CAST
Campaigns and awareness raising strategies in traffic safety

Work-package 4
Evaluation of a road safety campaign

Evaluation of the isolated effects of a seat-belt campaign in Belgium

K. Brijs
S. Daniels
T. Brijs

Hasselt University – Transportation Research Institute (IMOB)
Belgium

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Summary

A Belgian national safety belt campaign was evaluated by means of a questionnaire survey in a convenience sample of students. The evaluation was done through a three group after-only design with the use of one control group and two experimental groups.
Participants were recruited from university and high school students. The experimental groups consisted of students following courses at one location whereas students at three other locations served as control group.

The first experimental group, the pre-attentive group, was unattentively exposed to a number of campaign billboards in the central hall of the main university building.
The second experimental group, the attentive group, was exposed to the campaign in a very direct and attentive way. While the questionnaires were completed, the billboard campaign image was projected on a screen in front of the lecture room.
The control group consisted of students from two high schools that never need to enter the building where the campaign material was shown.

A total of 575 questionnaires were suitable for analysis, of which 197 in the pre-attentive group, 168 in the attentive group and 210 in the control group.

The questionnaire was designed according to the framework of the Theory of Planned Behaviour . The different questions were related to the different TPB-constructs such as behavioural beliefs, normative beliefs, control beliefs, attitudes, subjective norms, perceived behavioural control, intentions and self-reported behaviour. Each TPB-construct was considered to be measurable by of one or more dimensions. Those dimensions were each measured by one or more different item-questions.
Furthermore some background variables were recorded such as age, gender, driving license status, car use frequency, car use role (i.e. if one is usually a driver or a passenger when sitting in a car), past behaviour and habits.

In a first stage an exploratory factor analysis was run to check whether the assumed structure was present in the data and – if so – to group the relevant factors and questionnaire-items for each TPB-construct in order to describe the different TPB-concepts adequately.
The EFA was done for each of the three groups (attentive – pre-attentive – control) separately, meaning that the resulting relevant factors and items per construct were not necessarily the same for each of the groups.

Subsequently t-tests and ANOVA-analyses were executed in order to compare the mean scores on each construct between the different groups, i.e. to reveal some possible differences between the three groups on certain items. No significant differences between the pre-attentive group and the control group were found. Some variables appeared to differ significantly between the attentive group and the control group: perceived behavioural control (automatism), perceived behavioural control (motivation), habit, past behaviour, behavioural intention and scenario-related behaviour.

Furthermore linear regression models were fitted by considering each time a different TPB-construct as the dependent variable and the others as independent variables. This was done for the three groups separately and subsequently for the dataset as a whole, i.e. the three groups together. By doing this, the relationships between the different TPB-constructs could be established. The results support the basic assumptions underlying the TPB-framework. That is, behaviour is formed by means of a multi-stage process with distal factors (i.e., behavioural, normative and control beliefs) exerting an effect on behaviour which is mediated to a large extent by more proximal determinants such as attitudes, subjective norm, perceived behavioural control and behavioural intentions.

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Introduction

The WP 4 of the CAST-project targeted to apply a suitable method for evaluating the outcome effects of road safety campaigns in Europe. The original aim was to test the developed evaluation method on a (pan-European) campaign. However, since no suitable pan-European campaign was available, it has been decided to evaluate different country-specific campaigns.

The present report describes the results of the evaluation of a campaign on seat belt use in Belgium. The campaign was originally developed by the Belgian Road Safety Institute (BIVV/IBSR). The original campaign ran in 2004 on a national level in Belgium and consisted of a mix of campaign materials such as TV-spots, leaflets and billboards alongside motorways and highways.

For the purpose of the evaluation a sample of university and high school students was exposed in 2008 to the campaign posters in an experimental setting whereas a control group of students were surveyed who were not exposed. The evaluation was done by the Transportation Research Institute (IMOB) at Hasselt University (Belgium).

The present evaluation report is structured according to the guidelines developed in the CAST-workpackage 2, more specifically the reporting tool (CAST-deliverable 2.4). In a first chapter the evaluated campaign is described. Subsequently the different components of the applied evaluation method are explained: the experimental design, the survey questionnaire, used statistical methods, sample size and some sample characteristics . Finally the results are provided, some conclusions are drawn and some elements are discussed.
The report is completed by a bibliography.

1. Description of the evaluated campaign

1.1 Background information

Although several seat belt campaigns were held previously, observations in the year 2003 revealed that on average still only 6 out of 10 Belgian drivers and front passengers wore their seat belt. Moreover, survey data indicated that less than 50% of the rear seat passengers were regularly wearing their seat belt (BIVV, 2004). Particularly in comparison with some other countries like Canada and Sweden these percentages appeared to be very low and thus insufficient.

Nonetheless, seat belts generate important safety benefits and are believed to have, after their introduction 50 years ago, contributed considerably to the mitigation of the consequences from road accidents. Moreover they are considered to be a cheap and consequently a cost-efficient means to reduce the severity of traffic injuries (BIVV, 2004).

Therefore the Belgian Road Safety Institute decided to launch another campaign on seat belt use.

As stated by the Belgian 'States General on traffic safety' (FCVV, 2002) the concrete target was to increase the seat-belt wearing rate by 2005 to 67% in the front seats and 55% on the rear seats. By 2009 the target was to reach 87% on front and 75% on rear seats.
Succeeding in this target would reduce the number of traffic victims with an estimated number of 187 killed, 1062 seriously injured and 7463 slightly injured in 2009 compared to 2001 (which was the last year of which accident data were available in 2004) (BIVV, 2004).

Compulsory seat belt wearing has been part of the highway code for many years. Wearing seat belts is in Belgium mandatory for car drivers and front passengers since June 1975. From 1991 onwards the seat belt has become compulsory also on the rear seats. In 2000 the compulsory seat belt wearing was extended to all motor vehicles (such as lorries and busses) on any seat that is equipped with seat belts (BIVV, 2004).

Despite their legal duty and their present knowledge of the life-saving abilities of seat belts, it was stated that many people still don't wear seat belts while driving a car or sitting in a car, mainly on roads with lower speeds and in urban areas (BIVV, 2004).

A survey about a previously held campaign revealed some reasons why people declare to not (always) using their seat-belt. The results are provided in table : 1. The three most important reasons were forgetfulness ("I don't think about it"), discomfort ("restricts freedom to move") and negligence (BIVV, 2004).

Table 1: Why don't you wear the seat belt?

	% of drivers	% of front passengers	% of back passengers
Do not think about it	35	41	39
Discomfort, lack of freedom to move	37	28	24
Negligence	22	23	18
Not convinced of the usefulness	11	10	12
Not necessary if one drives carefully	5	5	5
Too much in a hurry	9	6	2
Risk to get locked in case of accident	7	6	5
I don't drive too fast	4	3	2
Due to health reasons	3	1	0
Not necessary in the back of a car	/	/	24

Source: BIVV, 2004

1.2 Stakeholders

The campaign was elaborated by the Belgian Road Safety Institute (BIVV/IBSR) and was partly sponsored by a private insurance company. The concept of campaigns is usually developed by BIVV/IBSR whereas the development of the campaign message and the campaign materials is generally outsourced to private advertising companies.
No other stakeholders are involved. This is at least partially due to the fact that in the case of a campaign on seat belt use, no particular groups of road users are affected. This happens to be different for other campaigns that affect in particular one group of road users such as campaigns regarding motorcyclists or bicyclists.

1.3 Theme and slogan

The central slogan of the campaign was: "The safety belt. One second changes everything" (Dutch: "De gordel, 't is zo gebeurd", French: "La ceinture, une seconde qui change tout"). The message is twofold: on the one hand it refers to the ease of wearing a seat belt. Fasting the seat belt is very convenient, is quickly done and should happen routinely: it takes only one second. On the other hand it refers, supported by the picture of the broken windshield, to the unexpected and sudden nature of an accident.

Figure 1: central campaign slogan in Dutch and French

Source: www.bivv.be, www.ibsr.be

1.4 Target group

The target group of the campaign consisted of vehicle drivers and occupants. The target group was directly approached, meaning that the target audience was directly addressed and not indirectly, for example via some "significant others" such as parents, partners or peers.
Since the image of the broken windshield was used, it can be assumed that mainly drivers and front seat passengers were considered as the target group. The depicted person is a young male, highlighting the elevated risk level within this age and gender group. Although the campaign material contains those specific elements, the campaign was generally intended to reach the whole population of vehicle drivers and passengers as a non-specific target group (BIVV, 2004).

1.5 Scope of the campaign

The scope of the campaign was national. It was applied in the whole country and intended to reach the whole relevant population, i.e. all vehicle drivers and passengers.

1.6 Timing and duration of the campaign

The original campaign ran during the period 02/06/2004-28/06/2004 and 27/07/2004 - 23/08/2004. The campaign was part of a longer term strategy to increase the use of seat belts and other protective devices.
National campaigns on seat belt use were held almost on a yearly base during the past decade. Table 2 provides a list of national campaigns on the topic of seat belts in Belgium during the period 1998-2007.

Table 2: National seat belt campaigns in Belgium – period 1998-2007

Period	Campaign message
01/01/1998 - 31/12/1998	”And your seat belt?”
07/06/1999 - 11/07/1999	”You never forget your first windshield”
12/07/1999 - 15/08/1999	”Did everybody make the click?”
21/02/2000 - 26/03/2000	”The seat belt. A natural reflex”
12/03/2001 - 08/04/2001	”Attach them. Always”
23/09/2002 - 27/10/2002	”Short distance. Mind the seat belt”
26/05/2003 - 18/09/2003	”Short distance. Mind the seat belt”
02/06/2004 - 23/08/2004	“The safety belt. One second changes everything”
14/02/2005 - 10/04/2005	“Armadillo”
01/08/2005 - 25/09/2005	”I have a friend for life”
24/09/2007 - 24/10/2007	Mum/dad, buckle up or I tell mum/dad

Source: BIVV/IBSR www.bivv.be, www.ibsr.be

1.7 Objectives of the campaign

The main objective of the campaign was to increase seat belt use in person cars, both in the front and in the back side, on all trips (BIVV, 2004). Thus, an increased seat belt use can be considered as the explicitly intended behavioural change.
A second well defined objective was defined as a longer term purpose. It concerned the promotion of seat belt use as a habit, a reflex, something that one does automatically when sitting in a car” (BIVV, 2004).
No other objectives were defined in particular, but some other objectives are likely to have been present in a more implicit way. For example, the picture of the broken windshield seemed to aim to influence the attitude towards the desired behaviour, since it stressed the possible outcomes of the undesired behaviour. Objectives such as improving knowledge or influencing social norms did not seem to be present.
No specific theoretical model was used to set up the campaign.

The target population were all car occupants. No further specifications were defined, e.g. based on gender, age, seating position etc. However, since the campaign image was that of a young man, it can be seen as a implicit way to reach particularly one subgroup, most likely the group of young male drivers who are known to be a specific risk group.

