

Development and evaluation of a mass media Theory of Planned Behaviour intervention to reduce speeding

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Abstract

The Theory of Planned Behaviour (TPB) has been widely applied to the explanation of health and social behaviours. However, despite its potential to inform behaviour change efforts, there have been surprisingly few attempts to use the TPB to design actual interventions. In 1998, the Scottish Road Safety Campaign implemented a 3-year mass media campaign to reduce speeding on Scotland's roads which was explicitly shaped by the TPB's three main predictors: Attitude, Subjective Norms and Perceived Behavioural Control. A 4-year longitudinal cohort study examined the impact of the campaign on communications outcomes and on TPB constructs. Overall, empirical support was found for the decision to use TPB as the theoretical underpinning of the advertising. The advertising was effective in triggering desired communications outcomes, and was associated with significant changes in attitudes and affective beliefs about speeding. In conclusion, future directions for road safety advertising and for TPB research are discussed.

Introduction

The Theory of Planned Behaviour (TPB)

TPB, an extension of Fishbein and Ajzen's (Fishbein and Ajzen, 1975) Theory of Reasoned Action (TRA), posits that behaviour is determined by behavioural intention, which is in turn predicted by Attitude to the behaviour, Subjective Norms and Perceived Behavioural Control (PBC) (Ajzen, 1988). Attitude is predicted by *instrumental beliefs* about the consequences of performing the behaviour (e.g. 'it will save time'), weighted by *outcome evaluations* of the desirability of those consequences (e.g. 'saving time would be a good/bad thing'). Subjective Norms are predicted by *normative beliefs* about whether significant 'referents' (e.g. mother, partner) would approve of one performing the behaviour in question, weighted by one's *motivation to comply*—to behave in a manner which would meet each referent's approval. PBC is thought to influence behaviour both directly and through behavioural intentions. PBC can be defined simply as perceived ease of performing or refraining from a particular behaviour, or as the product of two sets of factors—*control beliefs* about one's ability to perform or refrain from the behaviour in various circumstances and *control frequency*: how often one is in those circumstances (see Figure 1).

The TPB has been widely applied to health behaviours including diet (Dennison and Shepherd, 1995; Conner *et al.*, 1996; Povey *et al.*, 2000), contraceptive use (Jamner *et al.*, 1998), exercise (Courneya *et al.*, 2001), substance use (Conner and Sherlock, 1998; Godin *et al.*, 1992), attendance for health screening (Rutter, 2000) and road safety

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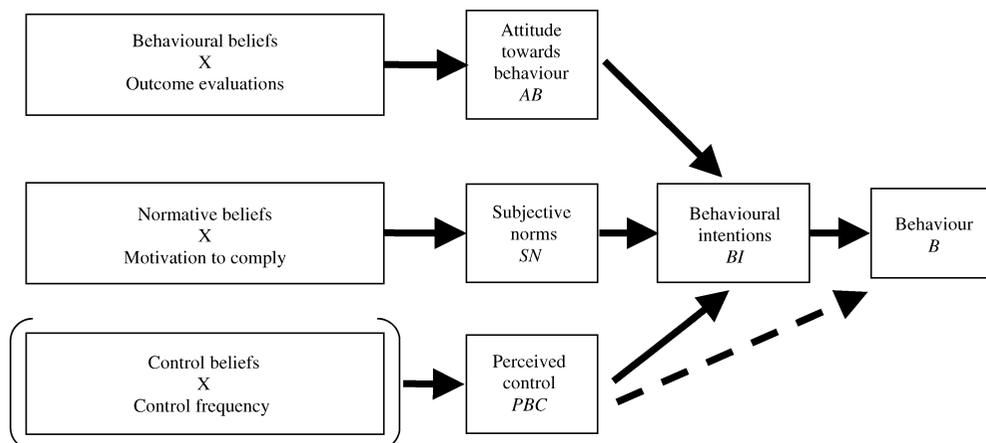


Fig. 1. The TPB [adapted from (Conner and Sparks, 1995)].

