Research article

Improving the effectiveness of road safety campaigns: Current and new practices

CrossMark

Tamara Hoekstra [a], Fred Wegman [a,b,*]

[a] SWOV Institute for Road Safety Research, The Netherlands
[b] Delft University of Technology, The Netherlands

A B S T R A C T

The evaluation of campaigns aimed at improving road safety is still the exception rather than the rule. Because of this, ineffective campaigns and campaign techniques are allowed to continue to be utilised without question, while new methods of behaviour modification are often ignored. Therefore, the necessity and advantages of formally evaluating road safety campaign efforts are discussed. This article also describes the pros and cons of some of the more common campaign strategies and introduces a number of new methods that show a great deal of promise for the purpose of road safety campaigns. In order to infuse the field of road safety campaigning with such new insights into road user behaviour and behavioural modification, one should look beyond the confines of road safety campaign standards and learn from the knowledge gained in other disciplines such as economics and social psychology. These new insights are discussed in terms of their implications for the future of road safety campaigns.

1. Road safety and road safety campaigns

Road traffic today is inherently dangerous. In fact, in contrast to other modes of transport such as railways and air traffic, the road traffic system was not designed with safety as a jumping-off point [1]. Consequently, in road traffic it is us humans who make the difference between hazard and safety, with little keeping us from harm should we make a mistake. Differently put, unlike other modes of transport that have procedures, safeguards or fallbacks to limit both the occurrence and impact of human error, road traffic relies more heavily on its users to keep accidents from occurring. Given that humans are almost inadvertently prone to make mistakes and commit violations, human behaviour is of particular interest for most road safety professionals. That is where road safety campaigns come in. Together with other 'behavioural' measures (e.g., law enforcement, education, training, and even infrastructure to some extent) road safety campaigns are used as a means of influencing the public to behave more safely in traffic. Road safety campaigns can be defined as purposeful attempts to inform, persuade, and motivate a population (or sub-group of a population) to change its attitudes and/or behaviours to improve road safety, using organised communications involving specific media channels within a given time period [2]. It can have many and multiple purposes, such as informing

the public of new or little known traffic rules, increasing problem awareness or convincing people to refrain from hazardous behaviours and adopting safe ones instead.

This article is based on a keynote speech delivered by Fred Wegman at the PRI (Prévention Routière Internationale) World Congress on June 24th 2009. In this speech, Wegman examined issues pertinent to the present and future of road safety campaigns by discussing evaluation practices, common fallacies concerning the nature of human behaviour and new insights into behaviour modification that may be of use for the future of road safety campaigns. In this article, we elaborate on the insights put forth in the speech with the aim of providing inspiration for the future of road safety campaigns. In order to do so, we first discuss the current practices in evaluating road safety campaign evaluations or the lack of such. We will then examine some of the methods of behavioural modification that are already widely implemented in road safety campaigns. Finally, we will delve into the many promising methods of behavioural modification that can be found in fields such as psychology and economics. These methods and insights are discussed in terms of the ways they might be used to positively influence road user behaviour and by extension, road safety itself.

1.1. Are road safety campaigns effective?

Surprisingly, all the more so given the sheer number of road safety campaigns, only a fraction of such campaigns are formally and thoroughly evaluated [3]. Despite this dearth of evaluation results, there are a number of reports on the subject that give some indication as to

---

the potential effects of road safety campaigns. For example, in 2004 the World Health Organisation concluded that road safety campaigns were able to influence behaviour when used in conjunction with legislation and law enforcement. However, the report also states that "… when used in isolation education, information and publicity generally do not deliver tangible and sustained reductions in deaths and serious injuries" [4].

Likewise, a meta-analysis showed that the effects of mass media campaigns alone are small, especially when compared to the effects of campaigns that were combined with other measures [5]. Without enforcement and/or education a mass media campaign has virtually no effect in terms of reducing the number of road accidents, while adding either of both those measures ensures a reduction of over ten percent (see Table 1). Interestingly enough, it is the local, personally directed campaigns that show by far the biggest effect on road accidents. However, it should be noted that the confidence interval for this result is quite large, meaning that there is a large uncertainty about the true value of this parameter. More importantly, however, is that the meta-analysis only contained a few studies on this type of campaign, and as such this result is based on rather few studies [6], which provide another alternative explanation for the fact that local individualised campaigns seem so much more effective than other types of campaigns.

1.2. The business of evaluating road safety campaigns

The above discussion is based on the results of a meta-analysis. For such analyses, the results of multiple evaluation studies are combined, which allows for comparisons between different types of media campaigns alone and media comparisons in conjunction with other measures. For the evaluation of individual road safety campaigns, however, it is often quite difficult to isolate the effects of the campaign component from the effects of the measures the campaign is combined with. That is, it is hard to tell if obtained results are the result of the campaign itself, or whether they are the result of the campaign combined with these other measures, or even whether the same effects might have been reached by using those accompanying measures alone.