The expected level of effect of the campaign itself was not numerically defined but in a broader sense the numerical targets were adopted that, according to the States General of road safety in 2002 should be reached by 2005 and 2009. The numerical targets consist of an increase in seat belt wearing to 67% in 2005 and 87% in 2009 (front seats) and an increase to 55% in 2005 and 75% in 2009 (back seats) (BIVV, 2004).

1.8 Media plan

The original campaign made use of a set of different media, such as a television spot, posters, a website, leaflets, brochures and car stickers. For the evaluation only the posters were used.

Tv-spot

The TV spot starts in a cumbersome, abstract atmosphere, reinforced by the background music. The focus moves to an object that appears gradually on the foreground: a needle that is pricking through a surface that resembles to a human body. Subsequently one sees the needle moving under the skin and a thread that is affixing two surfaces. Thus, the needle is used to stitch someone's skin. The music becomes more and more oppressive and suddenly the screen turns black. Then an eye appears, the camera zooms out and one sees a face behind a broken windshield. Through a hole in the windshield an eye is clearly visible. At the end of the spot a slogan appears: "The safety belt. One second changes everything".
The spot was broadcasted in Dutch on TV1, VTM en VT4 (public and private channels serving the Flemish community), in French on la Une, la Deux, RTL/TVi, Club RTL and Plug TV (public and private channels serving the French community) and in German on BRF (public channel serving the German community).

Posters

The poster used the last image of the TV spot, with the campaign slogan. It suggests that the person behind the windshield has had a car accident and that the fragments of glass are hiding severe injuries. The possible horrifying consequences are not explicitly shown but only suggested. The posters are used on large billboards alongside motorways and similar roads.

20 000 prints of a smaller version of the posters were distributed through the mailing list of the Belgian Road Safety Institute.. That allowed to reach a general audience at crowded, often public places such as police offices, youth clubs, libraries and companies

Flyer and brochure

An existing flyer on seat belt and child restraint legislation was adapted and renamed to "The safety belt. One second changes everything" . The flyer contained a series of tips concerning a correct seating position in front of the steering wheel and provided the current legislation, particularly about carrying young children in a car.
Besides the flyer a brochure, titled: "Buckling up children in a car", was available about carrying children in a car. This brochure provided in particular information on restraint systems for children in cars and the applicable legislation.

Sticker

On the occasion of preventive controls on seat belt use, the police forces distributed small stickers representing a safety belt. More than 30 000 stickers were produced. They could be affixed easily inside a car in order to remind occupants to wearing the seat belt.

Internet
The website of the Belgian Road Safety Institute (BIVV/IBSR) was mainly used to make the above-mentioned documents and materials digitally available. The digital platform of the BIVV/IBSR was used to send a newsletter to all the participants of the "Road Safety Quest", a contest on road safety that was held in the same period.

Television programs
4 television programs (two Dutch-speaking and two French-speaking), fully dedicated to road safety, paid special attention to the topic of seat belt use at the moment of the campaign: Kijk Uit (VRT), Veilig Thuis (VTM), Contacts (RTBF) en Ça Roule (RTL/TVi).

1.9 Integrated campaign - accompanying activities

The original campaign was an integrated campaign in which the communication strategy was mixed with an enforcement strategy. The combination of enforcement with mass media campaigns was done according to a recommendation of the European Commission to organise at least two times per year during a period of at least two weeks, intensive checks on seat belt use in combination with public awareness raising, on those locations and moments where the accidents risk was the highest (BIVV, 2004).
The public perception of the risk to get fined for not wearing seat belts was too low since it was considered as "low" to "very low" by 56.2% of the respondents in a survey in 2003 (Silverans et al., 2005). Therefore the police services were requested to raise their enforcement activities regarding the non-use of seat belts during the period of the campaign. However, no specific information is available on the nature or the intensity of the enforcement that was put in place in reality.

2. Evaluation method

2.1 Introduction

Results of meta-analyses (e.g., Delhomme et al. 1999; Delaney et al. 2004; Rutten & Van den Bulck, 2007) clearly suggest that traffic safety campaigns which are grounded into theory are substantially more effective in reaching their goals compared to campaigns where no such theoretical background supports the intervention.

Theory-based stimuli of very different kinds have been implemented throughout the years, with concepts and ideas being drawn from various theories focussing on the explanation (and change) of road safety-related behaviour (Lapinski & Witte 1998). Among the most popular theories we find for instance, the Theory of Planned Behaviour (Ajzen and Fishbein 2005), The Health Belief Model (Becker 1974; Rosenstock 1974), Protection Motivation Theory (Rogers 1975, 1983), Social Learning Theory (Bandura 1977) and the Extended Parallel Process Model (Witte 1992, 1998).

The present study evaluates the effectiveness of a Belgian seat belt campaign in light of the basic assumptions underlying the Theory of Planned Behaviour (TPB). One of the reasons that motivated us to focus on the TPB in particular, was an empirical study recently published by Simsekoglu & Lajunen (2008) in which a TPB-based model for the explanation of seat belt use showed better goodness-of-fit compared to other models such as the Health Belief Model.

The main purpose of the current study was twofold. First of all, we wanted to test whether being exposed to a seat belt campaign would affect (or not) those variables that are identified by the TPB as key determinants of behaviour. Next to that, we wanted to verify whether the basic assumptions underlying the TPB could be supported (or not).

2.2 Evaluation design

3.2.1. DESIGN

After discussion with the Belgian Road Safety Institute (BIVV/IBSR) it was decided to evaluate a previously implemented safety belt campaign. More specifically, the campaign ran in 2004. The evaluation was carried out by means of **a three group after-only design** with the use of one control group and two experimental groups. Data was gathered by means of **a convenience 'student' sample**. More specifically, participants were recruited from university and high school students at Hasselt University and its association partners. The experimental groups consisted of students following courses at one location whereas students at three other locations were used and selected as control group. Since the assignment of subjects to the different groups in the experiment was not fully randomized, the current design is to be qualified as **a quasi-experimental design**.

All data were collected by means of **self-report measures**. That is, subjects completed classical **self-administered paper-pencil survey questionnaires**. For each response session, lecturers were asked to offer 30 minutes time within their course in order to enable students to complete a questionnaire. Answering instructions made respondents explicitly aware of the fact that this was a questionnaire, probing for **personal opinions instead of in/correct answers**.

3.2.2. VALIDITY

Different aspects of the study design determine to which extent results can be considered as internally as well as externally valid. We briefly focus on three such aspects, i.e., **sample type**, **randomisation of subject assignment**, and **measurement set-up**.

The use of student samples has its pros and cons, speaking in terms of internal and external validity (Enis et al. 1972). Although in general, people are rather sceptical about the use of student samples for scientific purposes, there are three arguments that uphold our decision to opt for a student sample.

First of all, as for external validity, critics typically point out that student samples often do not allow researchers to generalize results to the overall population. Nevertheless, in our case, there is something to say in favour of selecting students as 'model type' respondents, because the campaign under study was tailored more precisely at young adolescents

Secondly, the use of student samples becomes less problematic in cases where focus is on internal rather than external validity. Since our second objective is to test the assumptions underlying the TPB for this specific sample (and not to see whether TPB can be generalized to other populations!), this study can be considered as one where focus is primarily on internal validity. Studies aimed at exploring and testing the validity of theories traditionally do so within settings that are controlled for disturbances as much as possible. Potential biasing effects might, among other factors, be caused by the heterogeneous composition of the sample used. Even though such sample-specific biases can never be completely ruled out, one way to proceed is to select a student sample. Indeed, as Enis et al. (1972) argue themselves, student samples are typically known for their more homogeneous composition.

Thirdly, meta-analyses stemming from various disciplines and research areas have already shown that effect sizes do not always differ significantly between student and non-student samples (e.g., Liefeld 1993; Verlegh and Steenkamp 1999).

Like the sample type, randomisation of subject assignment and measurement set-up mainly affect causal induction, i.e., the degree to which one can ascribe the observed effects to the manipulated conditions. Ideally, one should compare randomly assigned treatment group(s) with a control group with, for each group, a pre- and a post-measurement. Pre-and post-measurement in the treatment group allow the researcher to establish whether the imposed intervention has generated an effect (i.e., whether the values for certain output variables have changed or not). Besides that, comparison with a control group is needed in order to 'guarantee' that the observed effect can be attributed (only) to the intervention, and not to other potentially intervening variables.

Strictly taken, in a setting like ours (with no random assignment and no pre-test), finding a difference on the output variables between the treatment and the control groups might still be caused by other factors than the intervention itself. First of all, the observed effect might be due to systematic differences in the group samples (such systematic differences between samples indeed might still exist because subjects have not been assigned to their groups in a fully randomized manner!). Secondly, the absence of a pre-test makes there is nothing the scores on the output variables for the treatment group can be compared with. The lack of such a within-group point of comparison makes that we cannot determine whether the intervention has changed scores on the output variables for the treatment group. These two elements taken together explain why the results of our study should be interpreted with care.

3.2.3. GROUP DESCRIPTION

The first experimental group was exposed to a number of campaign billboards in the central hall of the main university building. This central hall is an obligatory passing point whenever students go to the lecture rooms. This group was expected to be largely unaware of the non-attended information. This situation can be expected to be reasonably comparable to the real-traffic situation in which road users are confronted with billboards alongside highways. This group is further called the **pre-attentive group** (see Yoo 2005 for a detailed discussion of the 'pre-attentive' concept). The entire pre-attentive group filled out the questionnaire on the same day as the stimulus exposure.

The second experimental group was exposed to the campaign in a very direct and attentive way. While the questionnaires were completed, the campaign billboard was projected on a screen in front of the lecture room. In the introductory briefing and in the questionnaire students were explicitly asked to look at the projected campaign material. This group is further called the **attentive group**.

The **control group** consisted of students from two associated high schools that never need to enter the building where the campaign material was shown. They were therefore not exposed to the campaign stimulus and they could not 'interfere' with the two treatment groups.

3.2.4. PROCEDURE

Students throughout the three different groups completed the same questionnaire, except for the students in the attentive group, who received a number of additional questions regarding the campaign itself. For the attentive group two different versions of the questionnaire were composed, being different only with respect to the order of the questions. One version probed for stimulus-related variables first and for seat-belt related variables next while the other version did so vice-versa. The underlying motivation was to verify whether order of questions causes any response bias.

Filling out the questionnaires always took place within regular classroom settings. Total time of administration took no longer than 15 minutes. Respondents were informed that their data would be

dealt with anonymously. A total of 575 questionnaires were suitable for further analysis, of which 197 in the pre-attentive group, 168 in the attentive group and 210 in the control group.

3.2.5. QUESTIONNAIRE

The final version of the questionnaire was first pre-tested on a group of 26 model respondents in order to find out whether instructions as well as questions were clear and whether wording had to be changed or not. As previously mentioned, two different questionnaires were developed, one with stimulus-related questions for the attentive group and one without such questions for the control group. Below, we present a more detailed overview of the structure the most extended version of the questionnaire (i.e., the attentive-group questionnaire).

