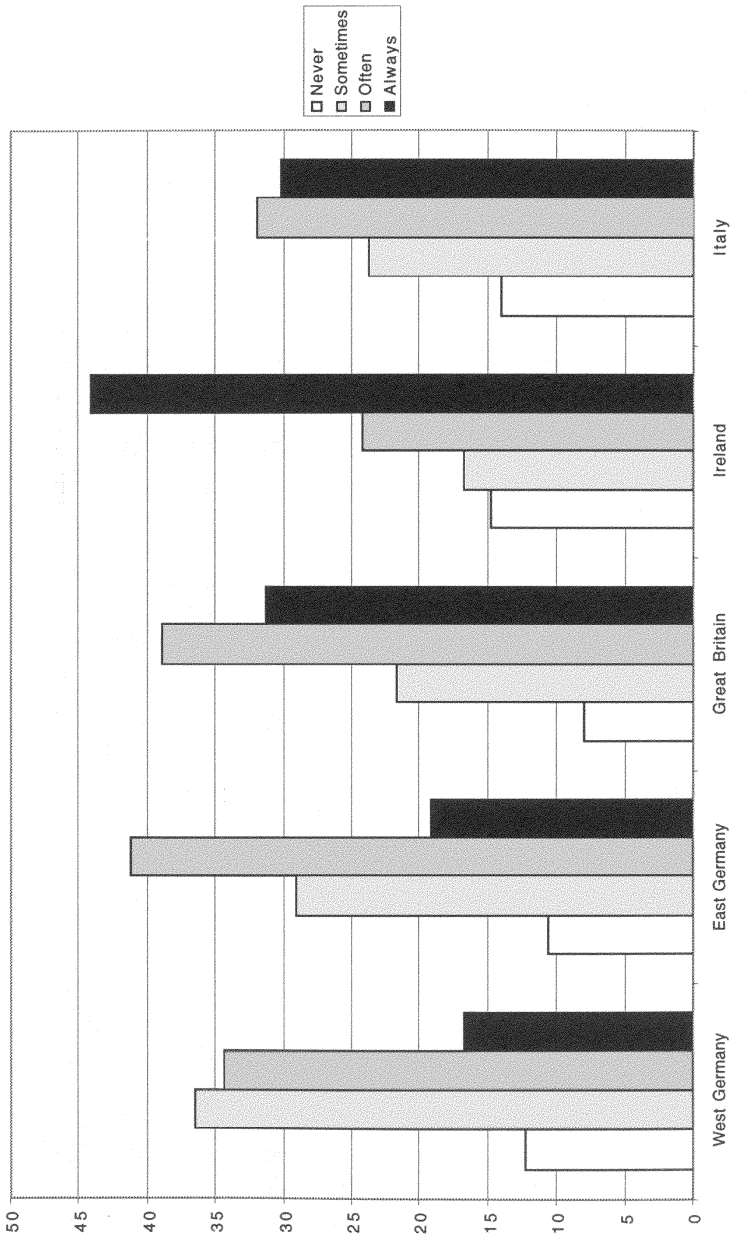

Figure 2. Frequency of paying attention to eco-labels by country, N = 5,323.

structural equation analysis, using LISREL version 8.30 with WLS estimation (Jöreskog, Sörbom, Toit, & Toit, 1999), is used in the first two steps. An important advantage of this method is that it makes it possible to separate the part of the variance in an observed variable that reflects a theoretical construct under study from the part that reflects other factors ("error" from the point of view of the analysis) in cases where there are more indicators than one of a theoretical construct (which unfortunately holds for only two of the constructs in this study). In addition, with structural equation analysis, it is possible to estimate the hypothesised complex path model in one run and, hence, control for all possible relationships among variables included in the model. In a comparative study, multiple sample structural equation analysis offers a rigorous test of differences between samples as well as the possibility to distinguish differences with substantive causes from differences due to variation in the interpretation of questions.

Table II presents the structural equation analysis of the motivation-attention part of the model in Figure 1 for West Germany.

The analysis of the measurement model shows that the two latent constructs based on multiple items have acceptable internal reliabilities (ρ_ξ) and also acceptable individual factor loadings (λ) and reliabilities ($1 - \theta$). The highest correlation between latent constructs is 0.63 (between belief in buying strategy and paying attention), indicating discriminant validity as well.[9] The fit indices indicate an acceptable overall fit, thus confirming that the measurement model and the suggested structural relationships give a good representation of the data.