One way to deal with some of the difficulties that come with evaluating the implementation of a campaign, is by pretesting (parts of) the method and of the campaign in a controlled environment. Pretesting can take on various forms depending on the specific characteristics of the intended campaign, but in general it refers to a small-scale study where the campaign concept or individual aspects of it are tested experimentally (i.e., comparing the behaviour or behavioural intentions of people who were presented with the campaign to the behaviour of people who have not been presented with the campaign; comparing the behaviour of people who have been presented with different concepts of the same campaign) to determine if the campaign strategy has any hope of influencing people's behaviour. If the chosen method of influencing behaviour proves successful in an experimental setting, this may be taken as an indication that it's worth trying on a larger scale. If the method does not prove to be effective experimentally, the results of the pretest may prove useful in figuring out how to improve the campaign at a point when it is still possible to make such an overhaul.

When it comes to evaluating the results of a road safety campaign that is or has actually been implemented in the field, a good research design can do much to counteract many such difficulties in the evaluation of road safety campaigns.

At the very least, setting up an evaluation study in a way that will generate credible results requires some basic knowledge of the principles involved in such studies. Such knowledge can be gleaned from the reports engendered by the European CAST (Campaigns and Awareness-raising Strategies in Traffic safety) project. This project was aimed at making clear guidelines and tools to encourage the proper design and evaluation of road safety campaigns. In doing so, a number of tools were created that can be helpful in setting up a sound evaluation study, such as a manual [2], an evaluation tool [7] and a reporting tool [8]. For the purpose of this article, it is not our intention to outline the necessary steps in the evaluation process. Indeed, the above publications acquit themselves of that purpose more thoroughly than one article ever could. Our purpose in discussing the evaluation of road safety campaigns is merely to point out the necessity of it.

1.3. The importance of evaluating road safety campaigns

Because reports on the evaluation results of road safety campaigns are few and far between, there is still little insight available into the effectiveness of campaigns in general, let alone which ingredients have proven to be successful, and which have not. This in turn makes it hard to determine if and how the practice and effectiveness of road safety campaigns might be improved, thereby depriving the organisations behind road safety campaigns of the opportunity to learn from their successes and their mistakes and make a bigger difference. Evaluations of road safety campaigns may, for example, shed some light on the more controversial of current practices (such as the use of fear appeals) and help determine if and when these practices are really effective.

Another manner in which the current lack of formal evaluation practices is to be lamented, is that it means that ineffective campaigns and campaign techniques are allowed to continue unchallenged. The continued use of funds for campaigns whose effectiveness is unclear means that available funds are not spent on other, possibly more effective road safety interventions. This may even keep the field from looking to employ other new and less traditional approaches. Hopefully, as evaluations become more common in the field of road safety campaigns, it will also create some headway for newer methods of behavioural modification to come into play in the stead of techniques that have yet to be proven effective.

In furthering our aim to enhance the effectiveness of future road safety campaigns, we will now proceed to discuss some insights into current practices and beliefs within the realm of road safety campaigns, such as different implications of the targeted behaviour type for the campaign method, the notion that media campaigns can be used to reach the whole population and the controversy surrounding the use of fear appeals.

2. Current practices within the realm of road safety campaigns

2.1. Target behaviour: differences between different types of behavioural targets

One of the things that are reflected by the meta-analyses into road safety campaigns over the years, is that the effectiveness of such campaigns vary considerably depending on the type of behaviour that is targeted [5,9]. Campaigns aimed at increasing seat belt use, for example, have been very effective in promoting its usage (see [10], for this and other examples of effective road safety campaigns). To a certain point that is, because as behaviours become more pervasive, it becomes increasingly hard for campaigns to have any further effect on them. More specifically, as the base level of the measure of effect increases, the impact and expected improvement as a result of a mass media campaign is reduced [11]. Thus, the 'baseline' of a behaviour must be taken

Table 1
Effects of road safety campaigns on road accidents [5].

	Best estimate	95% confidence interval
General effect	−9%	(−13; −5)
Mass media alone	+1%	(−9; +12)
Mass media + enforcement	−13%	(−19; −6)
Mass media + enforcement + education	−14%	(−22; −5)
Local individualised campaigns	−39%	(−56; −17)

into account in determining beforehand if a road safety campaign is to be of any use.