The attentive group questionnaire consisted of three sections. Section 1 asked for respondent –related background information. Section 2 (only for attentive group!) contained questions related to the campaign stimulus itself. Section 3 focused on the campaign theme (i.e., seat belts) and measured the different variables appearing within the TPB + some additional variables (i.e., habit and past behaviour), shown to be relevant as determinants of behaviour (e.g., Ajzen 2002; Rhodes & Courneya 2003; Davies 2008).

Section 1: Background information

This section contained 14 questions: (1) sex, (2) age, (3) education of father, (4) education of mother, (5) driver status, (6) car use, (7) car use frequency, (8) chance of getting fined for not wearing seat belt, (9) past control for wearing seat belt, (10) past fines for not wearing seat belt, (11) familiarity with the campaign stimulus shown, (12) recognition of campaign stimulus shown, (13) last time respondent was confronted with the stimulus (14) type of medium the stimulus was supported by.

Section 2: Stimulus-related questions

This section probed for three specific concepts related to the campaign stimulus: (1) overall attitude toward the stimulus, (2) cognitions related to the stimulus and (3) emotions related to the stimulus.

Overall attitude toward the stimulus was measured by four items (good/bad, appealing/unappealing, positive/negative and likeable/dislikeable) put on a 7-point semantic differential (-3/+3). This is in line with the approach proposed by Holbrook and Batra (1987) and Shiv et al. (1997).

Cognitions related to the stimulus was operationalized as a four-dimensional construct with each dimension being captured by four items, all measured by means of 5-point Likert scales (1 = totally disagree, 5 = totally agree) . This was in line with the approach followed by Burke & Edell (1989). Dimension 1 was labelled *informativeness* and measured by the following items: stimulus is informative, has a clear message, is easy to understand, is simple. Dimension 2 was called *interestingness* and consisted of four items: stimulus makes me curious, is boring (reverse coded!) is interesting, keeps my attention. Dimension 3 *relevance* contained the following items: stimulus is important, relevant, helpful, useful. Dimension 4 *execution and style* was measured by the items beautiful, original, stylish and eye-catching.

Emotions related to the stimulus was operationalized as a two-dimensional construct with each dimension being captured by four items, all measured by means of 5-point Likert scales (1 = not at all, 5 = very strongly) . This was again in line with the approach followed by Burke & Edell (1989). Dimension 1 *fear* contained four items: the stimulus makes me feel anxious, worried, fearful, threatened. Dimension 2 *joy* was captured by the following four items: the stimulus makes me feel enjoyed, optimistic, happy, enthusiastic.

Section 3: TPB-questions related to seat belt

This part of the questionnaire queried for a series of TPB-variables related to the theme of the campaign, i.e., seat belts. The operationalization procedure was in narrow accordance with instructions provided by the manual entitled *Constructing questionnaires based on the theory of planned behaviour: A manual for health services researchers* (e.g., Francis et al. 2004).

Special care was taken of the so-called 'correspondence principle', i.e., the fact that all constructs appearing in the TPB are measured at the same level in terms of target, action, context and time (Ajzen & Fishbein 2005). This is mainly done in order to avoid evaluative inconsistencies. More in detail, respondents were offered a visual stimulus, i.e., a photo of a specific road scene (see Figure 2) and instructed about the fact that, all the TPB-related questions had to be answered with this particular road situation in mind. Next to that, scale endpoints were mixed throughout the questionnaire in order to prevent the risk for response sets (i.e., the tendency to answer questions in the same way, regardless of their content) to occur (Francis et al. 2004). However, in order to avoid this to be counterproductive in that it might confuse subjects or simply slip their attention, we made them aware of this before filling out the questionnaire.

Figure 2: visual stimulus evoking specific road scene

In general, 10 constructs were measured, i.e., behavioural beliefs (BB), normative beliefs (NB), control beliefs (CB), attitude (ATT), subjective norm (SN), perceived behavioural control (PBC), behavioural intentions (BI), habits (HAB), past behaviour (PB) and behaviour (B). Below, we briefly discuss how each of these was operationalized.

Behavioural beliefs (BB): in total, four behavioural or 'outcome' beliefs (i.e., safe feeling, good feeling, lower fine risk, lower injury risk) were measured. For each of these beliefs, we had one item probing for strength and one for evaluation. This is in line with the findings of Elliott et al. (2005). Strength questions were put on 7-point unipolar scales (1 = very unlikely, 7 = very likely) while evaluation questions were on 7-point bipolar scales (-3 = negative, +3 = positive). The scores for both items were multiplied with each other, resulting in a so-called 'single behavioural belief index'. The four resulting belief indexes were then averaged and divided by four (i.e., the total number of behavioural beliefs), leaving us with an 'overall behavioural belief index' that served for further data analysis.

Normative beliefs (NB): in total, four reference groups were selected for the measurement of normative beliefs (i.e., friends, parents, other road users and police). For each of these, we had one item probing for strength and one for 'motivation to comply'. Strength questions were put on 7-point unipolar scales (1 = disagree, 7 = agree). Motivation to comply questions were also on 7-point unipolar scales (1 = totally not, 7 = completely). The scores for both items were multiplied with each other, resulting in a so-called 'single normative belief index'. The four resulting belief indexes were then averaged and divided by four (i.e., the total number of normative beliefs), leaving us with an 'overall normative belief index' that served for further data analysis.

Control beliefs (CB): four reference control beliefs (i.e., when being hasty, when being busy in mind, when meeting other road users, when driving only a short distance) were assessed. For each of these, we had one item probing for 'power' and one for 'frequency'. Power questions were put on 7-point unipolar scales (1 = real probably will not wear seat belt, 7 = real probably will wear seat belt). Frequency were also on 7-point unipolar scales (1 = never, 7 = often). The scores for both items were multiplied with each other, resulting in a so-called 'single control belief index'. The four resulting belief indexes were then averaged and divided by four (i.e., the total number of control beliefs), leaving us with an 'overall control belief index' that served for further data analysis.

Attitude (ATT): was assessed in a direct manner, that is, by means of four 7-point bi-polar (-3, +3) scales (i.e., wearing seat belt is disadvantage/advantage, bad/good, positive/negative, unacceptable/acceptable). Scores for the individual scales were averaged and divided by the total number of items, resulting in an attitude index score that served for further analysis.

Subjective norm (SN): was also captured in the direct manner by means of four 7-point unipolar scales (1= disagree, 7 = agree). Items were worded in terms of how people being important to the subject think (or not), wish (or not), accept (or not) and approve (or not) the subject should be wearing the seat belt. Scores for the individual scales were averaged and divided by the total number of items, resulting in a subjective norm index that served for further analysis.

Perceived behavioural control (PBC): was again measured in a direct manner by means of four 7-point unipolar scales (1= disagree, 7 = agree). Questions were aimed at uncovering whether wearing the seat belt would be easy (or not), would be dependent exclusively on the subject (or not), would be dependent upon the subject's own will (or not), and finally, whether the subject was confident (or not) in that s/he would be wearing a seat belt. Scores for the individual scales were averaged and divided by the total number of items, resulting in a perceived behavioural control index that served for further analysis.

Behavioural intentions (BI): were measured by means of two 7-point unipolar scales (1 = disagree, 7 = agree). Items were formulated in terms of preparedness and probability of wearing seat belt in the future. Scores on both scales were averaged and divided by two, resulting in a behavioural intention index that served for further analysis.

Habits (HAB): were assessed by means of three items on a 7-point unipolar scale (1 = disagree, 7 = agree). The questions asked whether wearing a seat belt was something subjects did spontaneously (or not), automatically (or not) and whether they sometimes forgot to wear the seat belt (or not). The

last item was reverse coded afterwards. Scores on the scales were averaged and divided by three, resulting in a habits index that served for further analysis.

Past behaviour (PB): consisted of six items on a 7-point unipolar scale (1= never, 7 = always) and asked respondents about their wearing a seat belt when driving inside the city centre, outside the city centre, when having bad weather, when having good weather, when driving on a highway, and during daytime driving. Scores on the scales were averaged and divided by six, resulting in a past behaviour index that served for further analysis. Let us remind here also that past behaviour, a variable standing for frequency of performing a certain type of behaviour in the past, is not the same as habits (for a more detailed discussion on this, see for instance Ajzen 2002).

Behaviour (B): was measured by means of a single item on a 7-point unipolar scale (1= never, 7 = always). It was formulated in terms of whether the respondent wears a seat belt in a situation as the one evoked by the photo. As such, the behaviour variable probes for what we will be referring to from now on as 'scenario-specific behaviour' (= Bscenario).

2.3 Data analysis and results

Data were imputed and analyzed by means of SPSS 16.0. Data analysis was done in four steps. First, we prepared the data for analysis. Next some descriptive statistics were calculated. Then, we looked for scale structure and reliability. Finally, we tested for group differences and structural relationships between TPB constructs. Each of these steps will be commented more in detail below.

3.3.1. Data preparation

After imputation, data were first screened and cleaned if necessary. More in detail, we scanned the data files for potential outliers and we spotted missing values. The latter were replaced by mean values (i.e., so-called 'data imputation'). Also skewness and kurtosis were checked for each item in order to find out whether data was normally distributed (or not). Q-plots indicated that there was no normal distribution in the data.

Once data were cleaned, we calculated 'single belief index scores' for each of the behavioural, normative and control beliefs (= 3x4 = 12 in total). As described throughout the previous section, this was done by multiplying 'strength' and 'evaluation' scores for behavioural beliefs, 'strength' and 'motivation to comply' scores for normative beliefs and 'power' and 'frequency' scores for control beliefs. This was a necessary step in order to be able to perform an exploratory factor analysis for the different belief constructs in the questionnaire.

In addition, for the attentive group a non-parametric t-test was done on the mean values of the two subgroups in order to check if the order of the questions would affect the outcome of certain variables. Since this test revealed no significant differences all the questionnaires were merged and subsequently treated as one group.

Before exploratory factor analysis was executed, we first generated some descriptive statistics, containing more information about the profile and the composition of the three group samples.

3.3.2. Descriptive statistics

As for a more detailed insight into the composition of the three group samples, some descriptive statistics were generated in SPSS 16.0. The tables below inform the reader on the following sample-related characteristics and distributions across the three groups: gender, age, driver status, car use, car use frequency, past seat belt control and past fining for not wearing seat belt.