Basically, the structural equation analysis confirms the suggested relationships. Paying attention to environmental labels is correlated with the personal importance of the goal of protecting the environment (pro-environmental attitude) and with the consumer's perceived effectiveness regarding environmental problems. However, the structural model confirms that the influence of both of these broad concepts is indirect (see the non-significant *t*-values for the direct paths from these variables to paying attention) and mediated through the belief in buying as a strategy to protect the environment and through the trust in environmental labels (only pro-environmental attitude). Together, these latter two concepts account for 58% ($100\chi(1 - \zeta)$) of the variation in paying attention to environmental labels. Pro-environmental attitude and PCE account for 25% of the variation in belief in buying

TABLE II
Determinants of Paying Attention to Eco-Labels in West Germany (N = 824)

Measurement Model

	Prol	Pro2	Pro3	PCE	Orga	Pack	Trust	Atten
λ	0.88	0.82	0.75	1.00	0.63	0.73	1.00	1.00
θ	0.22	0.33	0.43	–	0.60	0.47	–	–
	Pro-environmental attitude				Belief in buying strategy			
ρ_ξ	0.86				0.63			

Structural Model

Path from:	Belief in buying strategy	Trust	Pro-environmental attitude	PCE	ζ
To:					
Paying attention	0.63 (9.12)*	0.42 (11.02)	–0.08 (–1.62)	–0.03 (–0.84)	0.42
Belief in buying strategy			0.39 (6.98)	–0.21 (–3.98)	0.75
Trust			0.12 (2.64)	–0.00 (–0.00)	0.99

Covariance Matrix of Latent Variables

	Paying attention	Trust	Belief in buying strategy	Pro-environmental attitude	PCE
Paying attention	1.00				
Trust	0.45	1.00			
Belief in buying strategy	0.63	0.05	1.00		
Pro-environmental attitude	0.27	0.12	0.45	1.00	
PCE	–0.23	–0.04	–0.33	–0.31	1.00

Overall fit: GFI = 0.99, CFI = 0.95, RMSEA = 0.072

* *t*-values in parentheses.

strategy, but only for 1% of the variation in trust in eco-labels. As one could imagine, the covariance matrix of latent variables shows that the two exogenous variables are negatively correlated ($p < 0.001$). The negative correlation indicates that the more the individual believes that it is too difficult to do much about the environment (i.e., the lower the PCE), the less he or she is willing to offer to protect the environment (i.e., the less pro-environmental the attitude).

The generality of these results across countries and regions is tested by means of the multiple sample structural equation analysis, reported in Tables III and IV. The five correlation matrices in the Appendix are used as input. A brief visual inspection of the correlation matrices reveals a striking similarity in the overall pattern of correlations, in spite of their origin in three different language areas and an even larger number of different cultures. This overall impression should be kept in mind when interpreting the formal comparative analysis.

The formal test consists of six steps. In Step 1, it is assumed that both structural and measurement parameters are identical across countries and regions. In the following steps, this assumption is relaxed.

The question of the highest theoretical relevance in this context is whether the structure of the motivational antecedents to paying attention to eco-labels differs between countries. This is analysed in Step 5. The change in χ^2 found in this step is not significant. Hence, the structure of the determinants of paying attention to eco-labels found in the analysis of West German data has indeed cross-national generality.[10] This does not mean that there are not variations in these path parameters between countries and regions (see Table IV). However, only one of the estimated path parameters conflicts with the hypothesis that the influence of the two more general motivational antecedents is mediated through the two more specific ones (a significant path from PCE to paying attention in Great Britain). Further, the differences are not statistically significant overall, as seen in Table III.

Returning to Table III, it appears that in spite of the similarities there are a number of significant differences between the country samples. First, in Steps 2 and 3, it is controlled whether the "observed"

TABLE III
Differences in Determination of Paying Attention to Eco-Labels in West Germany, East Germany, Great Britain, Ireland, and Italy (N = 3,624)

Step#	χ^2	df	$\Delta\chi^2$	df
1	361.2	157		
2	331.7	145	29.4	12
3	298.9	125	32.8	20
4	231.2	101	67.7	24
5	207.0	85	24.2*	16
6	196.47	81	10.5	4

* Not significant at $p < 0.05$.