However, not only the baseline of the targeted behaviour matters when considering what type of road safety campaign to implement. As was stated before, all aspects of the target behaviour itself should be considered in determining the best approach. That is, what works for a campaign aimed at drink driving may not work for speeding, and vice versa. There are several examples of research illustrating this very phenomenon. The effectiveness of road safety advertising aimed both at fatigue [12] and drink driving [13], for example, was most determined by whether or not suitable alternatives were provided (i.e., having a designated driver, and alternative forms of transportation). However, providing people with alternatives for their behaviour is not effective in influencing all traffic related behaviours. In the case of speeding behaviours, for example, such alternative behaviours are not readily available. That is, it is not really possible to suggest alternative ways to deal with the dangers that speeding presents, other than to just not engage in this particular behaviour [13]. It is worth noting that speeding in general is a notoriously difficult behaviour to influence through campaigning. Not only is it difficult to provide people with viable alternatives for this behaviour, but it also seems that even enforcement does little to sway people in their propensity for speeding. Indeed, many young drivers hold the belief that speeding is socially acceptable and that avoiding detection by law enforcement is a breeze. More importantly, however, is that reportedly not even increases in the chance of getting caught would sway these youngsters from speeding [14]. The lack of effect garnered by enforcement in relation to speeding may be owed in part to the public's conviction that enforcement is in place not because the behaviour is truly dangerous, but because the government sees it as an expedient way to rake in cash [13]. Thus, in contrast to drink driving and fatigue, speeding behaviours are far less receptive to the provision of behavioural alternatives and even enforcement or the publicity thereof. For road safety campaigns in general, this implies that the nature of the behaviour determines whether or not a certain tactic will be effective, something which can be determined by pretesting a campaign. For speeding behaviours in particular, this means that different means should be sought to try and influence this behaviour for the better. Since it has been suggested that the lack of effect garnered by enforcement is due to the belief that speeding is socially acceptable, that detection and the subsequent penalties can be easily avoided and that the imposed fines represent nothing but governmental greed, the first step may be to try and tackle these beliefs.

Not only do the individual characteristics of a publicity campaign have different implications on different types of outcome behaviours, but the combination of publicity with other measures (such as enforcement, education and personal communication) also has differing effects depending on the type of targeted behaviour. In a study on both the individual and combined effects of publicity campaigns and enforcement aimed at drink driving on the one hand and or speeding on the other, it was shown that the combination of publicity campaigns with enforcement did indeed have a different effect depending on the type of target behaviour. With drink driving campaigns both enforcement and publicity campaigns had significant independent effects, but no combined reinforcing effect. The reverse was true for speeding campaigns, where only the combined effect of enforcement and publicity campaigns was significant and not the two measures independently [13]. This last finding may have something to do with the finding mentioned earlier that speeding is not easily dissuaded through enforcement. The fact that in spite of the lack of individual effects of either enforcement or publicity, a combined effect was still obtained, is somewhat more surprising. The author suggests that since the focus of publicity campaign was on the severe consequences of the crashes, this may have counteracted some of the prevalent cynicism concerning the actual motives of the government to enforce the laws on speeding [13].

Taken together, these results suggest a number of things that should be taken into account. First, it is important that the individual characteristics of the targeted behaviour be taken into account, for what works for one type of behaviour may not work for another. Second, it is important to realise that not only does this have implications for the measures you wish to employ individually, but that even the combination of different measures may also interact differently given a different set of targeted behaviours. Furthermore, to determine what possible effects any given approach might have on the behaviour at hand, careful pretesting may be useful in order to determine what particular approach or combination of approaches is in order. And finally, the fact that different road user behaviours seem to react differently to various types and combinations of road safety interventions means that special care should be taken when conducting or interpreting meta-analyses on road safety campaigns. These types of analyses tend to bundle evaluation results using different methods, focusing on different behaviours and groups within various settings. The research discussed in this paragraph clearly illustrates that this may prove problematic in the interpretation of the results.

2.2. Target audience: using mass media campaigns to reach the entire population

Concerning the prospective audience of a publicity campaign, there seems to be an implicit belief that when you need to reach a bigger range of people or perhaps the whole of a population, mass media campaigns are the way to go. The idea seems to be that almost everyone either watches television, listens to the radio or reads the paper or perhaps even does all of these things at some time or other. Therefore, the greater the reach of the media channel you use to put your message out there, the greater number of people who will receive that message. However, research consistently shows that any type of campaign, including mass media types, is more effective when it is focused on specific groups [2]. Furthermore, there is some evidence that people with low education are less likely to be reached with information through mass media campaigns. This is not due to a lack of comprehension of the message; rather, people with a lower level of education seem less prone to even pay attention to the message conveyed by such campaigns [15]. Instead, people with lower degrees of education are far more likely to be reached by personally contacting them than by ads placed in a local newspaper. Personally contacting people with lower degrees of education (by phone, mail or personal visitations) seems to have a greater chance of getting the message across. This supposition is lent even more credence by the results of the meta-analysis mentioned earlier, which also suggested that local, personally directed campaigns were particularly effective in diminishing road accidents [5]. Taken together, these results indicate that campaigns using more personal forms of delivery and communication are indeed worth the time and effort.