Table 3: Gender across groups

			Sex		
			male	female	Total
treatment	control	Count	115	95	210
		% within treatment	54,8%	45,2%	100,0%
	pre-attentive	Count	105	92	197
		% within treatment	53,3%	46,7%	100,0%
	attentive	Count	91	77	168
		% within treatment	54,2%	45,8%	100,0%
	Total	Count	311	264	575
		% within treatment	54,1%	45,9%	100,0%

Table 4: Age across groups

	N	Min	Max	Mean	SD
Control group	210	18	25	20,21	1,797
Pre-attentive group	197	18	24	18,91	1,196
Attentive group	168	18	24	19,96	1,121

Table 5: Driver status across groups

			driver status		
			driver licence yes	driver licence no	Total
treatment	control	Count	165	45	210
		% within treatment	78,6%	21,4%	100,0%
	pre-attentive	Count	177	20	197
		% within treatment	89,8%	10,2%	100,0%
	attentive	Count	158	10	168
		% within treatment	94,0%	6,0%	100,0%
	Total	Count	500	75	575
		% within treatment	87,0%	13,0%	100,0%

Table 6: Car use across groups

			car use			
			driver	passenger front seat	passenger back seat	Total
treatment	control	Count	114	85	11	210
		% within treatment	54,3%	40,5%	5,2%	100,0%
	pre-attentive	Count	113	74	10	197
		% within treatment	57,4%	37,6%	5,1%	100,0%
	attentive	Count	110	53	5	168
		% within treatment	65,5%	31,5%	3,0%	100,0%
	Total	Count	337	212	26	575
		% within treatment	58,6%	36,9%	4,5%	100,0%

Table 7: Car use frequency across groups

			use frequency				
			daily	regularly	sometimes	never	Total
treatment	control	Count	94	71	45	0	210
		% within treatment	44,8%	33,8%	21,4%	,0%	100,0%
	pre-attentive	Count	98	83	15	1	197
		% within treatment	49,7%	42,1%	7,6%	,5%	100,0%
	attentive	Count	83	65	20	0	168
		% within treatment	49,4%	38,7%	11,9%	,0%	100,0%
	Total	Count	275	219	80	1	575
		% within treatment	47,8%	38,1%	13,9%	,2%	100,0%

Table 8: Seat belt control over past 3 years across groups

			control past 3 years			
			control yes	control no	don't know	Total
treatment	control	Count	36	165	9	210
		% within treatment	17,1%	78,6%	4,3%	100,0%
	pre-attentive	Count	28	164	5	197
		% within treatment	14,2%	83,2%	2,5%	100,0%
	attentive	Count	20	147	1	168
		% within treatment	11,9%	87,5%	,6%	100,0%
	Total	Count	84	476	15	575
		% within treatment	14,6%	82,8%	2,6%	100,0%

Table 9: Seat belt fining over past 3 years across groups

			fining past 3 years		
			yes	no	Total
treatment	control	Count	12	198	210
		% within treatment	5,7%	94,3%	100,0%
	pre-attentive	Count	3	194	197
		% within treatment	1,5%	98,5%	100,0%
	attentive	Count	0	168	168
		% within treatment	,0%	100,0%	100,0%
	Total	Count	15	560	575
		% within treatment	2,6%	97,4%	100,0%

3.3.3. Exploratory factor analysis

During the next stage of the data analysis procedure, exploratory principal component factor analysis with varimax rotation was applied to the data in order to find out what the more precise factor structure behind the measurement scales was like. In addition to that, for each construct, scale reliability was verified by means of Cronbach's alpha. Throughout the following sections we present the results of these analyses for each of the three groups taken separately.

Notice first of all that, for the variable 'Behaviour' (Bscenario), no factor analysis had to be performed since it was measured by means of one single item only. Next to that, factor analysis for the 12 belief items was performed on the 12 items taken together in order to find out whether indeed, beliefs (overall) split up into the three factors we would expect, i.e., behavioural, normative and control beliefs. Finally,

results are reported only for TPB-related constructs, not for ad-related variables since these have not been used for further analyses

As for the interpretation of the tables below, 'C.R.' stands for a factor's composite reliability and contains the coefficient for Cronbach's alpha, 'V.E.' stands for variance explained in the basic construct and items of which factor loadings are printed in italic were dropped. Several criteria were checked before it was decided that an item could be dropped. More in detail we looked at (cross-)loadings and corrected item-total correlations. Normally, minimal factor loadings should be .50 and cross-loadings should be lower than .30 (De Pelsmacker & Janssens 2007), although sometimes less stringent values are imposed. The traditional cut-off value for corrected item-total correlations is .50 (Green et al. 1988; Tabachnik and Fidell 1989) but for this criterion as well, sometimes less rigid values are accepted.

3.3.3.1. CONTROL GROUP

Table 10: Exploratory factor analysis for control group

Basic construct	Factor structure	Items	Loadings	C.R.	V.E.
Beliefs	Behavioural beliefs (BB)	*Fine risk*	Dropped	.78	34,08%
		Injury risk	.78		
		Safe feeling	.80		
		Good feeling	.81		
	Normative beliefs (NB)	Friends	.72	.63	11,71%
		Parents	.53		
		Other road users	.79		
		Police	.68		
	Control beliefs (CB)	Hasty	.84	.82	17,97%
		Busy in mind	.87		
		Meeting other road users	Dropped		
		Short distance	.77		
Attitude (ATT)	Single factor	Good/bad	.89	.87	71,83%
		Positive/negative	.85		
		Dis/advantage	.89		
		Un/acceptable	.75		
Subjective norm (SN)	Single factor	Thoughts	.63	.68	51,33%
		Wishes	.77		
		Acceptance	.70		
		Approval	.75		
Perceived behavioural control (PBC)	PBC 1 (confidence)	Easy	.91	.81	46,45%
		Confident	.90		
	PBC 2 (motivation)	Own will	.86	.51	29,98%
		Up to me only	.76		
Behavioural intentions (BI)	Single factor	Probability	.92	.82	84,78%
		Preparedness	.92		
Habits (HAB)	Single factor	Spontaneously	.87	.81	72,95%
		Automatically	.88		
		Forget (reverse coded)	.82		
Past behaviour (PB)	Single factor	Bad weather	.93	.96	81,89%
		Good weather	.92		
		Inside centre	.90		
		Outside centre	.93		
		Highway	.83		
		Daytime	.92		

As can be derived from this table, the three expected belief factors were well replicated by the data with behavioural beliefs explaining most of the variance in the basic construct 'beliefs' (34,08%), followed by control beliefs (17,97%) and normative beliefs (11,71%). Also in line with our expectations, all the other constructs were found to be supported by a single factorial structure, except for the variable 'perceived behavioural control'. Here, factor analysis clearly indicated a two-factorial structure with one factor that could be qualified best as standing for the idea of the individual being confident that s/he would perform the target behaviour (i.e., wearing a seat belt). The second factor was more related to the individual's control over the target behaviour being dependent upon one's personal motivation rather than the confidence one has in his/her own ability to perform the target action. The 'confidence' factor clearly explained most of the variance in the basic construct 'perceived behavioural control' (46,45%) than the 'motivation' factor (29,98%).

Although both dimensions are conceptually in very narrow relationship with each other, there is indeed something to say in favour of distinguishing them from each other since they cover two fairly different aspects of so-called perceived behavioural control. Indeed confidence in one's own abilities to perform a certain type of behaviour is not exactly the same thing as the intrinsic motivation to do so.

Kraft et al. (2005) and Manstead & Van Eekelen (1998) also focused on the factor structure underlying the perceived behavioural control variable and they found comparable results. More in detail, they show how perceived behavioural control is in fact multi- rather than single dimensional. More in detail, they propose a three-factorial (i.e., perceived control, perceived confidence and perceived difficulty) or a two-factorial (i.e., perceived difficulty and perceived confidence) structure.

3.3.3.2. PRE-ATTENTIVE GROUP

Table 11: Exploratory factor analysis for pre-attentive group

Basic construct	Factor structure	Items	Loadings	C.R.	V.E.
Beliefs	Behavioural beliefs (BB)	*Fine risk*	Dropped	.63	10,30%
		Injury risk	.78		
		Safe feeling	.59		
		Good feeling	.75		
	Normative beliefs (NB)	Friends	.71	.62	18,49%
		Parents	.61		
		Other road users	.79		
		Police	.59		
	Control beliefs (CB)	Hasty	.79	.74	29,22%
		Busy in mind	.75		
		Meeting other road users	Dropped		
		Short distance	.72		
Attitude (ATT)	Single factor	Good/bad	.90	.87	71,87%
		Positive/negative	.85		
		Dis/advantage	.83		
		Un/acceptable	.82		
Subjective norm (SN)	Single factor	Thoughts	.72	.74	56,59%
		Wishes	.78		
		Acceptance	.77		
		Approval	.74		
Perceived behavioural control (PBC)	PBC 1 (confidence)	Easy	.92	.80	44,85%
		Confident	.90		
	PBC 2 (motivation)	Own will	.87	.64	33,85%
		Up to me only	.84		
Behavioural intentions (BI)	Single factor	Probability	.93	.84	85,88%
		Preparedness	.93		
Habits (HAB)	Single factor	Spontaneously	.88	.85	77,01%
		Automatically	.92		
		Forget (reverse coded)	.83		
Past behaviour (PB)	Single factor	Bad weather	.92	.96	83,91%
		Good weather	.94		
		Inside centre	.93		
		Outside centre	.95		
		Highway	.84		
		Daytime	.91		

Results of factor analysis for the pre-attentive group are very much alike the outcome for the control group. Beliefs split up into the three expected dimensions. However, contrary to findings for the control group, most of the variance in the basic 'beliefs' construct was explained by control beliefs (29,22%), followed by normative beliefs (18,30%) with behavioural beliefs in third range (10,30%). Perceived behavioural control was in this group also supported by a two-factorial structure, with more of the variance in the basic construct being explained by the 'confidence' factor (44,85%) than by the 'motivation' factor (33,85%). All the other constructs were found to be single factorial, which is line with our expectations.

3.3.3.3. ATTENTIVE GROUP

Table 12: Exploratory factor analysis for attentive group

Basic construct	Factor structure	Items	Loadings	C.R.	V.E.
Beliefs	Behavioural beliefs (BB)	*Fine risk*	Dropped	.68	26,87%
		Injury risk	.61		
		Safe feeling	.77		
		Good feeling	.83		
	Normative beliefs (NB)	Friends	.74	.67	19,01%
		Parents	.67		
		Other road users	.79		
		Police	.49		
	Control beliefs (CB)	Hasty	.88	.69	13,94%
		Busy in mind	.85		
		Meeting other road users	Dropped		
		Short distance	.60		
Attitude (ATT)	Single factor	Good/bad	.82	.80	62,63%
		Positive/negative	.76		
		Dis/advantage	.77		
		Un/acceptable	.81		
Subjective norm (SN)	SN1 (opinion)	Thoughts	.85	.56	39,62%
		Wishes	.81		
	SN2 (judgement)	Acceptance	.80	.50	28,62%
		Approval	.82		
Perceived behavioural control (PBC)	PBC 1 (confidence)	Easy	.84	.58	38,46%
		Confident	.83		
	PBC 2 (motivation)	Own will	.82	.56	31,65%
		Up to me only	.84		
Behavioural intentions (BI)	Single factor	Probability	.86	.63	73,17%
		Preparedness	.86		
Habits (HAB)	Single factor	Spontaneously	.87	.76	67,53%
		Automatically	.89		
		Forget (reverse coded)	.69		
Past behaviour (PB)	Single factor	Bad weather	.87	.94	76,58%
		Good weather	.94		
		Inside centre	.84		
		Outside centre	.84		
		Highway	.79		
		Daytime	.93		

Factor analysis for the attentive group shows a remarkable difference with the results for the two previous groups in that the subjective norm variable also appears to be splitting up in two distinct factors. While the first is labelled ‘opinion’ because it is more related to the idea of a ‘statement’, that is, a conclusion to which one comes after some kind of (cognitive) deliberation of pros and cons the second is called ‘judgement’ since it is more associated with the idea of an ‘evaluation’, that is, the ‘affective’ outcome of an (moral) deliberation process. The ‘opinion’ factor explains somewhat more of the variance in the basic construct (39,62%) than the ‘judgement’ factor (28,62%).

