Are you telling me the truth?

Authenticity of responses in virtual worlds research.

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Abstract

Basing on social response theory of consumer behavior, which predicts that the use of social cues in human-computer interaction elicits more sincere responses (Moon 2000; Moon 2003), and recognizing that the social dimension is dominant in virtual worlds' interactions, we hypothesize that virtual worlds are externally valid contexts for marketing research.

We test our hypothesis comparing answers provided in a virtual world context to answers provided in a real context on two heuristics: evaluation and choice. Evidence obtained from two studies supports the external validity of virtual world setting for marketing research both when participants are asked to perform an evaluation and when participants are asked to make a choice.

Keywords: Virtual Worlds, Authenticity, Social Interaction, External Validity, Evaluation, Choice

"*Give him a mask, and he will tell you the truth.*"

Oscar Wilde

Introduction

Virtual worlds are computer-generated worlds populated by avatars, or personified graphical representations or characters (Holzwarth, Janiszewski and Neumann 2006). Avatars have been described as pictorial representation of humans in a chat environment, which is a computer-based environment where people socialize in real time using the written language and symbols typed on a PC keyboard to communicate. Thus, virtual worlds can be considered an evolution of web-based peer-to-peer social environments, but with increased potential for communication due to the availability of a three-dimensional graphical interface which permits enhanced and richer forms of exchange and interactions among participants.

Recently virtual worlds have become extremely popular, engaging millions of participants over the globe. Such a growth is catching the attention of researchers (Novak 2008), companies (Business Week 2006) and governments (The Guardian 2007) to seek opportunities for education, research and business. Given the striking resemblance of behaviors enacted within virtual worlds to real behavior, the opportunity to use virtual worlds as subject pools for research sounds like a very promising venue for many social scientists (Bailenson 2007). We consider this possibility worth of investigation, and in this paper we try to assess the use of virtual worlds as viable settings for marketing research.

Research in the virtual worlds has advantages over both traditional studies (cost advantages) and pure web-based studies (control advantages). More specifically, research in virtual worlds overcomes the trade-off between the efficiency of online surveys and the efficacy of traditional research, qualifying as a potential breakthrough innovation in the social sciences (Bainbridge 2007). Moreover, the interest in using virtual worlds as research settings grows as virtual worlds simulate the conditions of real systems under many dimensions (Bloomfield 2007), allowing for psycho-physical, economic and social behaviors which mimic real life behaviors (Bailenson et al. 2006; Miller 2006; Chesney, Chuah and Hoffmann 2007; Gorini, Gaggioli and Riva 2007; Yee et al. 2007).

If the rise of virtual worlds presents unique opportunities for innovative research methods (Hemp 2006, Novak 2007), on the other hand there are caveats hindering concurrent development of marketing research. This paper addresses one of the main limitations of

virtual worlds marketing research: the authenticity of responses. Such a risk is not much inherent with the absence of physical contact with the responder, which is in fact common to established research methods (e.g., phone interviews and with a higher degree web surveys), and not even with the aspiration to obtain absolutely honest answers - which not even the most controlled form of inquiry can secure. The problem of authenticity, as we define it, is more concerned with the relationship between the avatar (i.e., the representation of the self within the virtual world) and the person. If on the one side many behaviors enacted in virtual worlds mirror reality, virtual worlds are not "real". Virtual worlds avatars' can chose their physical resemblance (Novak 2008), can perform activities which cannot naturally be done (e.g., flying), and can also engage in noxious form of consumption whose owners hopefully turn to avoid in real life (e.g., smoking, sexual or violent behavior, etc.). Behavior in the context of virtual world is truthful, but we do not know if such authenticity is valid only within the boundaries of virtual world, or if it corresponds and is consistent to intentions and behaviors "out-world". Answering such a question would tell us if social research in virtual worlds could be considered reliable, and we could evaluate its potential impact on marketing research.

In the subsequent sections we first review relevant literature supporting the external validity of responses from survey participants in virtual worlds. We then present two studies. In the first study we compare evaluations on environmental safety from three separate samples. The first two are subsamples of a greater sample of participants who answered to a questionnaire fully structured within the virtual world Second Life, the second is a sample of students who answered to the same questionnaire in a classroom. In the second study we compare choices of the favorite president of the Italian government expressed in the virtual world during the last political campaign with the actual results of the national elections. We finally discuss the results.