2.3. The pros and cons of fear appeals

Judging by the number of road safety campaigns that make use of fear appeals, there is a firm belief in the ability to "scare people straight". The idea is that when fear is aroused, people will become more motivated to accept the message and recommendations presented in a campaign [16]. Implicitly, the way people sometimes react to these types of campaigns (shock, horror, or even tears) is taken as a sign that the message got through to people, with the firm believers in these types of campaigns saying that they know it works "because you can see the kids leave the classroom with tears in their eyes". The belief that this is somehow indicative of the effectiveness of this approach supposedly is that when people are thus affected by the campaign, they are certain to comply with the dispensed advice. However, it is important to remember that the amount of tears shed is not the ultimate goal of these campaigns. The ultimate goal is the effect the campaign has on actual behaviour and, by extension, on the number of road accidents, and on that count the jury is still out. Because the fact is that although fear can motivate people, it can also have the opposite effect. It may in fact

lead people to employ so-called defensive responses. Such responses may take many forms, for example with people discounting the veracity of the claims in the campaign, by them saying that the campaign bears no personal relevance to oneself, or even by avoiding exposure to the campaign altogether [16,17]. Indeed, from a scientific point of view, fear appeals are rather controversial, in the sense that research into this approach shows a mixed bag of results. In some cases, fear appeals seem to generate promising results in terms of perceived severity, susceptibility and message acceptance, while in others the approach seems to engender the aforementioned defensive response [16].

These diverging results may have something to do with perceived self-efficacy on the one hand, and the perceived threat and susceptibility on the other [16]. Perceived self-efficacy refers to the extent to which people think they are able to do something to prevent whatever the fear appeal is portraying. Thus, when self-efficacy is low (i.e., one does not believe there is anything one can do to stop the fearful image from happening), people are more likely to show the defensive reactions to fear appeals which render them ineffective [16,17]. Perceived threat refers to the extent to which people believe themselves to be in any danger of the consequences shown. Even when people are sympathetic to the plight shown by the fear appeal and feel that the recommended precautions are both sensible and doable, the fear-appeal will not have the intended effect if people do not believe that the consequences shown will ever happen to them. Only if people feel that the portrayed consequences are relevant to themselves and feel they are able to take the preventive measures the campaign proposes, does the fear-appeal have a chance to work.

Another possible explanation for the diverging results is that the effect of fear appeals may be dependent on cultural differences. In the Netherlands, for example, there is a long tradition of road safety advertising with an emphasis on humour rather than fear. This in contrast to countries such as Australia, New Zealand, the United States, and Great Britain that often show explicit pictures of crashes, casualties, injuries and blood, and the related emotions of pain, sorrow and grief of traffic victims and relatives [18]. Using such methods in countries where the people are not used to them, may cause a controversy which might detract from the impact of the campaign.

Yet another factor that determines whether or not fear-appeals have the desired effect, is the gender of the group the campaign is aimed at. Women tend to respond more favourably to fear appeals than men, as evidenced by greater recall, more effect on behavioural intentions and more positive attitudes towards the central message (e.g. [19,20]). Young males, especially, seem to have little susceptibility to fear appeals. Lewis, Tay and Watson (2007) [20], for example, posit that fear appeals have less effect on young males, because they tend to discount and avoid them. So too did Tay & Ozanne [39] find that a fear-evoking drink driving campaign resulted in a reduction in fatal crashes in the group of women of all age categories and in older men (35–54 years old), but not in the target group of young men ages 18 to 24. As young males in general have a higher crash rate than others, the implications of the differing effects of gender on the effectiveness of fear appeals seem highly poignant.

The above discussion on the possible pros and cons of fear appeals illustrates that the wielding of this method is fraught with difficulty. For one thing, one must limit the possibility that people will respond defensively to the campaign, meaning that the fear the campaign evokes should not be so overwhelming that people feel they can do nothing to prevent it. One possible way to do this is by supplying the audience with specific actions that can be taken as preventive measures. It is also important that this action is not only something people think they will be able to do, but that they feel is both credible and suitable to be considered a preventive measure. Furthermore, the audience should be made to feel that the problem is relevant to them. Finally, there are the cultural backdrop and the characteristics of the target audience to consider. Other than the age and gender of the prospective audience, this might also mean focusing on consequences that the target

audience will care about. Young people, for example, may be far more impressed by the repercussions of a road accident on their looks or on their social standing than on their general health and longevity.

All in all, the mantra "if you scare them, they will change" is not as easy as it might at first glance appear to be. Even when all the pointers above are taken into account, people may react differently to a fear-based campaign than expected. Therefore, careful pretesting is in order, not just in terms of how people experienced the imagery, but rather of what most road safety campaigns are actually trying to accomplish, namely, a change for the better in terms of behaviour or behavioural intentions.

3. New approaches on the horizon

Thus far, the discussion of road safety campaigns has centred around the status quo: what has been done, how effective has it been and what steps can be taken to improve upon some of the current practices both in the method and evaluation of road safety campaign. In the remainder of this article, we turn our eyes to the future, to discuss some promising insights into behaviour and behaviour modification that can be gained from social psychology and economics alike. These insights, though not necessarily new or unheard of in their own right, are promising in the sense that they may prove to be useful when adapted to the field of road safety campaigns. Furthermore, all are centred on the same supposition, namely that we humans are by no means the rational decision makers that we think we are [21,22].