The fact that the ‘subjective norm’ variable within TPB splits up into several sub-dimensions is not a surprising finding in itself. Indeed, the idea that subjective norm should be considered rather as a single- than as a multi-factorial construct, is a point raised at several instances within the literature (see for instance Hagger et al. 2005). However, it remains an open question to know what might have

produced this two-factorial structure in the attentive group while for the control- and the pre-attentive group, a single factorial structure was extracted from the data.

For the other constructs, results were quite in line with those for the two other groups. The three expected belief factors could be identified with the largest part of variation in the basic construct being explained by the behavioural beliefs (26,87%), followed by normative beliefs (19,01%) and control beliefs (13,94%). Perceived behavioural control also split up into two dimensions with the largest portion of variance explained by the 'confidence' factor (38,46%), closely followed by the 'motivation' factor (31,65%). The other constructs were found to be single factorial constructs.

Through the next sections, we proceed with the results for the inferential statistics, that is, examination of differences on TPB-variables between groups and of (causal) relationships between TPB-variables.

3.3.4. Inferential statistics

3.3.4.1. One-way ANOVA

First, we performed a one-way ANOVA-analysis with the type of treatment (i.e., control, pre-attentive and attentive) as the independent variable and the different TPB-constructs as dependent variables. Notice that the results presented below are at the 'factor level' and not at the individual 'item level'. This explains why there is no information on the 'subjective norm variable'. Indeed, as discussed throughout the previous section, the factor structure for this particular construct was not the same for each of the three groups, making ANOVA-analysis at the 'factor level' for this particular construct impossible. Significant F-values are printed in bold.

Table 13: One-way ANOVA at the factor level

	F	p
Behavioural beliefs (BB)	,978	,377
Normative beliefs (NB)	1,230	,293
Control beliefs (CB)	2,297	,101
Attitude (ATT)	1,291	,276
PBC1 (confidence)	**5,038**	**,007**
PBC2 (motivation)	**8,150**	**,000**
Behavioural intentions (BI)	**3,520**	**,030**
Habits (HAB)	**6,661**	**,001**
Past behaviour (PB)	**5,592**	**,004**
Behaviour (Bscenario)	**5,533**	**,004**

As can be derived from this table, the type of treatment or 'grouping variable' indeed makes a significant difference in several of the TPB-related variables. More in detail, these are PBC1 (confidence), PBC2 (motivation), Behavioural intentions (BI), Habits (HAB), Past behaviour (PB) and Behaviour (Bscenario).

3.3.4.2. Independent sample t-tests

Next, we did a non-parametric independent sample t-test in order to compare the mean scores on each concept between the different groups. Table 14 presents results for pre-attentive vs. control group comparison and shows that no significant differences could be established between these two groups. Since no significant differences could be detected, it was decided not to compute Cohen's d. Interestingly however, coefficients for the means indicate that values obtained for the pre-attentive

group were in all but three cases (i.e., normative beliefs, control beliefs and PBC2) higher than those for the control group. This can be seen as a suggestive indication of the fact that the campaign under study does produce a (very limited) effect, albeit that the effect remains statistically insignificant.

Table 14: t-test at the factor level (pre-attentive group vs. control group)

Variables	Groups	M	SD	t(p)	Cohen's d
Behavioural beliefs (BB)	Control Pre-attentive	15,87 16,54	6,36 4,69	1,22 (,227)	-
Normative beliefs (NB)	Control Pre-attentive	28,07 26,65	9,91 8,33	-1,57 (,119)	-
Control beliefs (CB)	Control Pre-attentive	31,18 30,64	11,67 8,88	-,52 (,604)	-
Attitude (ATT)	Control Pre-attentive	2,56 2,64	0,87 0,66	1,06 (,294)	-
Subjective norm (SN)	Control Pre-attentive	5,82 5,94	1,23 1,14	1,00 (,320)	-
PBC1 (confidence)	Control Pre-attentive	6,32 6,42	1,24 1,03	,87 (,388)	-
PBC2 (motivation)	Control Pre-attentive	5,71 5,69	1,55 1,57	-,17 (,865)	-
Behavioural intentions (BI)	Control Pre-attentive	6,50 6,64	1,18 0,89	1,31 (,183)	-
Habits (HAB)	Control Pre-attentive	5,89 6,08	1,59 1,32	1,34 (,194)	-
Past behaviour (PB)	Control Pre-attentive	6,42 6,53	1,18 1,01	,99 (,323)	-
Behaviour (Bscenario)	Control Pre-attentive	6,33 6,48	1,44 1,12	1,15 (,253)	-

Table 15 lists up the results for comparison of means between attentive and pre-attentive groups. As can be seen, for the concept 'subjective norms' no such comparison could be applied, since the underlying factor structure for this concept differed between both groups. Significant differences are printed in bold.

Table 15: t-test at the factor level (attentive group vs. pre-attentive group)

Variables	Groups	M	SD	t(p)	Cohen's d*
Behavioural beliefs (BB)	Pre-attentive attentive	16,54 16,50	4,69 4,87	-,09 (,931)	-
Normative beliefs (NB)	Pre-attentive attentive	26,65 27,09	8,33 9,77	,46 (,647)	-
Control beliefs (CB)	Pre-attentive attentive	30,64 32,80	8,88 8,63	**2,35 (,019)**	**0.25 (SMALL)**
Attitude (ATT)	Pre-attentive attentive	2,64 2,67	0,66 0,63	,54 (,588)	-
Subjective norm (SN)	Pre-attentive attentive	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
PBC1 (confidence)	Pre-attentive attentive	6,42 6,66	1,03 0,76	**2,56 (,011)**	**0.27 (SMALL)**
PBC2 (motivation)	Pre-attentive attentive	5,69 6,24	1,57 1,19	**3,83 (,000)**	**0.41 (SMALL)**
Behavioural intentions (BI)	Pre-attentive attentive	6,64 6,77	0,89 0,70	1,49 (,138)	-
Habits (HAB)	Pre-attentive attentive	6,08 6,40	1,32 1,03	**2,59 (,010)**	**0.27 (SMALL)**
Past behaviour (PB)	Pre-attentive attentive	6,53 6,76	1,01 0,68	**2,62 (,009)**	**0.28 (SMALL)**
Behaviour (Bscenario)	Pre-attentive attentive	6,48 6,73	1,12 0,80	**2,53 (,012)**	**0.27 (SMALL)**

* Cohen's d was calculated as proposed by Rosenthal & Rosnow (1991)

The results show us that significant mean differences could be found between pre-attentive and attentive groups for control beliefs, PBC1 (confidence), PBC2 (motivation), habits, past behaviour and behaviour. However, as indicated by the coefficient for Cohen's d, differences were rather small (for the interpretation of values for Cohen's d, see Cohen 1988). Interestingly, mean values for the attentive group were systematically higher than those for the pre-attentive group. This seems to suggest that the conditions under which a campaign stimulus is being processed (i.e., the subject being fully aware or unaware of the fact that s/he is exposed to a stimulus), influences the size of the effect that stimulus might have on certain target variables. Table 16 contains the results for comparison of means between attentive and control groups. Significant differences are again in bold.

Table 16: t-test at the factor level (attentive group vs. control group)

Variables	Groups	M	SD	t(p)	Cohen's d*
Behavioural beliefs (BB)	control attentive	15,87 16,50	6,36 4,87	1,06 (,290)	-
Normative beliefs (NB)	control attentive	28,07 27,09	9,91 9,77	-,96 (336)	-
Control beliefs (CB)	control attentive	31,18 32,80	11,67 8,63	1,51 (,133)	**-**
Attitude (ATT)	control attentive	2,56 2,67	0,87 0,63	1,47 (,141)	-
Subjective norm (SN)	control attentive	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
PBC1 (confidence)	control attentive	6,32 6,66	1,24 0,76	**3,10 (,002)**	**0.32 (SMALL)**
PBC2 (motivation)	control attentive	5,71 6,24	1,55 1,19	**3,64 (,000)**	**0.38 (SMALL)**
Behavioural intentions (BI)	control attentive	6,50 6,77	1,18 0,70	**2,55 (,011)**	**0.26 (SMALL)**
Habits (HAB)	control attentive	5,89 6,40	1,59 1,04	**3,59 (,000)**	**0.37 (SMALL)**
Past behaviour (PB)	control attentive	6,42 6,76	1,18 0,68	**3,33 (,001)**	**0.34 (SMALL)**
Behaviour (Bscenario)	control attentive	6,33 6,73	1,44 0,80	**3,24 (,001)**	**0.33 (SMALL)**

* Cohen's d was calculated as proposed by Rosenthal & Rosnow (1991)

The outcome for this analysis is comparable to the one obtained for the previous t-test, except for three differences. Firstly, while a small but significant difference could be detected for control beliefs between pre-attentive and attentive groups, no such difference could be retrieved when comparing mean scores on this variable between control and attentive groups. Secondly, while there was no significant difference for the mean value for behavioural intentions between pre-attentive and attentive groups, such a difference could be assessed when comparing control and attentive groups. Finally, although Cohen's d indicates that all the significant mean differences between control and attentive groups were also small, the scores for Cohen's d are on the average larger when the attentive group is compared with the control group than when compared with the pre-attentive group.

In sum, we can state that students being exposed to the campaign stimulus while being aware of this exposure (i.e., attentive group subjects), had significantly higher mean scores on several of the TPB-variables when being compared with members of the pre-attentive and the control group. However, differences were somewhat larger when the attentive group was compared with the control group (which was not exposed to the campaign at all) than when being compared with the pre-attentive group (which was exposed to the campaign while being unaware of it during exposure). Mean scores on TPB-variables for the pre-attentive group were higher than those obtained for the control group, but these differences remained statistically insignificant.

To end with, from a strategic point of view, it is interesting to establish that the campaign examined here impacts more on the so-called 'proxemic' variables (i.e., those variables that usually impact on behaviour directly such as behavioural intentions, habits, past behaviour and perceived behavioural control) than on the 'distant' variables (i.e., those variables that have an indirect impact on behaviour such as behavioural beliefs, normative beliefs, control beliefs, attitudes and subjective norm).

Throughout the following, we will turn our focus on the basic structural relationships underlying the TPB framework. More in detail, for each group, a multiple (stepwise) linear regression analysis will verify whether these structural assumptions can be supported or not. The main purpose behind these

analyses is to find out whether the TPB can be considered as a valuable theoretical framework for the evaluation of mass media campaigns.