Conceptual development

As researches find out that social, psycho-physical and economic behaviors enacted in virtual worlds are consistent with real life (Miller 2006; Gorini, Gaggioli and Riva 2007), there is inherent interest to realize how to leverage these enhanced research settings to further consumer knowledge (Hemp 2006).

A striking resemblance between real and virtual worlds' behaviors has been recorded by Yee and others (2007), who found that people maintain a certain distance while talking to each other, and that female-female pairs made more eye-contact and stand closer together as they

interacted, just as in the real world. Thus a perception of spatial distance and more importantly proxemics rules are imported from real to virtual worlds interactions. In another study, Yee and Bailenson (2007) found behavior resemblance concerning touch. People applied a softer strength (measured using a sensitive joystick), when asked to touch a body than when they were asked to touch an unanimated object. Differences were also noticed with different parts of the body (softer touch for face compared to torso), and sex (softer touch for female than male). Chesney Chuah and Hoffmann (2007) reported that economic behavior tested in a series of experiments (games) in the virtual world Second Life is non-deviant from other lab and field experiments of the same type which can be found in the economic literature.

Further than consistency of one-to-one social interactions, psychophysical and economic behavior, a relevant issue for marketing researchers is to establish the reliability of virtual world's research, that is, to what degree one can expect that the answers given in a virtual world reflect real opinions. Two intertwined factors support the external validity of virtual worlds as research settings. The first factor is inherent to the social response theory (Reeves and Nass 1996), which contends that in a computer mediated context the use of social cues (i.e., language, human voice, interactivity, social role and etc.), elicits authentic responses (e.g., self attribution of responsibility for negative outcomes) (Moon 2000; Moon 2003) and promotes behavior which regularly occur in human-human interactions (Wang et al. 2007). The effect of social response elicitation in human-computer interactions has been largely supported in the context of commercial websites, where the presence of an avatar during the interaction enhanced the perception of reciprocity and friendliness (Holzwarth, Janiszewsky and Neumann 2006). Together, these researches support that ordinary social behavior applies to avatar-mediated interaction and, therefore, in the context of virtual worlds.

The second subsequent factor supporting the external validity of virtual worlds as research settings is that virtual worlds are much richer than the traditional online websites, at least under three important aspects (Massara and Novak 2008):

1. Virtual worlds are becoming densely populated societies, with complex social interactions at the very basis of their evolution. Knowledge sharing and creation (i.e., user generated content) is in fact at the core of the new web paradigm that encourages users' interaction for generation of original contents (Schipul 2006). If virtual worlds can only but simulate the realism of physical places, the social interactions within them are real, and currently attracting the attention of scholars from different disciplines, such as legal (Grimmelmann 2004), psychology (Gorini, Gaggioli and

Riva 2007), sociology (Bainbridge 2007), economics (Chesney Chuah and Hoffmann 2007), and communication (Yee et al. 2007).

2. Virtual worlds such as Second Life support internal economies with convertible currencies, intellectual property and free market exchange. The main effect of this characteristic is increased realism and higher and justified motivation to play (Ondrejka 2007). Earning a salary in the virtual world, for example through research incentives, gives the player purchasing power within it. On the other hand, there is a risk that virtual worlds will encourage the profession of the "survey responder", the negative side of it being increased participant opportunism (Sparrow 2007). Unfortunately this problem has hindered traditional online attitudinal research, and can severely hamper the development of this type of research in virtual worlds. To deal with such a problem it will be necessary to continuously check for participants' motivation, controlling for the accuracy of their answers.
3. Virtual worlds empower human-computer interaction with a visual technology which permits an immersive experience in a completely new way compared to the incorporeal text-based cyberspace. Researchers found that avatars' appearance within the virtual world influences avatar behavior. More precisely, a more attractive look influences likeability (Holzwarth, Janiszewsky and Neumann 2006) and self-confidence of one avatar (Yee and Bailenson 2007).

Since virtual worlds adds socio-economic contents and enhance the sensory experience with respect to the traditional web, the tenets of social response theory should confidently apply to a virtual world context. Hence, since social rules apply to general human-computer interaction, and since virtual worlds provide such a vivid representation of real world, we expect that behavior in virtual world is truthful, that is, it reflects real behavior. Thus, we predict that opinions provided in the context of a virtual world should not be different respect to those provided offline, that is, virtual world answers will be externally valid.