Many road safety campaigns seem to be based on the implicit tenet that if people *knew* better, they would *do* better. Usually, such campaigns seek to rectify the current situation by providing the right amount and quality of information (not to mention the reliability of its sources), expecting that as a result, people will come around to the right way of thinking and doing. Granted, some campaigns also employ elements such as attitude and the social norms that play a role in people's chosen behaviour. Yet even when such elements are implemented in a campaign, the strategy often seems to veer right into presenting people with information on either or both the ramifications of the undesirable behaviour and the profits of the correct behaviour.

Underneath it all, most methods seem to be implemented because it is assumed that the behaviour people exhibit is the result of rational thought and careful deliberation. That is, given a set of options people will choose the option that makes the most sense and will ultimately result in the biggest payoff. Logically, that would mean that telling people that certain behaviours are dangerous, should result in those people choosing to do the sensible thing and stop taking such unnecessary risks. People are rational creatures, after all. Or are they?

Evidence that human decision making is decidedly *not* always the result of rational thought, is bountiful. On the contrary, many of our actions are the result of our habits, feelings, biases, circumstances, and so on and so forth [23,24]. In fact, many behaviours are so much the result of such things that conscious rational thought does not play the significant role that many seem to attribute to it. As such, many behaviours have come to be considered as *automatic*: behaviour that is performed unintentionally and without conscious knowledge and control [25]. One way to overcome this is to break a habit by either timing your message to be delivered at the precise moment when people are prone to reevaluate their habits (e.g., change of job or address, having children, etc.) or by aiming the intervention at stopping bad habits from forming [26,27]. Another way to deal with the fact that many behaviours are in fact automatic, is by simply embracing that fact. That is, rather than ignoring this insight and holding out hope that people must eventually succumb to our carefully reasoned arguments, we propose the following: 'if you can't beat them, join them'. What we of course mean by that glib little idiom, is that when we cannot overcome people's inbred habits and inclinations with cold hard logic, why not try to make use of the very fact that many behaviours are, at least to some extent, automatic in nature.

3.1. Making use of the automaticity of behaviour

Automaticity has been demonstrated to play a role in any number of behaviours. For some types of behaviours, this fact has been well established. The task of driving a car, for example, is widely accepted to become automatic in that after a certain amount of practice it does not require our express attention and we do it without really thinking about it [24]. It is not a far leap to consider that a degree of automaticity might also play a role in many traffic behaviours: people who violate speeding limits may not necessarily do so because they are ignorant or misinformed about the possible ramifications of their behaviour, or make a conscious decision to put the pedal to the metal.

The qualification of more complex behaviours as being in some part due to automatic rather than deliberate processes, however, is something that many people seem uncomfortable with [23]. Yet research has shown that any number of behaviours and even traits that are considered fairly stable can be influenced without us being aware of it. For example, having people make sentences with words generally associated with the elderly (e.g., bingo, begonias, and Florida) causes them to cross a certain distance more slowly than the people who were asked to do the same with neutral words [28]. Having them think and write about people generally thought to have above average intelligence (college professors) makes people perform better on intelligence tests [29].

3.1.1. Priming

The examples above describe something that is known as "priming": the activation of certain mental constructs or schemas by presenting people with sensory input (e.g., words, and images) that are closely associated with those constructs [30]. This activation in turn influences not only thought processes but actions and behaviours as well. Another example of this principle at work is by using visual rather than verbal stimuli: presenting people with a bill that has the logo of a credit card company on them, leads people to decide quicker on giving bigger tips. The credit card logos are closely associated with buying and spending, that it appears to lead people to do spend money more easily than when these constructs are not activated [31].

The same principles of priming may be applied for road safety campaigns, the advantage of such an approach being that it does not require people to actively process the campaign message and accompanying imagery. The research amassed on automatic behaviour and priming suggests that, when presented with certain images and words, people may automatically exhibit the behaviour that those stimuli invoke. This means that it is a matter of finding which images, words or otherwise invoke the behaviours one would like to see. For this purpose, carefully pretesting of possible stimuli may be the key.

The concept of priming is also of interest if one decides to go the more traditional route of using a campaign to inform or convince with information and reasoned arguments, if only to remind us that our often well-intentioned words and images may have the opposite effects of what we intend by them. For example, recent campaigns to prevent people from getting driving while fatigued showed people sleeping behind the wheel or depicted a car with a pillow where the steering wheel should be. These images are meant to visualize this phenomenon and remind people that getting behind the wheel when tired poses a real threat. It is possible, however, that such images may unwittingly invoke the very concept one is trying to prevent, and as such, may to a certain extent even induce the concept of sleepiness. To our knowledge, the evaluations carried out on such campaigns [32] have not included the measures necessary to ascertain whether such images have any unintended side effects. Rather, such evaluations include measures of knowledge, behavioural beliefs, intentions, risk comprehension and self-reported behaviour rather than the associations one has with the images and words in the campaign, let alone possible testing of whether people felt more or less fatigued after viewing them. Therefore, we cannot now conclude whether or not these images might have any such unintended side effects. However, we use this example to illustrate that

caution should be exercised in choosing the images and words used in a campaign. As was suggested earlier, to determine these potential side-effects, some form of (experimental) pretesting should be in order.