3.3.4.3. Regression analyses

For each group, the analyses were carried out following the same procedure. First, we focused on behavioural intentions as the final outcome variable. Next to that, we analysed models with 'Bscenario' as the outcome variable. For both models, regressions were performed in a stepwise manner with for each step, a series of predictors being added to the model. Table 17 gives a schematic and more detailed overview of the procedure followed for each of the three groups in our study. Printed in italic are the predictors added in each step.

Table 17: regression analyses – an overview of the stepwise procedure

MODEL A -> BEHAVIOURAL INTENTIONS as outcome variable		
Step 1:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB)
Step 2:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB) *Attitude (ATT)* *Subjective norm (SN)** *PBC1 (confidence)* *PBC2 (motivation)*
Step 3:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB) Attitude (ATT) Subjective norm (SN)* PBC1 (confidence) PBC2 (motivation) *Habits (HAB)*
Step 4:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB) Attitude (ATT) Subjective norm (SN)* PBC1 (confidence) PBC2 (motivation) Habits (HAB) *Past Behaviour (PB)*
MODEL B -> Bscenario as outcome variable		
Step 1:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB)
Step 2:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB)

		Attitude (ATT) *Subjective norm (SN)** *PBC1 (confidence)* *PBC2 (motivation)*
Step 3:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB) Attitude (ATT) Subjective norm (SN)* PBC1 (confidence) PBC2 (motivation) *Behavioural intentions (BI)*
Step 4:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB) Attitude (ATT) Subjective norm (SN)* PBC1 (confidence) PBC2 (motivation) Behavioural intentions (BI) *Habits (HAB)*
Step 5:	Predictors:	Behavioural beliefs (BB) Normative beliefs (NB) Control beliefs (CB) Attitude (ATT) Subjective norm (SN)* PBC1 (confidence) PBC2 (motivation) Behavioural intentions (BI) Habits (HAB) *Past Behaviour (PB)*

* Notice that 'subjective norm' splits up in two dimensions for the attentive group

RESULTS FOR CONTROL GROUP

First we will present the results obtained for the control group. While Table 18 is focused more on overall model summary, Table 19 (with significant effects printed in bold) provides us with more detailed input on the predictors and how they perform within each of the models being estimated.

Table 18: Model summaries for control group

MODEL A -> BEHAVIOURAL INTENTIONS as outcome variable			
	R2	**Adjusted R2**	**F(p)**
Step 1:	,446	,438	55,297 (,000)
Step 2:	,650	,638	53,575 (,000)
Step 3:	,688	,676	55,513 (,000)
Step 4:	,722	,710	57,769 (,000)
MODEL B -> Bscenario as outcome variable			
	R2	**Adjusted R2**	**F(p)**
Step 1:	,508	,501	70,886 (,000)
Step 2:	,686	,675	63,147 (,000)
Step 3:	,720	,709	64,692 (,000)
Step 4:	,731	,719	60,453 (,000)
Step 5:	,760	,748	63,012 (,000)

Table 19: Coefficients for control group

MODEL A -> BEHAVIOURAL INTENTIONS as outcome variable						
		Unstandardized coefficients		Standardized coefficients	t	p
		B	Std. Error	Beta		
Step 1	**BB**	,052	,011	**,280**	4,68	**,000**
	NB	,022	,006	**,185**	3,39	**,001**
	CB	,042	,006	**,420**	7,28	**,000**
Step 2	BB	-,007	,011	-,037	-,634	,527
	NB	,004	,006	,034	,720	,472
	CB	,012	,006	**,114**	2,09	**,038**
	ATT	,460	,096	**,340**	4,81	**,000**
	SN	-,012	,048	-,013	-,255	,799
	PBC1	,451	,064	**,474**	7,09	**,000**
	PBC2	-,040	,033	-,052	-1,21	,229
Step 3	BB	-,010	,010	-,053	-,969	,334
	NB	,005	,005	,041	,904	,367
	CB	,003	,005	,034	,620	,536
	ATT	,408	,091	**,301**	4,47	**,000**
	SN	-,035	,046	-,037	-,764	,446
	PBC1	,300	,067	**,315**	4,46	**,000**
	PBC2	-,046	,031	-,060	-1,47	,143
	HAB	,249	,050	**,334**	4,98	**,000**
Step 4	BB	-,013	,010	-,071	-1,36	,174
	NB	,004	,005	,034	,791	,430
	CB	,000	,005	-,005	-,089	,930
	ATT	,299	,089	**,221**	3,35	**,001**
	SN	-,019	,044	-,020	-,445	,657
	PBC1	,169	,069	**,178**	2,46	**,015**
	PBC2	-,044	,030	-,058	-1,49	,137
	HAB	,087	,057	,117	1,52	,131
	PB	,467	,095	**,465**	4,93	**,000**

MODEL B -> Bscenario as outcome variable						
		Unstandardized coefficients		Standardized coefficients	t	p
		B	Std. Error	Beta		
Step 1	**BB**	,065	,013	**,287**	5,08	**,000**
	NB	,029	,007	**,199**	3,88	**,000**
	CB	,057	,007	**,458**	8,43	**,000**
Step 2	BB	,000	,012	-,003	-,051	,960
	NB	,008	,007	,053	1,18	,238
	CB	,022	,006	**,181**	3,49	**,001**
	ATT	,391	,111	**,237**	3,54	**,001**
	SN	,112	,056	**,096**	2,00	**,047**
	PBC1	,518	,073	**,446**	7,05	**,000**
	PBC2	-,062	,038	-,066	-1,61	,109
Step 3	BB	,002	,012	,009	,166	,868
	NB	,006	,006	,043	,999	,319
	CB	,018	,006	**,145**	2,93	**,004**
	ATT	,217	,111	**,131**	1,96	**,052**
	SN	,117	,053	**,100**	2,20	**,029**
	PBC1	,347	,078	**,299**	4,64	**,000**
	PBC2	-,046	,036	-,050	-1,28	,203
	BI	,380	,077	**,311**	4,94	**,000**
Step 4	BB	,000	,012	-,003	-,058	,954
	NB	,007	,006	,048	1,15	,250
	CB	,013	,006	**,107**	2,11	**,036**
	ATT	,215	,109	**,130**	1,98	**,049**
	SN	,100	,052	**,086**	1,91	**,058**
	PBC1	,277	,080	**,239**	3,46	**,001**
	PBC2	-,054	,036	-,058	-1,50	,135
	BI	,304	,080	**,249**	3,79	**,000**
	HAB	,171	,060	**,189**	2,85	**,005**
Step 5	BB	-,006	,011	-,026	-,533	,594
	NB	,007	,006	,046	1,15	,250
	CB	,009	,006	,073	1,51	,134
	ATT	,138	,104	,083	1,33	,187
	SN	,114	,050	**,098**	2,30	**,023**
	PBC1	,160	,080	**,138**	2,01	**,046**
	PBC2	-,058	,034	-,062	-1,70	,092
	BI	,175	,080	**,143**	2,17	**,031**
	HAB	,011	,066	,012	,167	,868
	PB	,557	,114	**,455**	4,89	**,000**

The outcome of these analyses illustrates three things. First of all, the r^2--values for the models where scenario-specific behaviour was the outcome variable were higher than the ones obtained for models with behavioural intentions as the final outcome variable. Secondly, the stepwise procedure clearly demonstrates that the explanatory power of 'distal' variables within the TPB (i.e., variables being further away from behaviour) shifts towards 'proximal' variables (i.e., variables assumed to be related more directly with behaviour) if the latter are included into the model. This can be interpreted as a support for the basic causal structure that underlies the TPB-framework, as it was originally designed by its creators. As such, the TPB reveals itself as a potentially very interesting theory for the evaluation of mass media campaigns. Finally, the results of the regression analyses show that, the main determinants of people's self-reported scenario-specific behaviour are past behaviour (PB), behavioural intentions (BI), PBC1 (confidence) and subjective norm (SN) with past behaviour being the most

powerful predictor. As such, our study mainly identifies the same determinants as the ones advanced by prior studies (e.g., Cunill et al. 2004; Simsekoglu & Lajunen 2008).

However, a clear distinction between these studies and ours is that the outcome of our analysis pleads in favour of adding variables such as habits and past behaviour to the basic TPB-framework because they appear to increase the overall predictive power of the TPB-model. This is in line with findings from more fundamental (empirical) research on the TPB (e.g., Fishbein et al. 1997; Sutton 1998; Conner & Armitage 1998; Armitage & Conner 2000; Ajzen 2002; Rhodes & Courneya 2003).

RESULTS FOR PRE-ATTENTIVE GROUP

Table 20: Model summaries for pre-attentive group

MODEL A -> BEHAVIOURAL INTENTIONS as outcome variable			
	r^2	**Adjusted** r^2	**F(p)**
Step 1:	,452	,444	53,098 (,000)
Step 2:	,656	,643	51,463 (,000)
Step 3:	,668	,654	47,273 (,000)
Step 4:	,710	,696	50,907 (,000)
MODEL B -> Bscenario as outcome variable			
	r^2	**Adjusted** r^2	**F(p)**
Step 1:	,351	,341	34,775 (,000)
Step 2:	,574	,559	36,433 (,000)
Step 3:	,613	,597	37,286 (,000)
Step 4:	,644	,627	37,594 (,000)
Step 5:	,656	,637	35,440 (,000)

Table 21: Coefficients for pre-attentive group

MODEL A -> BEHAVIOURAL INTENTIONS as outcome variable						
		Unstandardized coefficients		Standardized coefficients	t	p
		B	Std. Error	Beta		
Step 1	**BB**	,064	,012	**,338**	5,52	**,000**
	NB	,006	,006	,059	1,08	,280
	CB	,043	,006	**,432**	7,14	**,000**
Step 2	**BB**	,020	,010	**,107**	1,95	**,053**
	NB	-,003	,005	-,024	-,532	,595
	CB	,017	,006	**,172**	3,09	**,002**
	ATT	,138	,075	**,103**	1,85	**,066**
	SN	,038	,038	,048	1,00	,318
	PBC1	,477	,052	**,551**	9,19	**,000**
	PBC2	-,021	,025	-,037	-,841	,402
Step 3	BB	,017	,010	,091	1,66	,098
	NB	,000	,005	-,005	-,121	,904
	CB	,013	,006	**,129**	2,24	**,026**
	ATT	,111	,074	,083	1,50	,136
	SN	,032	,037	,041	,864	,389
	PBC1	,389	,061	**,450**	6,37	**,000**