Study 1

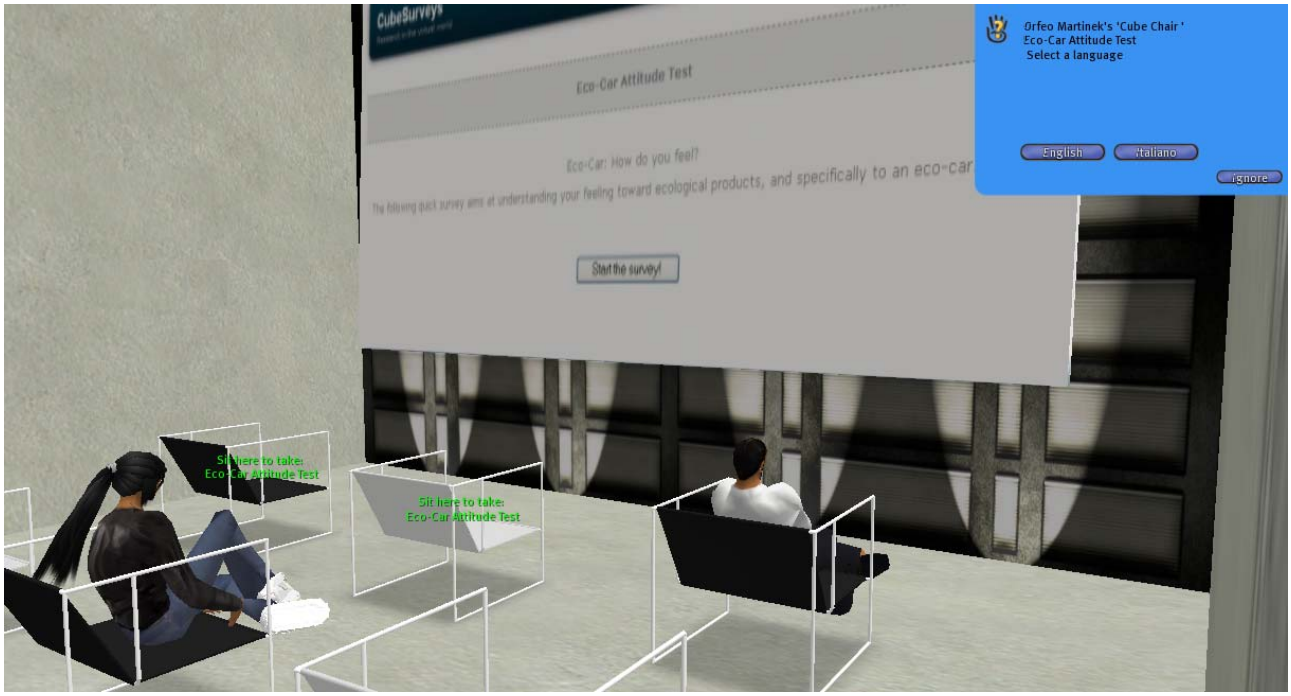
Method

We conducted a survey on a bipartisan socially relevant issue (i.e., adoption of an eco-car) in two different contexts: in the virtual world Second Life, and offline, in a classroom. Online participants were recruited through announcements both within the virtual world and on websites dedicated to the virtual world. Avatars were offered compensation in Linden Dollars (i.e., the internal currency of the virtual world Second Life) for participation. Participants

visited a virtual consumer lab located in Second Life, which was given the fantasy name of Cubesurveys (see Figure 1).

Figure 1. A view of the consumer lab Cubesurveys in Second Life

Figure 2. Two avatars completing the survey



Approaching the consumer lab participants were directed to one of the cubicles where the survey apparatus was set up. Once there, avatars were invited to participate to the survey (see Figure 2). After selecting the language between Italian or English on a pop-up window the survey opened up in a web-browser window. After completion each avatar was enabled to redeem the credit.

In 3 months a total of 2785 participants from everywhere in the world took part to the survey. We do note that the majority of participants (56%) were Italians, probably because we used mainly Italian forums to advertise the research. To control for opportunistic behavior of participants who could, for example, answer inaccurately just to cash in the promised reward, we traced covertly the time of the answers for every webpage of the questionnaire. At pre-test no less than 2 minutes were necessary to speedily read and answer to the overall questionnaire. We then eliminated all the questionnaires completed in less than 2 minutes. The average time for the Italian online sample was of 3'45'', the average time for the International sample was of 4'04''. We eliminated a total of 575 questionnaires, that is, almost the 21% of the sample. The overall sample was thus composed of 2200 valid questionnaires, with the proportion of the Italian subsample rising to 67%, with 1480 questionnaires. The remaining 720 international participants were mostly Europeans (50%), North Americans (28%) and South Americans (10%).