3.1.2. Modelling and social influence

The above paragraph dealt with the power of words, images and other such stimuli and the almost involuntary behaviour people may exhibit as a result of them. In much the same way, the same can be accomplished by presenting people with an example of the way we would like them to act rather than showing them how they should not. This is because we humans have a very strong tendency to mimic the behaviours we see in others. For example, we "whisper to someone who is whispering, we start to speak much louder when others do so" (p. 3, [30]). Leading by the right rather than the wrong example can therefore have the desired effect simply because we just cannot help mimicking people. Furthermore, by demonstrating the desired behaviour you are also playing on another important human tendency: to conform. People are less prone to exhibit behaviour that other people see as inappropriate. This is another good reason to emphasize that the desired behaviour is something everybody does and is perceived by the most people as normal and appropriate.

Many campaigns aimed at changing unwanted behaviour, however, feature people portraying the very behaviour that the campaign is supposed to discourage. Often, this is meant to raise awareness of a certain problem, or to hold up a "mirror" for the audience to look into. This is based on the contention that if people see how stupid, ugly, silly, etc., it looks when other people act a certain way, hopefully in the future they will think twice before acting like that themselves. However, "holding up a mirror" like that suggests that multiple people will be able to recognize themselves in the reflection. This, then, suggests that the behaviour portrayed is something that a lot of people already do, and therefore may act to *normalize* the very behaviour that it attempts to discourage. These types of campaigns may thus be ineffectual or even inadvertently enforce the unwanted behaviour. This once again underlines the importance not only of providing the target audience with the right example, but to carefully pretest these example to see if people see them the way they are meant to be seen.

3.1.3. Framing the message: losses or gains

Another way to subtly move people in the direction you want them to take, is by using the implication of the prospect theory [33]. This influential theory describes how differently people react to information based on whether they are framed as potential losses or potential gains. To illustrate this difference, consider having to make a choice of whether or not to undergo a medical procedure. If a doctor told his patient that "out of a hundred patients, 90% will still be alive five years after the operation", that patient will probably be inclined to go through with it. If, however, the doctor stated that "out of a hundred patients, 10% will die within five years after the operation", the patient will probably be a lot more reluctant to undergo what is essentially the same procedure (example courtesy of [34]).

Another example of the above principle at work comes from the research of Meyerowitz and Chaiken [35], who looked into ways to get more women to check for changes in their breast tissues in order to increase the likelihood of early detection of breast cancer. They did this by spreading several versions of the same brochure on this subject, one describing this procedure in terms of the potential gains ("by checking your breast tissue regularly, you will be more familiar with their texture which will make it easier to detect any eventual changes"), potential losses ("by not checking your breast tissue regularly, you will be less familiar with their texture which will make it harder to detect any eventual changes") or without any mention of either the potential losses or gains. In this particular case, it turned out that the brochure that was framed in terms of losses yielded the biggest results: 57% of the women that had received this version had started to check their breast

regularly in contrast to either the gain frame or neutral brochure that had only moved about 38% to do so.

Prospect theory may be applicable in the realm of road safety campaigns as well. Depending on the type of behaviour one is trying to encourage or discourage, it will be worthwhile to investigate whether different frames make a difference in getting people to behave as you would like them to. Again, the key to success would be to take the time to pretest different ways in which to frame the message you would like to get across before settling on any one tactic.

3.2. Informal education

One last thing to take into account is that the approaches illustrated above can be put to good use beyond trying to influence the behaviour of the target audience themselves. In order to maximize their potential impact, one might look beyond the principal targets of the message. Indeed, we do not just learn traffic behaviours from formal education and campaigning. Rather, a lot of what we learn comes from our own experiences and what we observe in others [1]. Therefore, it might be worthwhile to look not just at how we might influence the initial recipients of a campaign, but also at how these recipients might further influence others around them.

Of course, looking beyond the principal target of a campaign should not be to the detriment of the main objective: it is important to keep one's eye on the prize. However, sometimes it might even be expedient to look into such possibilities. For example, if young males seem elusive in their susceptibility to road safety campaigns, why not aim for their peers or other related groups who hold some sway over them, such as older, more experienced drivers who are less prone to risk taking and who might be convinced to lead by example. Or perhaps by persuading young women that it would be in their own best interest to withhold their admiration from the vehicular antics young males sometimes display when trying to impress the girls. Admittedly, whether these examples prove effective is conjecture at this point, although the former example has been implemented in another form in a number of countries, namely in the form of accompanied driving. In some countries novice drivers are only allowed to drive when they are accompanied by an experienced driver. Depending on the amount of kilometres driven, the supervisor's skills and the variation in routes, this approach has been known to garner some measure of success [36]. This does in no way provide any indication, however, that a road safety campaign encouraging older, more experienced drivers to share that experience and mentor younger drivers would have any effect at all. Yet again we will stipulate that it would take some form of pretesting to see if it is possible to obtain such indirect results by means of a road safety campaign.