	PBC2	-,024	,024	-,042	-,981	,328
	HAB	,128	,049	**,190**	2,61	**,010**
Step 4	BB	,007	,010	,036	,695	,488
	NB	,000	,005	-,004	-,100	,921
	CB	,011	,005	**,110**	2,05	**,042**
	ATT	,172	,070	**,128**	2,44	**,016**
	SN	,025	,035	,033	,728	,468
	PBC1	,166	,071	**,192**	2,33	**,021**
	PBC2	-,003	,023	-,006	-,137	,891
	HAB	-,054	,058	-,080	-,936	,350
	PB	,490	,094	**,553**	5,22	**,000**
MODEL B -> Bscenario as outcome variable						
		Unstandardized coefficients		Standardized coefficients	t	p
		B	Std. Error	Beta		
Step 1	**BB**	,066	,016	**,277**	4,15	**,000**
	NB	,007	,008	,050	,853	,395
	CB	,050	,008	**,400**	6,08	**,000**
Step 2	BB	,015	,015	,063	1,03	,306
	NB	-,003	,007	-,024	-,471	,638
	CB	,018	,008	**,144**	2,33	**,021**
	ATT	,021	,104	,012	,197	,844
	SN	,004	,053	,004	,069	,945
	PBC1	,679	,072	**,625**	9,37	**,000**
	PBC2	-,013	,035	-,018	-,362	,717
Step 3	BB	,006	,014	,027	,454	,651
	NB	-,002	,006	-,016	-,324	,746
	CB	,011	,008	,087	1,43	,155
	ATT	-,038	,100	-,022	-,376	,707
	SN	-,012	,050	-,013	-,244	,808
	PBC1	,478	,083	**,440**	5,73	**,000**
	PBC2	-,004	,033	-,005	-,113	,910
	BI	,423	,097	**,337**	4,36	**,000**
Step 4	BB	,002	,014	,006	,114	,910
	NB	,002	,006	,013	,283	,777
	CB	,003	,008	,026	,433	,665
	ATT	-,083	,097	-,049	-,850	,397
	SN	-,021	,049	-,021	-,432	,666
	PBC1	,333	,088	**,307**	3,79	**,000**
	PBC2	-,012	,032	-,016	-,364	,716
	BI	,351	,095	**,280**	3,70	**,000**
	HAB	,261	,095	**,309**	4,01	**,000**
Step 5	BB	-,004	,014	-,018	-,312	,755
	NB	,002	,006	,014	,294	,769
	CB	,003	,007	,025	,420	,675
	ATT	-,029	,098	-,017	-,299	,765
	SN	-,023	,048	-,023	-,478	,634
	PBC1	,210	,099	**,193**	2,11	**,036**
	PBC2	,001	,032	,001	,030	,976
	BI	,261	,100	**,208**	2,61	**,010**
	HAB	,144	,079	**,170**	1,81	**,072**
	PB	,348	,138	**,313**	2,52	**,013**

The analysis for the pe-attentive groups shows us how, contrary to the control group, r^2 values were higher for the models with behavioural intentions as outcome variable, compared to those where scenario-specific behaviour was the final target variable. In addition to that, for the pre-group, attitudes and subjective norms were less important as predictors of behavioural intentions and scenario-specific behaviour, compared to the control group.

However, in line with the control group, the stepwise procedure showed how steadily, the explanatory power shifts from distal to proximal variables. Besides that, the most important predictors were again PBC1 (confidence), habits, behavioural intentions and past behaviour.

RESULTS FOR ATTENTIVE GROUP

Table 22: Model summaries for attentive group

MODEL A -> BEHAVIOURAL INTENTIONS as outcome variable			
	r^2	**Adjusted** r^2	**F(p)**
Step 1:	,231	,217	16,402 (,000)
Step 2:	,549	,526	24,202 (,000)
Step 3:	,602	,579	26,570 (,000)
Step 4:	,672	,651	32,127 (,000)
MODEL B -> Bscenario as outcome variable			
	r^2	**Adjusted** r^2	**F(p)**
Step 1:	,251	,237	18,307 (,000)
Step 2:	,528	,505	22,261 (,000)
Step 3:	,620	,599	28,690 (,000)
Step 4:	,748	,732	46,562 (,000)
Step 5:	,859	,849	86,125 (,000)

Table 23: Coefficients for attentive group

MODEL A -> BEHAVIOURAL INTENTIONS as outcome variable						
		Unstandardized coefficients		Standardized coefficients	t	p
		B	Std. Error	Beta		
Step 1	**BB**	,040	,011	**,273**	3,72	**,000**
	NB	-,001	,005	-,015	-,203	,840
	CB	,031	,006	**,374**	5,44	**,000**
Step 2	BB	-,011	,011	-,077	-1,04	,301
	NB	,000	,004	-,003	-,043	,966
	CB	,013	,005	**,161**	2,81	**,006**
	ATT	,353	,086	**,316**	4,12	**,000**
	*SN1**	,051	,039	,075	1,32	,191
	*SN2**	,005	,033	,009	,141	,888
	PBC1	,409	,063	**,443**	6,54	**,000**
	PBC2	,016	,032	,028	,512	,610
Step 3	BB	-,009	,010	-,064	-,923	,358
	NB	,002	,004	,031	,549	,583
	CB	,009	,004	**,112**	2,04	**,043**
	ATT	,297	,082	**,266**	3,64	**,000**
	SN1	,043	,037	,063	1,17	,244
	SN2	,002	,031	,003	,050	,960
	PBC1	,261	,067	**,283**	3,88	**,000**
	PBC2	,032	,030	,055	1,07	,288
	HAB	,212	,046	**,312**	4,59	**,000**
Step 4	BB	-,007	,009	-,051	-,798	,426
	NB	,002	,004	,033	,634	,527
	CB	,005	,004	,065	1,27	,205
	ATT	,181	,077	**,162**	2,35	**,020**
	SN1	,062	,034	**,091**	1,86	**,065**
	SN2	,020	,029	,036	,695	,488
	PBC1	,152	,064	**,165**	2,38	**,019**
	PBC2	,031	,028	,053	1,12	,263
	HAB	-,010	,057	-,015	-,179	,858
	PB	,573	,099	**,549**	5,77	**,000**
MODEL B -> Bscenario as outcome variable						
		Unstandardized coefficients		Standardized coefficients	t	p
		B	Std. Error	Beta		
Step 1	**BB**	,042	,012	,254	**3,50**	**,000**
	NB	-,004	,006	-,054	-,743	,459
	CB	,039	,006	,418	**6,15**	**,000**
Step 2	BB	,002	,012	,013	,173	,863
	NB	-,003	,005	-,042	-,697	,487
	CB	,021	,005	**,225**	3,83	**,000**
	ATT	,263	,099	**,207**	2,65	**,009**
	SN1	-,042	,045	-,054	-,932	,353
	SN2	-,034	,039	-,055	-,879	,381
	PBC1	,514	,073	**,490**	7,07	**,000**
	PBC2	,022	,037	,032	,582	,561
Step	BB	,008	,011	,048	,700	,485

3	NB	-,003	,004	-,041	-,754	,452
	CB	,014	,005	**,152**	2,81	**,006**
	ATT	,082	,094	,065	,869	,386
	SN1	-,068	,041	-,088	-1,67	,097
	SN2	-,036	,035	-,058	-1,05	,297
	PBC1	,304	,074	**,290**	4,13	**,000**
	PBC2	,013	,033	,020	,395	,693
	BI	,513	,083	**,452**	6,19	**,000**
Step 4	BB	,009	,009	,053	,955	,341
	NB	,001	,004	,014	,302	,763
	CB	,010	,004	**,103**	2,31	**,022**
	ATT	,055	,077	,043	,713	,477
	SN1	-,072	,033	**-,093**	-2,17	**,032**
	SN2	-,041	,028	-,066	-1,45	,149
	PBC1	,117	,064	**,112**	1,83	**,069**
	PBC2	,047	,028	,070	1,69	,093
	BI	,293	,072	**,258**	4,06	**,000**
	HAB	,397	,045	**,516**	8,91	**,000**
Step 5	BB	,009	,007	,057	1,35	,179
	NB	,002	,003	,023	,690	,491
	CB	,006	,003	**,064**	1,91	**,058**
	ATT	-,047	,059	-,037	-,795	,428
	SN1	-,030	,025	-,038	-1,17	,245
	SN2	-,012	,021	-,019	-,545	,587
	PBC1	,018	,049	,017	,363	,717
	PBC2	,054	,021	**,080**	2,58	**,011**
	BI	,017	,060	,015	,281	,779
	HAB	,105	,043	**,137**	2,47	**,015**
	PB	,904	,082	**,763**	11,06	**,000**

* Notice that the variable 'subjective norm' splits up into 2 factors for this group

Overall, results for the attentive group are in line with the outcome for the previous two groups. r^2 values for the model with scenario-specific behaviour are higher than those obtained for the models with behavioural intentions as target variable (except for models in step 1 and 2). Next to that, the stepwise procedure again shows how the explanatory power within the TPB-framework shifts gradually from distal to proximal variables. In general, the most important predictor variables for the attentive group are the same as those for the other two groups (i.e., past behaviour, habits and behavioural intentions). There is however, one clear difference, namely, the fact that for the attentive group, the effect emanating from PBC1 was not significant while the effect generated by PBC2 was significant, although very small and therefore almost negligible.

Throughout the following section, the results of this study will be brought together and we will come to some final conclusions.

3. Discussion and conclusions

The aim of this study was twofold. In first instance, we wanted to find out whether a seat belt campaign stimulus would exert a (significant) effect on some variables known to be crucial determinants of behaviour. Secondly, we wished to verify whether the basic assumptions underlying the TPB-framework could be supported (or not).

As for the first objective, results of the one-way ANOVA and for the more detailed t-tests indicated that indeed, being exposed (or not) to the campaign stimulus studied here, generates significant differences for some important determinants of behaviour. However, this study clearly shows that the type of exposure (i.e., under full awareness or under complete unawareness) should be taken into account as well. Interestingly, subjects being exposed to the campaign stimulus while being unaware of this do not differ significantly from subjects under control conditions.

Thus, being exposed to a campaign stimulus as such does not guarantee that the stimulus will cause an effect in the subject. In addition to that, the subject's awareness should be considered as well. Consequently, in striving for a maximum of effectiveness, campaign planners and designers would do best in paying attention more explicitly to the fact that the stimulus *in se* doesn't pass unnoticed. The fact that subjects are unaware of the stimulus exposure can be related to both characteristics of the stimulus itself (the stimulus doesn't trigger attention for instance because the colours or the images used do not stand out sufficiently) as to characteristics of the environment that take people's attention away from the stimulus (the stimulus doesn't trigger attention for instance because the driver is manoeuvring and therefore focuses more narrowly on the road, not on the scene surrounding the road, or attention goes rather to a traffic sign or an exit lane located nearby a safety billboard than to the billboard itself).

Thus, in order to raise this exposure-awareness several stimulus-related aspects could be taken into account. For instance, in case of billboards aside the road, special attention should go to their exact positioning (do they really fall within the visional scope of the driver, are they located at places where there is not too much interference with or hindering from other road and infrastructural elements, etc.) as well as to their style and design characteristics (do the colours attract attention, is the picture shown not too complicated, is the link between text and image easily processible, etc.). In case of TV- or radio-spots, broadcasting should be carefully planned in order to avoid that the message gets lost in the information-clutter surrounding it.