The offline sample is composed of 186 questionnaires which were collected in classrooms of four Italian universities during the same period of time of the online study. Offline participants were students, all in the age range 20-29 and mostly females (69%). Since age differentiated significantly the answers of the Italian online subsample, although it did not in the international online subsample, we decided to restrict our analysis to the age class 20-29 for both the online subsamples. In the Italian and international online subsamples females were less than males (41% and 46% respectively). We obtained the time required for completion by asking participants to indicate the time at the beginning and at the end of the questionnaire. The average time required for completion was slightly higher for offline participants with 5'20'' (F (2, 1080) = 30.45; $p<0.1$). However, gender did not produce significant differences across the three subsamples for none of our measures. The final sample was composed of 1082 valid questionnaires: 186 of these are offline Italian participants (Sample 1), 560 are online Italian participants (Sample 2) and the remaining 336 are international online participants (Sample 3).

Measures

We developed our questionnaire on the theme of environmental safety, a socially relevant issue which is known extensively. The introduction to the questionnaire revealed that the intent of the study was to measure ecological behavioral intentions (i.e., switch to an eco-car). We used extant measures of environmental consciousness developed by Kaiser, Wolfing and Fuhrer (1996). We measured general knowledge of environmental issues with 2 dichotomous items. Attitude towards environmental safety was measured with 5 items on a 9-point Likert scale. The value concerning beliefs about the importance of environmental issues was measured with 4 dichotomous items. Finally behavioral intentions with a single question on a 9-point Likert scale (see Appendix A). The measures of knowledge and values were calculated by summating item ratings. Exploratory and confirmatory factor analysis as well as reliability analysis of the environmental attitude scale conducted on the overall sample and on the three subsamples separately suggested to keep only 2 of the initial 5 items (Alpha = 0,62 ; Extracted Variance = 72.6%).

For the Italian questionnaire, we translated the scales using procedures previously employed in marketing research (Babin, Griffin and Modianos 2000). We first had the items translated in Italian by a native speaker. An English native speaker back-translated the scales into English, which were then compared with the original to find no relevant differences. This procedure ensured translational equivalence for the scale items.

Results

Construct means, standard deviations and correlation coefficients for the three samples are shown in Table 1.

Comparison of descriptive statistics reveal slightly different levels across the three samples, however, the structure of the causal relationships among the constructs is fairly constant. Correlations among the variables show consistency across the three samples, the only differences being: 1) the non-significance of the relationship between knowledge and values for Sample 1; and 2) the significant correlation between environmental attitude and behavioral intentions for the international sample.

To test our hypothesis of external validity of virtual worlds as research settings we constructed a regression model with behavioral intentions as dependent variable and knowledge, environmental attitude and values as explanatory variables. If the causal structure among the constructs is found consistent across the three samples then the research setting under investigation possesses external validity (Shadish, Cook and Campbell 2002), at least

limitedly to the causal inference investigated (i.e., explanation of behavioral intentions concerning environmental issues).

Table 1. Descriptive Statistics and Pearson Correlations

Sample 1 (offline Italian participants) – N = 186

Construct	Mean	SD	(BI)	(K)	(A)	(V)
Behavioral Intentions (BI)	6.83	2.48	1	0.07	-0.1	0.22**
Knowledge (K)	1.82	0.40		1	0.05	0.13*
Attitude (A)	-0.12	0.94			1	0.10
Values (V)	3.10	0.82				1

Sample 2 (online Italian participants) – N = 560

Construct	Mean	SD	(BI)	(K)	(A)	(V)
Behavioral Intentions (BI)	7.46	2.46	1	-0,01	0.05	0.22***
Knowledge (K)	1.70	0.53		1	-0.03	0.09*
Attitude (A)	-0.21	0.93			1	0.11**
Values (V)	2.92	0.92				1

Sample 3 (international online participants) – N = 336

Construct	Mean	SD	(BI)	(K)	(A)	(V)
Behavioral Intentions (BI)	6.85	2.49	1	0.08	0.31***	0.25***
Knowledge (K)	1.59	0.59		1	-0.04	0.10*
Attitude (A)	0.43	1.00			1	0.11*
Values (V)	2.62	1.02				1