TABLE IV
Determinants of Paying Attention to Eco-Labels in West Germany, East Germany, Great Britain, Ireland, and Italy (N = 3,624)

Country/region	Belief in buying strategy	Trust	Pro-environmental attitude	PCE	ζ
West Germany	0.86 (9.97)*	0.35 (7.80)	–0.08 (–1.55)	–0.03 (–0.89)	0.39
East Germany	0.78 (8.41)	0.30 (5.85)	0.07 (1.31)	0.05 (1.29)	0.48
Great Britain	0.89 (10.15)	0.33 (6.27)	0.00 (0.07)	–0.14 (–3.47)	0.27
Ireland	0.83 (7.42)	0.30 (4.35)	0.05 (0.68)	0.02 (0.36)	0.39
Italy	0.66 (6.57)	0.34 (6.50)	0.03 (0.52)	–0.03 (–0.64)	0.56

* *t*-values in parentheses.

variables are perceived identically by individuals in different countries and regions. In Step 2, factor loadings on the latent variables (λ), and in Step 3, the error variances of the individual measures (θ) are allowed to vary. Both steps produce a significant improvement in χ^2, thus rejecting the assumption that the observed variables are perceived totally identically by individuals in different countries and regions. Apparently, individuals in different countries neither hold totally identical perceptions of the basic meaning of the questions (the significant change in χ^2 in Step 2), nor hold these perceptions with equal certainty (the significant change in Step 3). Hence, we are reminded that the interpretation of questions in a questionnaire depends on language, culture, and history. This implies, among other things, that if these effects are not controlled, differences that are found in the assumed causal paths may not have substantive roots, but may just reflect differences in the understanding of questions.

In Steps 4 to 6, the structural parameters, i.e., the covariances of the latent independent variables (Step 4), the paths from independent to dependent variable(s) (Step 5, as already commented), and the structural equation's error variance (Step 6), are allowed to vary between countries and regions. The significant change in χ^2 in Step 4 shows that correlations between motivational antecedents differ between countries and regions. The significant χ^2 change in Step 6 indicates that there are also differences between countries and regions as to how much of the variation in paying attention to eco-labels is explained by motivational antecedents (and, by implication, how much is explained by internal and external restrictions and other non-measured variables). Table IV shows that among these countries and

regions, the motivational antecedents explain from 44 to 73% of the variation in paying attention to eco-labels, most in Great Britain and least in Italy.

Possible interactions between pro-environmental attitude and other motivational antecedents of paying attention to eco-labels are detected by means of hierarchical regression analysis (Aiken & West, 1991). This method involves a series of multiple regression analyses, including first only direct effects and then the product(s) of variables assumed to interact. For this purpose, multi-item indicators are summed and all independent variables centred.

According to the analytical framework generating the hypothesis that some motivational antecedents may interact in their influence on paying attention to eco-labels, such interactions are caused by variables moderating the influence of an attitude on attention and behaviour. Hence, in these calculations pro-environmental attitude assumes the role of main determinant and other motivational antecedents the role of moderators. The possible moderator effect of a variable is calculated in two steps. First, the variable is included in the multiple regression analysis as an additional independent variable. Next, the product of this variable and the pro-environmental attitude is included as yet another independent variable. In the first of these steps the main effect, and in the second step the interaction effect of the additional variable with the main independent variable(s), are analysed. The strength of the alleged moderator variable is measured by the change in the overall coefficient of determination (ΔR^2, adjusted) that it leads to and its significance is tested by the F-change test.

The hypothesis that a possible moderator variable moderates the relationship between pro-environmental attitude and paying attention is confirmed if the inclusion of *the interaction term* leads to a significant increase in the coefficient of determination. The results of the hierarchical regression analysis are reported in Table V.

It appears from Table V that there are few interaction effects among the included variables. Only trust in the label acts as a moderator of the relationship between pro-environmental attitude and paying attention towards eco-labels and only in three of the five cases. In all the three cases, the sign of the interaction term is as expected, i.e., the influence of pro-environmental attitude is stronger among consumers who trust the label than among those who do not.[11]

TABLE V
Hierarchical Regression Analysis of Possible Interactions Between Pro-Environmental Attitude and Other Motivational Antecedents of Paying Attention to Eco-Labels