As for the second objective, the results of a series of stepwise regressions overtly support the basic assumptions underlying the TPB-framework. That is, behaviour is formed by means of a multi-stage process with distal factors (i.e., behavioural, normative and control beliefs) exerting an effect on behaviour which is mediated to a large extent by more proximal determinants such as attitudes, subjective norm, perceived behavioural control and behavioural intentions.

Interestingly, our study adds to this finding that it might be advisable to extend the original TPB-framework with some additional variables such as habits and past behaviour. The latter indeed substantially increased the overall predictive value of the TPB-model in each of the three groups tested.

A closer look at the results shows that wearing seat belts (or not) in the specific situational context evoked by the photo at the top of the questionnaire is determined most powerfully by past behaviour, followed habits (not for the control group), behavioural intentions (not for the attentive group), and the extent to which one is confident in his/her own wearing a seat belt, i.e., PBC1 (not for the attentive group). Other, much less important determinants of scenario-specific behaviour that could be identified were subjective norm (not for pre-attentive and attentive group) and control beliefs (not for control and pre-attentive group). On average, behavioural beliefs, normative beliefs and the extent to which one is motivated to wear a seat belt (i.e., PBC2) were not affecting behaviour itself.

In sum, the results of this study seem to suggest that wearing seat belts is clearly not related to the potential consequences associated with wearing the seat belt, nor with what subjects believe people important to them think about wearing seat belts (or not). Therefore, it would be unwise to approach the target sample questioned here with messages informing the respondent about potential risks or benefits of wearing seat belts. Stressing group norms would not be an advisable solution either. Rather, the accent appears to be on control-related aspects, and more in particular on the confidence one has in his/her own wearing a seat belt or not. Besides this self-confidence, the intentions to wear a seat belt, together with habits and past behaviour are of crucial importance in explaining (and predicting) seat belt use.

In light of these findings, we think it would be a fruitful approach, for instance to demonstrate that wearing seat belts is in fact a very simple, effortless and easy action, thereby potentially increasing one's confidence in being able to do so. Another promising avenue might be to make people more aware of the fact that external conditions (such as time pressure, being busy in mind while driving, driving outside the city centre on a quite rural road, being away for only a short distance, etc.) that might make people forget to wear seat belts or make them believe they do not really need to wear a seat belt, should not refrain them from using the seat belt. Put differently, one should always wear a seat belt.

Besides that, since habits and past behaviour are among the most important determinants of behaviour, it might also be a useful approach to try and create a so-called 'behavioural script' that is automatically activated each time one has the intention to drive. Studies focussing on 'planning' and 'behavioural implementation' or 'behavioural willingness' argue that, besides creating such an intention, people should be encouraged and trained in 'planning' future actions. Indeed, empirical research shows that people planning future actions are significantly higher in performing the behaviour compared to people who only form a behavioural intention, without planning the behaviour (e.g., Gibbons et al. 1998; Armitage & Conner 2000).

4. Bibliography

Ajzen, I. (2002). Residual effects of past on later behavior: Habituation and reasoned action perspectives. *Personality and Social Psychology Review, 6 (2),* 107-122.

Ajzen, I., and Fishbein, M. (2005). The influence of attitudes on behavior. In: D. Albarracin, B.T. Johnson, and M.P. Zanna (Eds.), *the handbook of attitudes*. Mahwah, NY: Lawrence Erlbaum Associates.

Armitage, C.J., and Conner, M. (2000). Social cognition models and health behaviour: A structured review. *Psychology and Health, 15,* 173-189.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 91 (2),* 191-215.

Becker, M.H. (1974). Personal Helath Behavior and the Health Belief Model. *Health Education Monographs, 2,* 324-329.

BIVV (2004). Presentation of the campaign "De gordel, 't is zo gebeurd/ La ceinture, une seconde qui change tout", press conference June 2th, Brussels, Belgian road safety institute, accessed Oct 29, 2008, www.bivv.be.

Burke, M.C., and Edell, J.A. (1989). The impact of feelings on Ad-based affect and cognition.. *Journal of Marketing Research*, 26 (February), 69-83.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd edition).* Hillsdale, NY: Lawrence Erlbaum Associates.

Conner, M., and Armitage, C.J. (1998). Extending the theory of planned behavior: A review and avenue for further research. *Journal of Applied Social Psychology, 28,* 1429-1464.

Cunill, M., Gras, M.E., Planes, M., Oliveras, C., and Sullman, M.J.M. (2004). An investigation of factors reducing seat belt use amongst Spanish drivers and passengers on urban roads. *Accident Analysis and Prevention, 36,* 439-445.

Davies, C. (2008). The relationship between the theory of planned behaviour, past exercise behaviour and intention in individuals diagnosed with Type 2 diabetes. *Studies in Learning, Evaluation Innovation and Development, 5 (2),* 25-32.

De Pelsmacker, P., and Janssens, W. (2007). The effect of norms, attitudes and habits on speeding behaviour: Scale development and model building and estimation. *Accident Analysis and Prevention, 39,* 6-15.

Delaney, A., Lough, B., Whelan, M., and Cameron, M. (2004). *A review of mass media campaigns in road safety*. A Monash University Accident Research Centre Report (No. 220).

Delhomme, P., Vaa, T., Meyer, T., Gordon, H., Goldenbeld, C., Järmark, S., Christie, N., and Rehnova, V. (1999). *Evaluated road safety media campaigns: An overview of 265 evaluated media campaigns and some meta-analysis on accidents*. GADGET-project (WP4), contract No. RO-97-SC.2235. Inrets-LPC, France.

Elliott, M.A., Armitage, C.J., and Baughan, C.J. (2005). Exploring the beliefs underpinning drivers' intentions to comply with speed limits. *Transportation Research Part F, 8,* 459-479.

Enis, B.M., Cox K.K., and Stafford J.E. (1972). Students as Subjects in Consumer Behavior Experiments. *Journal of Marketing Research*, Vol. 9 (February), 72-74.

FCVV (2002). Staten-generaal van de Verkeersveiligheid – dossier 7 gordel, kinderzitjes, helm. Brussels, Federale Commissie Verkeersveiligheid, Jan 29, accessed Oct 29, 2008, www.fcvv.be

Fishbein, M., Triandis, H.C., Kanfer, F.H., Becker, M., Middlestadt, S.E., and Eichler, A. (1997). Factors influencing behavior and behavior change. In: A. Baum, T.R. Revenson, and J.E. Singer (Eds.), *Handbook of Health Psychology*. Hillsdale, NY: Larwence Erlbaum Associates.

Francis, J.J., Eccles, M.P., Johnston, M., Walker, A., Grimshaw, J., Foy, R., Kaner, E.F.S., Smith, L., and Bonetti, D. (2004). *Constructing questionnaires based on the theory of planned behaviour: A manual for health services researchers.* Centre For Health Services Research, Univesity of Newcastle.

Gibbons, F.X., Gerrard, M., Blanton, H., and Russell, D.W. (1998). Reasoned action and social reaction: Willingness and intention as independent predictors of health risk. *Journal of Personality and Social Psychology, 74 (5),* 1164-1180.

Green, P.E., Tull D.S., and Albaum G. (1988). *Research for Marketing Decisions.* New Jersey, Englewood Cliffs.

Hagger, M.S., and Chatzisarantis, N.L.D. (2005). First- and higher-order models of attitudes, normative influence, and perceived behavioural control in the theory of planned behaviour. *British Journal of Social Psychology, 44,* 513-535.

Holbrook, M.B., and Batra, R. (1987). Assessing the role of emotions as mediators of consumer responses to advertising. *Journal of Consumer Research*, 14 (December), 404-420.

Kraft, P., Rise, S., Sutton, S., and Roysamb, E. (2005). Perceived difficulty in the theory of planned behaviour: Perceived behavioural control or affective attitude?. *British Journal of Social Psychology, 44,* 479-496.

Lapinski, M.K., and Witte, K. (1998). Health communication campaigns. In: L.D. Jackson & B.K. Duffy (Eds.), *Health communication research: A guide to developments and directions*. Westport Conn.: Greenwood press.

Liefeld, J.P. (1993). Experiments on Country-of-Origin Effects: Review and Meta-Analysis of Effect Size. In: P. Nicolas and L.A. Heslop (Eds.), *Product-Country Images: Importance and Role in International Marketing*. New York: International Business Press.

Manstead, A.S.R., and Van Eekelen, S.A.M. (1998). Distinguishing between perceived behavioral control and self-efficacy in the domain of academic achievement intentions and behaviors. *Journal of Applied Social Psychology, 28 (15),* 1375-1392.

Rhodes, R.E., and Courneya, K.S. (2003). Modelling the theory of planned behaviour and past behaviour. *Psychology, Health and Medicine, 8 (1),* 57-69.

Rogers, R.W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology, 91 (1),* 93-114.

Rogers, R.W. (1983). Cognitive and physiological process in fear appeals and attitude change: A revised theory of protection motivation. In: J. Cacioppo and R.E. Petty (Eds.), *Social Psychophysiology*. NY: Guilford Press.

Rosenstock, I.M. (1974). The health belief model and preventive health behavior. *Health Education Monographs, 2,* 354-386.

Rosenthal, R., and Rosnow, R.L. (1991). *Essentials of behavioral research: Methods and data-analysis (2nd edition).* NY: McGraw Hill.

Rutten, C. and Van den Bulck, J. (2007). *Mobiliteitscommunicatie in Vlaanderen: Sensibilisatie en gedragsbeïnvloeding door mobiliteitscampagnes of andere communicatietechnieken*. Eindrapport in opdracht van de Vlaamse Overheid.

Shiv, B., Edell, J.A., and Payne, J.W. (1997). Factors affecting the impact of negatively and positively framed ad messages. *Journal of Consumer Research*, 24 (December), 285-294.

Silverans, P., Drevet, M., Vanlaar, W. (2005). Attitudemeting verkeersveiligheid 2003-2004, Brussel, Belgisch Instituut voor de Verkeersveiligheid, www.bivv.be

Simsekoglu, Ö., and Lajunen, T. (2008). Social psychology of seat belt use: A comparison of theory of planned behavior and health belief model. *Transportation Research Part F, 11,* 181-191.

Sutton, S. (1998). Predicting and explaining intentions and behavior: How well are we doing?. *Journal of Applied Social Psychology, 28 (15),* 1317-1338.

Tabachnik, B.G., and Fidell L.S. (1989). *Using Multivariate Statistics.* New York, Harper and Row Publishers.

Verlegh, P.W.J. and Steenkamp J.-B.E.M. (1999). A review and meta-analysis of country-of-origin research. *Journal of Economic Psychology*, Vol. 20, No. 5, 521-546.

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication monographs, 59 (4),* 329-349.

Witte, K. (1998). Fear as motivator, fear as inhibitor: Using the extended parallel process model to explain fear appeal successes and failures. In: P.A. Andersen and L.A. Guerrero (Eds.), *Handbook of communication and emotion: Research, theory, applications and contexts.*

Yoo, C.Y. (2005). *Preattentive processing of web advertising.* Unpublished PhD. Dissertation, University of Texas at Austin.