* $p<0.05$
** $p<0.01$
*** $p<0.001$

Table 2 summarizes the results of the linear regressions. Despite the weakness of the relationship between dependent and independent variables we note a perfect correspondence in the results of the regression analysis between Sample 1 and Sample 2. Here the sign of the parameter estimates and their significance matches exactly. Additionally, the independent variables exert the same level of influence on the independent variable, that is, the marginal effects of the independent variables on the dependent variable are equal. Sample 3 differs in that attitude is a significant predictor of behavior, but we do note the same perfect correspondence between sign of the parameters, significance levels and the marginal effects of the independent variables on the dependent variable. Since Sample 3 is an international

sample the difference with the Italian samples can be in a sense understood, although it is out of the scope of this paper to justify theoretically such a result.

Table 2. Results of regression analyses

Sample 1 (offline Italian participants) – N = 186

	Independent Variable			
Dependent Variable	**(K)**	**(A)**	**(V)**	**R^2**
(BI)	0.05_{ns}	-0.04_{ns}	0.22**	0.05

Sample 2 (online Italian participants) – N = 560

	Independent Variable			
Dependent Variable	**(K)**	**(A)**	**(V)**	**R^2**
(BI)	-0.03_{ns}	0.02_{ns}	0.22***	0.05

Sample 3 (international online participants) – N = 336

	Independent Variable			
Dependent Variable	**(K)**	**(A)**	**(V)**	**R^2**
(BI)	0.07_{ns}	0.28***	0.22***	0.14

ns = non significant
* p<0.05
** p<0.01
*** p<0.001

Therefore, we found support for our hypothesis that inferences about cause-effect relationships from researches in virtual worlds can be generalized to other settings.

Study 2

In study 1 we find that causal relationships among the constructs investigated are identical between two of the three samples, and fairly stable if we consider all the three samples. However, we note that this evidence is limited to an evaluation on a general bipartisan problem (i.e., environmental safety). Participants were simply asked to express a certain level of agreement with respect to an issue, heuristically an evaluation. In marketing research, investigating evaluations is important and instrumental to predict choice (Kraft, Granbois and Summers 1973), in fact marketing and consumer researchers have often to do with

experimental situations where consumers are asked to express a precise preference. Hence, we need to make a step further to seek whether the consistency of behavior between real and virtual world is confirmed in choice situations, that is, where the heuristic is not just to make an evaluation, but a neat choice.

Method

In study 2 we compare preference for political candidates to the presidency of the Italian government expressed in the virtual world with the actual results of the national elections.

As in the first study, we used the consumer lab platform Cubesurveys based in the virtual world Second Life. We polled avatars' preference for the presidency of the Italian government within a set of six possible candidates. This happened one month before the Italian political elections, in the core of the political campaigns.

Figure 3. The apparatus set up for the political polls in the consumer lab Cubesurveys.

The recruitment procedure was similar to the first study. Participants were recruited through announcements and were offered compensation in Linden Dollars. The procedure was very simple. Approaching the consumer lab participants were directed to one of the cubicles where the apparatus was set. Once there, avatars were invited to participate to the poll. They had to follow a brief set of instructions until they were enabled to participate. In order to vote avatars

had to click on a photo of the preferred candidate (see Figure 3). After voting the avatars were credited an amount of Linden Dollars.

The sample is composed of 600 Italian participants and 524 international participants.

We recorded the nationality of the avatar, and their preference for one among 6 possible candidates.

Results

Table 3. Virtual world preferences expressed one month before the elections vs. actual results.

	Online Italian participants – N = 600	Online international participants - N = 524	Actual results of elections
Candidate 1	36.3%	22.3%	46.8%
Candidate 2	29.0%	24.4%	37.5%
Candidate 3	8.5%	17.9%	5.6%

Table 3 compares the results of the polls from the Italian and international online samples against the actual results of the elections for the first three candidates in the real elections.

The international sample was unable to express a solid preference towards one candidate. Further, the preferences for Candidate 1 and Candidate 2 are reversed if compared to the results of the actual results of the elections. The inability to express a clear preference from the international sample reflects obvious differences with the Italian sample at the time of the survey. The international participants were not involved in the choice as the Italians; they did not have the same knowledge of the candidates and further, they were not exposed to the same media pressure as the Italian participants were at the time of the survey.