Independent variable(s):	0: p-e attitude	1.1: p-e attitude, belief in buying	1.2: p-e attitude, belief in buying, product term	2.1: p-e attitude, trust	2.2: p-e attitude, trust, product term	3.1: p-e attitude, PCE	3.2: p-e attitude, PCE, product term
West Germany	N =	946		848		932	
Adj. R^2	0.053	0.330	0.332	0.214	0.216	0.090	0.089
ΔR^2		0.277	0.002	0.161	0.002	0.038	–0.001
F-value			3.017		2.411		–0.999
East Germany,	N =	987		879		959	
Adj. R^2	0.042	0.260	0.260	0.183	0.193	0.049	0.048
ΔR^2		0.218	0.000	0.141	0.009	0.007	0.000
F-value			–0.027		10.179*		–0.451
Great Britain,	N =	1158		930		1115	
Adj. R^2	0.110	0.388	0.387	0.279	0.280	0.126	0.126
ΔR^2		0.278	–0.001	0.169	0.001	0.017	–0.001
F-value			–0.942		1.608		–0.940
Ireland,	N =	936		644		932	
Adj. R^2	0.078	0.307	0.307	0.252	0.277	0.103	0.102
ΔR^2		0.229	–0.001	0.174	0.025	0.024	–0.001
F-value			–0.941		22.365**		–0.971
Italy,	N =	944		771		938	
Adj. R^2	0.049	0.163	0.163	0.175	0.186	0.057	0.056
ΔR^2		0.113	0.000	0.125	0.011	0.007	–0.001
F-value			–0.191		10.293*		–0.970

* $p < 0.01$.
** $p < 0.001$.

SUMMARY AND IMPLICATIONS

Based on the conviction that environmental labelling schemes are potentially useful tools in environment policy, but that they are of no use if they are not noticed by the consumer in the shopping

situation, this paper deals with the issue of what makes consumers pay attention to eco-labels. It is suggested that "paying attention to eco-labels" is hardly a goal in itself, but rather a means to a goal: buying environment-friendly products, which is a means to a more abstract goal about protecting the environment. Hence, it is unlikely that a consumer pays attention to an environmental label unless he or she values protecting the environment, perceives buying (more) environmentally friendly products as an effective means to achieve this goal, and perceives the information that the label conveys as useful for this purpose. In addition, the availability of eco-labelled products in the shops and the consumer's ability to recognise and understand them undoubtedly influences attention towards this type of labels.

A model of consumer attention towards eco-labels is developed and the motivation-attention part of the model is tested by means of data from a number of European counties. Due to lack of data, the importance of the availability of eco-labelled products in the shops and of the consumer's ability to recognise and understand them is not included in the test. It is a major strength of this study that key findings are replicated in five countries. Its major weaknesses are the missing variables and that the quality of some of the empirical indicators leaves a lot to be desired. The uncertainty produced by these weaknesses should be kept in mind when interpreting the results.

A large majority of the consumers in all the analysed countries pays attention to eco-labels at least sometimes. As predicted, paying attention to eco-labels is strongly influenced by the belief in considerate buying as a means of protecting the environment and by the trust in the labels in all the included countries and regions. The personal importance of environmental protection (pro-environmental attitude) and perceived effectiveness as regards solving environmental problems also influence paying attention to eco-labels, but this influence is mediated through the former two concepts. In three of the five analysed countries and regions there is also an interaction effect between pro-environmental attitude and trust, meaning that the influence of pro-environmental attitude on paying attention is higher when the consumer trusts the label (and the influence of trust higher when the consumer holds pro-environmental attitudes). From 27 to 56% unexplained variance indicates that important determinants are missing from the test, as we are well aware.

The missing variables notwithstanding, the study has important policy implications. Particularly, it documents that the usefulness of

eco-labels as a policy tool depends on the credibility of such labels and, with reservations following from our use of a somewhat imprecise measurement instrument, on consumers being convinced that their purchase behaviour has environmental significance. Of course, it only shows that these variables are necessary, not that they are sufficient conditions for achieving environmental policy goals by means of this instrument.

This study gives empirical support to the frequently expressed assumption that consumers pay attention to and use labels in their buying decisions only if they trust them. Hence, it is of utmost importance to supply and use labels that consumers feel they can trust and to promote the labels in a way that builds trust. This study shows that a consumer's trust in an environmental label to some degree is coloured by, and that its effect on paying attention to the label in some cases in influenced by, his or her attitudes. However, none of these effects are strong.