(Manstead, 1991; Parker *et al.*, 1992, 1995; Stradling and Parker, 1996; Evans and Norman, 1998; Quine *et al.*, 1998; Carcary *et al.*, 2001), and has been found capable of explaining, on average, around 40% of the variance in health intentions and behaviour (Rutter and Quine, 2002). Consequently, it has been claimed that the model has tremendous potential to inform the development of behaviour change interventions [e.g. (Rutter, 2000; Armitage and Conner, 2002; Hardeman *et al.*, 2002)].

Despite this, there have been surprisingly few attempts to use the TPB as the basis of health behaviour campaigns (Armitage and Conner, 2002) and ‘well-designed studies that evaluate carefully developed interventions, specifically targeting TPB components and measuring the effect on cognitions as well as behaviour, are needed to provide evidence about the utility of the TPB in this area’ [Hardeman *et al.*, 2002), p. 151]. Two notable smaller-scale examples are a TPB-based drama intervention to increase adolescent pedestrian safety (Evans and Norman, 2002) and a TPB-based booklet to encourage schoolchildren’s cycle helmet use (Quine *et al.*, 2002). However, many of what are described as TPB intervention studies use the model to provide outcome measures against which to track effects, but not to design the intervention itself [e.g. (Bamberg and Schmidt, 1998; Hardeman *et al.*, 2002)]; others use the TPB to design an intervention, but do not

then measure impact on the targeted TPB predictors [e.g. (Hardeman *et al.*, 2002; Reger *et al.*, 2002)]. The Foolsspeed campaign set out to do both: to use TPB to design a large-scale intervention and to use TPB to assess its impact.

Speeding and the TPB

Clearly, deterrence and enforcement are important measures for reducing the incidence of speeding. However, if the psychological mechanisms which motivate drivers to speed can be identified, then there is the potential to develop interventions which, by influencing those mechanisms, lead to changes in speeding behaviour (Parker *et al.*, 1996). The tendency for drivers to have an illusory sense of control over their driving—to feel more in control than they actually are—and to exaggerate their own ability is a powerful contributor to driving violations in general and speeding in particular [e.g. (McKenna, 1991; Simon and Corbett, 1991)]. Compared with non-speeders, speeders tend to rate any adverse consequences of speeding both as less likely to occur and as less undesirable [e.g. (Stradling, 1999)]. Furthermore, they perceive more benefits in speeding, both at an instrumental level (getting somewhere quicker) and at an emotional level (the pleasure of going fast) (Vogel and Rothen-gatter, 1984; Corbett, 1991; Stradling, 1999). Compared to drink-driving, speeding attracts little

stigma [e.g. (Corbett, 1991)], suggesting that social norms play an important role in legitimizing it as a normative, majority behaviour [e.g. (Stradling, 1999)]. The TPB's emphasis on attitudes, norms and control provides a useful model for describing these psychological influences on speeding. Previous studies have shown that the TPB is able to account for significant amounts of variance in intentions to speed [e.g. (Manstead, 1991; Parker *et al.*, 1992, 1995; Stradling and Parker, 1996)]. Studies also suggest that 'Affective Beliefs'—beliefs about the emotions one might experience while performing a behaviour as opposed to instrumental beliefs about its consequences—capture an important facet of driving behaviour and represent a useful addition to the TPB model (Stradling and Parker, 1996; Lawton *et al.*, 1997). Positive Affective Beliefs might include pleasure in the sensation of speed, while Negative Affective Beliefs might include anxiety about appearing foolish or discourteous to other road users (Lawton *et al.*, 1997).

Consequently, road safety researchers interested in the TPB have suggested that there is potential for interventions which target: (1) *behavioural beliefs* about the consequences of speeding, particularly the likelihood of being caught by the police, putting pedestrian lives at risk or causing an accident; (2) *normative beliefs* about how significant others such as family and friends perceive speeding; and (3) *PBC*, by reminding drivers that they are in charge of their own driving decisions and have a choice about their speed (Manstead, 1991; Parker and Stradling, 2001). This potential was lent support by a laboratory-based experiment in which four short videos, each addressing a cluster of beliefs about speeding in a residential area, produced some significant attitudinal changes (Parker *et al.*, 1996; Parker, 2002).