On the other hand, the preference expressed by the Italian online sample reflects the ranking of actual results and further, the distance among the candidates is consistent with the results of the real elections. This result is therefore consistent with our hypothesis of external validity of virtual worlds as research settings.

Discussion and conclusions

Basing on social response theory of consumer behavior, which predicts that the use of social cues in human-computer interaction promotes more sincere responses (Moon 2000; Moon 2003), and recognizing that the social dimension is dominant in virtual worlds' interactions, we hypothesize that virtual worlds are externally valid contexts for marketing research.

We test our hypothesis comparing answers provided in a virtual world context to answers provided in a real context on two distinct heuristics: evaluation and choice.

We find that our hypothesis is supported for evaluations since we discover that opinions on the general bipartisan issue of environmental safety from a sample of participants in a virtual world are highly consistent with opinions surveyed offline from a similar sample. More precisely, we find that the causal relationships among the constructs investigated are basically identical between two of the three samples, and fairly stable if we consider all the three samples.

We also find evidence that the virtual context does not distort the results with respect to reality in a choice situation, where we find consistency between virtual and real preferences on a delicate topic such as the choice of a candidate for the presidency of the government when political elections are approaching.

Although we report a high correspondence between answers given in a virtual and a real context in two distinct situations, we do observe that these are not exhaustive of all possible cases. For example, our evidence is limited to situations where the answer, being it the result of evaluation or choice, 1) does not have any direct personal implications; and 2) carries a low level of risk. Since avatars' appearance has been found to increase likeability and self-confidence, affecting behavior in certain situations, for example during negotiations (Holzwarth, Janiszewsky and Neumann 2006; Yee and Bailenson 2007), we expect that avatar-mediated interaction can, at times, change the results of an interaction. We therefore recommend qualitative researches (e.g., focus groups) in virtual and real worlds to be compared, to see whether the results of avatar-mediated social interactions match with the recorded results of real interactions.

Another consideration that needs to be done is that both studies compared online and offline answers on socially relevant issues, but we did not consider, if not indirectly, self judgments (e.g., self-attributions of responsibility). Bessière, Seay and Kiesler (2007) found that players of multiplayer online games expressed more favorable evaluation for their avatars than they did for themselves. More precisely they revealed that their avatar was more similar to their ideal self than they themselves were. Thus, answers obtained from an avatar in a virtual world would be answers of an ideal character, reflecting cognitions of such upgraded personality, not necessarily matching with that of the person behind the screen monitor in real situations. Since there might be a difference between the real and the virtual self, one could expect predominance of the player/avatar personality in different circumstances with different

results. Hence, we recommend caution and encourage further trials before claiming the external validity of researches in virtual worlds'.

Bearing in mind the limitations just pointed out, it is mandatory to mention the great potential of virtual worlds as research settings for marketing research. We here find preliminary evidence that researchers using virtual world settings for their research can expect similar pattern of results that they would obtain carrying out the same research in the real world, but with the advantage of increased efficiency and control.

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Appendix A

Online questionnaire[i]

Eco-Car: How do you feel?

The following quick survey aims at understanding your feeling toward ecological products, and specifically to an eco-car.

Please answer to the following question by clicking on YES or NO:

1. Animals should have legal rights.
2. A change in climate caused by increased levels of CO_2 in the atmosphere is called the greenhouse effect.
3. The greenhouse effect does not result in the melting of glaciers in central Europe
4. Mass media show environmental problems in a more pressing and serious way than in reality
5. In the future technological progress will bring solutions to ecological problems
6. The quality of an environmentally friendly product is lower in comparison to its conventional alternative

Please answer to the following statements by clicking on one of the stars, from the lowest (1) – meaning "probably no" to the highest (9), meaning "probably yes", and 5 meaning "undecided":

7. For everything that I do including deeds affecting the environment I am responsible to a supernatural force, for instance God.
8. I support raising parking fees in cities
9. I am ready to pay environmental taxes (e.g., raising fuel or automobile taxes)
10. I will stop the engine at the red lights in the future
11. With their behavior consumers can contribute most to the protection of the environment
12. If you were given the chance to purchase a low-emission car, would you trade in your current vehicle?

[i] Items 2 and 3 measure knowledge; items 1, 4, 5 and 6 measure values; items 7 to 11 measure attitudes and item 12 measures behavioral intentions. Age, gender and nationality were asked on a separate page not reported here.