The fundamental requirements for achieving credibility are obviously not covered by this study. According to a large number of studies, the most important requirement is that the label is issued and controlled by a public or independent authority, a so-called "third party" (e.g., Eden, 1994/95; Enger & Lavik, 1995; MacKenzie, 1991; Schlegelmilch et al., 1996; Tufte & Lavik, 1997). Unfortunately, such labels are currently outnumbered many times by producers' private environmental claims (Enger, 1998; Mayer & Gray-Lee, 1995). This situation can hardly be avoided. However, due to previous lack of discipline among producers, consumer trust in producers' private green claims has been undermined (Peattie, 1995), and due to widespread consumer uncertainty about who issues public and independent labels, such as the Swan, the credibility of such labels has also been hurt (Tufte & Lavik, 1997).

There is no doubt that producers now are more cautious about using green claims than they were in the beginning of the nineties (e.g., Mayer & Gray-Lee, 1995), among other things because regulatory authorities in many countries as well as international bodies such as the ICC and the ISO-organisation have now issued guidances on the use of green claims in marketing (Kuhre, 1997). As a result of this and of the greater prevalence of "third party" eco-labels (see Table I), consumer trust in green claims seems to be improving (cf., e.g., Konsumentverket, 1995/96, 1998). However, a recent Norwegian study documents that the credibility of "third party" eco-labels needs to

be strengthened and maintained by means of supportive information (Tufte & Lavik, 1997).

Another important contribution of this study is the proposition and empirical documentation that paying attention to and using eco-labels depends on the priority the consumer gives to the goal of environmental protection and on his or her belief in environment-friendly buying as a strategy to achieve this goal. The study shows that consumer belief in responsible purchase behaviour as a means of achieving environmental goals depends partly on pro-environmental attitude and partly on personality traits (perceived effectiveness).

Both of these results make sense and should be acknowledged. They imply that environmental labelling schemes are a supplement to – not a substitute for – general environmental awareness and self-confidence enhancing information and education efforts. But it should also be noticed that together the two variables leave most of the variation in consumer beliefs about this issue unexplained. As discussed in connection with Figure 1, there are other important determinants that were, unfortunately, not measured in the survey. It should be rather self-evident that consumer belief in the environmental significance of responsible purchase behaviour depends on their knowledge about eco-labels. Such knowledge may stem both from consumer education about the issue and from contact with eco-labelled products. Nilsson et al. (1999) suggest that the labels and labelled products themselves and their immediate surroundings in the shops are the most important sources of learning about eco-labels – what a label looks like, what it means, which types of products and environmental problems it is relevant for, etc. Hence, the proper education of consumers about eco-labels first and foremost depends on increasing the prevalence of eco-labelled products in the shops.

The availability of environmentally differentiated (i.e., eco-labelled) products in the retail sector may, in fact, be the most important key to increasing the attention paid to eco-labels. A strong prevalence of eco-labelled products not only makes eco-labels easier to notice by chance and, as just mentioned, facilitate consumer learning about eco-labels. In addition, it is likely that consumer belief in the environmental significance of responsible purchase behaviour is strengthened by a strong prevalence because it makes it more credible that consumers can make a difference by choosing such products. Hence, future empirical studies should address the key issue of the availability of environmental labels and its effects.