Another example of this approach pertains to parents and children, who are uniquely positioned to mutually influence each other's behaviour. Indeed, this very fact proved very useful in a campaign aimed at encouraging seat belt use among kids, using toys that can be attached to the seat belt. Not only did seat belt use among children increase as a result of the campaign, but the children also encouraged their parents to wear their seat belt [37]. In their turn, parents influence their children because those children are young and impressionable and look to their parents to see how to behave. In a recent report on this last approach, many of the methods mentioned in this article are outlined in relation to how they might be of use for encouraging parents to take a more active role in their children's traffic participation ([38]; report in Dutch, with English summary).

4. Conclusion

Hopefully, with this article we accomplished what we set out to do, and that is to provide some inspiration for the future of road safety campaigns, whether this is ultimately achieved by having a good hard look at methods that are already widely implemented or by turning to new and alternative ways to influence road user behaviour. For this we should pay special attention to other disciplines studying human behaviour such as social psychology and economics. Here, interesting insights into human behaviour and behavioural modification can be found which may prove to be of use within the practice of road safety campaigns. One of the major current challenges in terms of research into influencing road user behaviour is to figure out whether the implication of these and other insights into human behaviour in general can be adapted to influence road user behaviour in particular, more specifically when designing road safety campaigns. Most importantly, and we cannot stress this enough, is that any and all forays into setting up a road safety campaign are formally and thoroughly evaluated. Because as they say, the proof is in the pudding, and the careful pretesting and evaluating of these and other approaches is the only way to determine whether the pudding is worth having.

References

[1] F.C.M. Wegman, L.T. Aarts (Eds.), Advancing Sustainable Safety: National Road Safety Outlook for 2005–2020, SWOV Institute for Road Safety Research, Leidschendam, 2006.

[2] P. Delhomme, W. De Dobbeleer, S. Forward, A. Simões (Eds.), Manual for Designing, Implementing, and Evaluating Road Safety Communication Campaigns, Directorate-General for Energy and Transport, European Commission, Brussels, 2009.

[3] A. Boulanger, M. Divjak, I. Orozova-Bekkevold, V. Zabukovec, Typology of Evaluation Methods: Current Practices and Campaign Evaluation; Deliverable 2.1 of Campaigns and Awareness Raising Strategies in Traffic Safety (CAST), Directorate-General for Transport and Energy, European Commission, Brussels, 2007.

[4] M. Peden, R. Scurfield, D. Sleet, D. Mohan, A.A. Hyder, E. Jarawan, C. Mathers (Eds.), World Report on Road Traffic Injury Prevention, World Health Organization, Geneva, 2004.

[5] R. Elvik, T. Vaa, A. Hoye, M. Sorensen (Eds.), The Handbook of Road Safety Measures, 2nd revised editionElsevier, Amsterdam, 2009.

[6] T. Vaa, T. Assum, P. Ulleberg, K. Veisten, Effects of Information Campaigns on Behaviour and Road Accidents: Conditions, Evaluation and Cost Effectiveness, Institute of Transport Economics, Oslo, Norway, 2004.

[7] A. Boulanger (Ed.), Evaluation Tool for Road Safety Campaigns, Directorate-General for Energy and Transport, European Commission, Brussels, 2009.

[8] A. Boulanger, A. Meng (Eds.), Reporting Tool for Effects of a Single Campaign, Directorate-General for Energy and Transport, European Commission, Brussels, 2009.

[9] T. Vaa, R. Philips, Effects of Road Safety Campaigns; Deliverable 1.3 of Campaigns and Awareness Raising Strategies in Traffic Safety (CAST), Directorate-General for Transport and Energy, European Commission, Brussels, 2009.

[10] SUPREME, Best Practices in Road Safety. Handbook for Measures at the Country Level, European Commission, Brussels, 2007.

[11] B. Elliott, Road safety campaigns: a meta-analysis, Report CR118, Department of Transport and Communications, Federal Office of Road Safety, 1993.

[12] R. Tay, B. Watson, Changing drivers' intentions and behaviours using fear-based driver fatigue advertisements, Health Marketing Quarterly 19 (4) (2002) 55–68.

[13] R. Tay, The effectiveness of enforcement and publicity campaigns on serious crashes involving young male drivers: are drink driving and speeding similar? Accident Analysis & Prevention 37 (5) (2005) 922–929.

[14] R. Tay, B. Watson, S. Hart, Personal and social influences of speeding, Proceedings of the Third International Conference on Traffic and Transportation Studies, American Society of Civil Engineers, Reston, 2002.