Development of Foolsspeed

The Scottish Road Safety Campaign Foolsspeed campaign (1999–2001) was the first UK attempt to develop a large-scale driving behaviour intervention explicitly informed by the TPB. It comprised mass media advertising complemented by public relations and corporate sponsorship. The campaign

target was the general driving population in Scotland, although a key target subgroup was drivers with a known tendency to speed, particularly 25- to 44-year-old males in social classes ABC1 (professional, white collar and clerical workers). Three television/cinema advertisements, targeting Attitude, Subjective Norms and PBC, respectively, were screened in the Spring of each of the three years (Table I). Content specifications and creative briefs for each advertisement were developed using a two-stage process. First, previous TPB studies into driving violations (Manstead, 1991; Stradling and Parker, 1996; Parker *et al.*, 1996; Lawton *et al.*, 1997) were consulted to identify the specific component beliefs likely to be most salient in the formation of Attitude, Subjective Norms and PBC regarding speeding. Second, formative research (eight focus groups with male and female drivers aged 18–44) was conducted to explore beliefs and norms about speeding, and feelings about road safety advertising.

The formative research suggested that key elements of the campaign would be credibility—i.e. the depiction of realistic, non-extreme driving events—and empathy with the daily pressures experienced by drivers, such as congestion and 'hassle'. It was decided that in order to increase identification with the advertising, a low-key style depicting everyday driving scenarios was more appropriate than a hard-hitting approach. Although fear-arousing road safety advertising *can* be effective in generating awareness [e.g. (Donovan *et al.*, 1999; Harrison and Senserrick, 2000)], there is the risk that viewers avoid such advertising because it is too distressing or discount it as unrealistic, not personally relevant and lacking in credibility (Job, 1990; deTurck *et al.*, 1992; Witte *et al.*, 1998; Snipes *et al.*, 1999; Blumberg, 2000; Ruiter *et al.*, 2001). The Foolsspeed campaign would test out whether a more empathetic and credible style of road safety advertising (Slater, 1999) could be equally, if not more, effective in engaging audiences. Consistent with this emphasis, it was also decided that the advertising would feature recognizable locations such as well-known Glasgow streets.

Table 1. *The three Foolsspeed TPB ads*

Ad	Designed to address	Outline of ad
Mirror (first screened 1999)	Attitude	<p>Sought to challenge the beliefs that speeding in town saves time, that a speeding driver is fully in control of the car, that he or she is able to stop quickly in an emergency if necessary and that speeding can cause accidents—beliefs which research suggests are key in the formation of attitudes towards speeding [e.g. (Parker and Stradling 2001)].</p> <p>A male driver in his 30s is driving down residential streets. His alter ego/conscience appears in the rear-view mirror and points out the foolishness of urban speeding by noting that a car from which the driver previously raced away has caught up with him at the traffic lights. As the driver nears a school, the conscience argues that he should slow down, to which the driver retorts that he ‘is a better driver than most’ (the implication being that he can therefore handle speed safely). The driver’s attention is momentarily distracted by a young woman walking along the pavement with a small child and when he looks back at the road he is shocked to realize that the car in front has stopped at a school crossing. The driver comes to a noisy halt and the conscience shakes his head in the mirror. The strapline reads ‘Take a good look at yourself when you’re driving’.</p>
Friends and Family (first screened 2000)	Subjective Norms	<p>Sought to highlight the mismatch between a driver’s own favourable view of his driving and the irritation and anxiety it may arouse in his passengers, and to increase the driver’s motivation to drive more safely to please others around him.</p> <p>A male driver in his 30s was featured with two significant others likely to be particularly influential, a female partner and a male friend/colleague (Parker and Stradling, 2001). The ad begins with the female partner, at home, describing how ‘he becomes a different person, totally unrecognizable’. The family are then shown in the car, with the driver speeding and his partner protesting as the speed of the car jolts their young son’s neck, in the back of the car. She wishes her partner could ‘see things through her eyes’. A male friend/colleague of the driver then addresses the camera, also expressing his disapproval of his friend’s ‘boy racer’ behaviour. The two friends are then shown in the car, where the friend is annoyed because he spills juice down his sweater as a result of the driver’s hasty acceleration. The ad closes with the driver alone in the car and the voice-over ‘Put yourself in the passenger seat. If you don’t, others won’t’.</p>
Simon Says (first screened 2001)	PBC	<p>Sought to increase drivers’ control over their speeding. The creative brief for the advertising postulated that the advertisement should seek to challenge drivers with the sentiment ‘you’re responsible for the way you drive’, by depicting typical internal and external pressures which encourage drivers to speed and demonstrating that it is possible and desirable to withstand such pressures.</p> <p>Three different drivers and driving scenarios are depicted in the ad, with a nursery rhyme-style voiceover on the theme of the children’s game ‘Simon Says’. The three scenarios illustrate the pressure of being in a flow of traffic going at 40 m.p.h. in a 30 m.p.h. limit, the pressure of being late for work, and the more direct pressure of an impatient driver (a ‘white van man’) behind. In the latter scenario, the driver nearly hits a cyclist as a result of being distracted and pressurized by the white van driver. The ad closes with the strapline ‘Be your own man’.</p>