APPENDIX: POLYCHORIC CORRELATION MATRICES BY COUNTRY

	Atten	Pro1	Pro2	Pro3	PCE	Orga	Pack	Trust
West Germany								
Atten	1.00							
Pro1	0.21	1.00						
Pro2	0.10	0.75	1.00					
Pro3	0.23	0.62	0.59	1.00				
PCE	–0.23	–0.21	–0.15	–0.32	1.00			
Orga	0.42	0.16	0.14	0.16	–0.24	1.00		
Pack	0.54	0.28	0.20	0.29	–0.20	0.43	1.00	
Trust	0.52	0.07	0.03	0.11	–0.04	0.15	0.20	1.00
East Germany								
Atten	1.00							
Pro1	0.16	1.00						
Pro2	0.19	0.70	1.00					
Pro3	0.20	0.62	0.61	1.00				
PCE	–0.14	–0.22	–0.16	–0.28	1.00			
Orga	0.35	0.03	0.07	0.14	–0.09	1.00		
Pack	0.48	0.16	0.10	0.23	–0.27	0.38	1.00	
Trust	0.51	0.15	0.15	0.13	–0.03	0.20	0.23	1.00
Italy								
Atten	1.00							
Pro1	0.20	1.00						
Pro2	0.17	0.64	1.00					
Pro3	0.20	0.50	0.54	1.00				
PCE	–0.09	–0.10	–0.07	–0.23	1.00			
Orga	0.26	0.09	0.08	0.15	–0.04	1.00		
Pack	0.35	0.21	0.12	0.18	–0.04	0.11	1.00	
Trust	0.47	0.13	0.11	0.16	–0.08	0.22	0.13	1.00
Ireland								
Atten	1.00							
Pro1	0.31	1.00						
Pro2	0.17	0.66	1.00					
Pro3	0.23	0.66	0.65	1.00				
PCE	–0.16	–0.29	–0.11	–0.24	1.00			
Orga	0.33	0.12	0.13	0.12	–0.07	1.00		
Pack	0.49	0.18	0.16	0.20	–0.14	0.26	1.00	
Trust	0.57	0.27	0.16	0.21	–0.12	0.14	0.29	1.00
Great Britain								
Pro1	0.28	1.00						
Pro2	0.27	0.81	1.00					
Pro3	0.33	0.66	0.72	1.00				
PCE	–0.28	–0.27	–0.27	–0.34	1.00			
Orga	0.41	0.21	0.17	0.21	0.00	1.00		
Pack	0.57	0.18	0.17	0.23	–0.11	0.38	1.00	
Trust	0.60	0.17	0.15	0.22	–0.25	0.18	0.30	1.00

Atten = Paying attention to eco-labels. Pro1-Pro3 = Pro-environmental attitude. Orga-Pack = Belief in buying as a means of protecting the environment.

NOTES

[1] Some environmental labels were known even earlier, for instance labels certified by bio-dynamic growers' associations in several countries, hazard labelling, and report cards (EPA, 1998), but the knowledge about them enjoyed a very limited diffusion in any society.

[2] Whereas the Swan label was introduced in the other Nordic countries in 1989, Denmark only became a full member of this labelling scheme at the end of 1997, which undoubtedly explains the difference.

[3] Much more could, of course, be said about the importance of personality factors in this connection.

[4] Framed within a general attitude-behaviour relationship discussion, similar ideas have been suggested by Guagnano, Stern, and Dietz (1995) and Ölander and Thøgersen (1995).

[5] Knowledge about labelling schemes most likely influence both a consumer's belief in cautious buying as a strategy to achieve environmental goals and his or her trust in the labels. Also, by conveying information about opportunities for environment-friendly buying, the availability of labelled products may influence consumers' beliefs in cautious buying as a strategy to achieve environmental goals.

[6] Dual process models of decision-making, such as Fazio's (1990) MODE model, suggest that thorough, or deliberative, decision-making requires that the individual is motivated, able, and has the opportunity to spend time and effort on deliberating. If any of these requirements are missing, a more spontaneous decision-making mode will be applied. This is the case for low-involvement decisions, for instance. Fazio's (1986) attitude-to-behaviour theory is a model of spontaneous decision-making.

[7] COMPASS was founded by the European Union. It comprises five specialist social survey research organisations: EURISKO, Milan, Italy; Instituut voor sociaal-wetenschappelijk Onderzoek (IVA), Tilburg, the Netherlands; Social and Community Planning Research (SCPR), London, UK; Social Science Research Centre (SSRC), Dublin, Ireland; and Zentrum für Umfragen, Methoden und Analysen (ZUMA), Mannheim, Germany. The work programme was called "Research into Environmental Attitudes and Perceptions in Five EU Countries" (REAP). Main topics include energy use in the home, automobile use, household waste management, and environmental labelling. More details about the procedure and design are reported in Witherspoon and Mohler (1995), which can be downloaded from the internet address www.zuma-mannheim.de/cooperation/en/compass/reap.htm.

[8] Labels issued by organic and bio-dynamic growers' organisations have been used in the marketing of pesticide and chemical free vegetables for decades, but at the time of this survey they played a marginal role in the covered countries. Making an effort in this regard would instead involve going to speciality shops or farmers' markets.

[9] Notice that the size of the correlation may be attenuated in cases where one or both of the latent variables are measured with only one item. Hence, the evidence supporting discriminant validity is tentative in these cases.

[10] Only the equation analysing the direct paths from the four antecedents to paying attention is included in the multiple sample analysis.

[11] In the interest of saving space the parameters of the equations are not shown, but they can be acquired from the author on request.

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