[15] W.H. Weenig, C.J.H. Midden, Mass media information campaigns and knowledge gap effects, Journal of Applied Social Psychology 27 (1997) 945–958.

[16] K. Witte, M. Allen, A meta-analysis of fear appeals: implications for effective public health campaigns, Health Education & Behavior 27 (5) (2000) 608–632.

[17] R.A.C. Ruiter, C. Abraham, G. Kok, Scary warnings and rational precautions: a review of the psychology of fear appeals, Psychology and Health 16 (2001) 613–630.

[18] SWOV, Fear-based information campaigns, SWOV-factsheet, April 2009, SWOV Institute for Road Safety Research, Leidschendam, 2009.

[19] C. Goldenbeld, D. Twisk, S. Houwing, Effects of persuasive communication and group discussions on acceptability of anti-speeding policies for male and female drivers, Transportation Research Part F; Traffic Psychology and Behaviour, vol. 11, nr. 3 2008, pp. 207–220.

[20] I. Lewis, B. Watson, R. Tay, Examining the effectiveness of physical threats in road safety advertising: the role of the third-person effect, gender, and age, Transportation Research Part F. 2007 /01. 10(1) 2007, pp. 48–60.

[21] D. Kahneman, New challenges to the rationality assumption, Journal of Institutional and Theoretical Economics 150 (1994) 18–36.

[22] A. Tversky, D. Kahneman, Rational choice and the framing of decisions, Journal of Business 59 (1986) S251–S278.

[23] J.A. Bargh, The Automaticity of Everyday Life, in: R.S. Wyer Jr. (Ed.)Advances in Social Cognition, Vol. 10, Erlbaum, Mahwah, NJ 1997, pp. 1–61.

[24] J.A. Bargh, E. Morsella, The unconscious mind, Perspectives on Psychological Science 3 (2008) 73–79.

[25] J.A. Bargh, The four horsemen of automaticity: awareness, efficiency, intention, and control in social cognition, in: R.S. Wyer Jr., T.K. Srull (Eds.), Handbook of Social Cognition, 2nd ed.Erlbaum, Hillsdale, NJ 1994, pp. 1–40.

[26] G.R. Maio, B. Verplanken, A.S.R. Manstead, W. Stroebe, C.S. Abraham, P. Sheeran, M. Conner, Social psychological factors in lifestyle change and their relevance to social policy, Social Issues and Policy Review 1 (2007) 99–138.

[27] B. Verplanken, W. Wood, Interventions to break and create consumer habits, Journal of Public Policy & Marketing 25 (2006) 90–103.

[28] J.A. Bargh, M. Chen, L. Burrows, Automaticity of social behavior: direct effects of trait construct and stereotype activation on action, Journal of Personality and Social Psychology 71 (2) (1997) 230–244.

[29] A. Dijksterhuis, A. Van Knippenberg, The Perception–Behavior Expressway: Automatic Effects of Social Perception on Social Behaviour, in: M.P. Zanna (Ed.) Advances in experimental social psychology, 33, Academic Press, San Diego 1998, pp. 1–40.

[30] A. Dijksterhuis, J.A. Bargh, The Perception–Behavior Expressway: Automatic Effects of Social Perception on Social Behavior, in: M.P. Zanna (Ed.) Advances in Experimental Social Psychology, 33, Academic, San Diego 2001, pp. 1–40.

[31] R.A. Feinberg, Credit cards as spending facilitating stimuli: a conditioning interpretation, Journal of Consumer Research 13 (1986) 348–356.

[32] W. De Dobbeleer, T. Nathanail, G. Adamos, Pan-European Road Safety Campaign: Campaign Evaluation; Deliverable 5.3 of Campaigns and Awareness Raising Strategies in Traffic Safety (CAST), Directorate-General for Transport and Energy, European Commission, Brussels, 2009.

[33] A. Tversky, D. Kahneman, The Framing of Decisions and the Psychology of Choice, Science, vol. 185, 1981, pp. 453–458.

[34] R.H. Thaler, C.R. Sunstein, Nudge; Improving Decisions About Health, Wealth and Happiness, Expanded edition Penguin Group, New York, 2009.

[35] B.E. Meyerowitz, S.E. Chaiken, The effect of message framing on breast-self examination: attitudes: attitudes, intentions, and behavior, Journal of Personality and Social Psychology, 52, 3, 1987, pp. 500–510.

[36] SWOV, Accompanied driving, SWOV-Factsheet, January 2009, SWOV Institute for Road Safety Research, Leidschendam, 2009.

[37] P. Silverans, P. de Neve, SUPREME; Thematic Report Education and Campaigns, Directorate-General for Transport and Energy, European Commission, Brussels, 2007.

[38] A.T.G. Hoekstra, D. Twisk, Informele educatie SWOV Institute for Road Safety Research, R-2010-19 Leidschendam, 2010.

[39] R. Tay, L. Ozanne, Who are we scaring with high fear road safety advertising campaigns? Asia Pacific Journal of Transport 4 (Summer 2002) 1–12.