Creative concepts for the three ads were then developed by an advertising agency and taken, in storyboard form with narrative audiotape, into subsequent stages of consumer research with a sample of the target audience (six focus groups each year for 3 years). Findings from these exercises were used to refine the ads further before final production.

Method

A 4-year longitudinal cohort study was conducted with 550 drivers, aged 17–54, in Renfrew, an area whose affluence/deprivation profile is representative of the overall Scottish population (McLoone, 1991). Following a thorough qualitative and quantitative pilot of the questionnaire, a baseline survey took measures of respondents' demographic and driving characteristics, and of the full raft of TPB constructs (Figure 2). Follow-up surveys, in Spring 1999, Spring 2000 and Summer 2001, repeated all the baseline measures, and also assessed response to the advertising in terms of awareness, recall, comprehension, identification, involvement and perceptions of key messages. The sample, recruited door-to-door, was selected to be representative of the 17- to 54-year-old driving population, with interlocking quota controls on age and sex. Respondents had to be in possession of a current driving license and drive at least once per week. The achieved sample at the second survey was 388, at the third survey 367 and at the fourth survey 287.

Data were collected using an in-home face-to-face 20- to 40-min questionnaire administered by professional market research interviewers. A 10% quality check was conducted on all interviews to ensure correct administration. To encourage respondent cooperation, personalized mailouts were sent out annually, and a £5 gift voucher incentive was offered at the third and fourth surveys.

Results

The evaluation sought to answer three questions. First, was the TPB an appropriate theoretical basis

for the campaign: could it satisfactorily explain and predict the variations in speeding behaviour among Scottish drivers? Second, was a campaign based on the TPB capable of 'working' in communication terms: was it memorable, engaging and 'on message'? Third, was the campaign effective in influencing the psycho-social determinants of speeding on which it was based? Main findings are reported here; a fuller set of findings is reported separately (Stead *et al.*, 2002).

Was the TPB able to predict variance in speeding?

Multiple regression analyses found that the basic TPB was able to predict between 47 and 53% of the variance in intentions to speed (when analysed cross-sectionally at each survey stage), and between 33 and 40% of the variance in reported speeding behaviour (speeding on a 30 m.p.h. road) (Table II). The amount of variance explained in intentions was highest at the second survey (53%), although Subjective Norms did not significantly contribute to the model at this stage. PBC was the most powerful independent variable associated with intentions to speed at each survey stage.

The TPB model's predictive ability over time was also examined. Table III shows the ability of baseline measures and other variables, including campaign awareness, to predict speeding intentions and behaviour four years later. All variables were entered into the model in one step. Where the dependent variable was intentions, the amount of variance explained was 27%. Significant predictors of intentions to speed at the fourth survey were Attitude, PBC, Subjective Norms and age (being younger). Awareness of the campaign, gender and social class were not significant predictors of intentions to speed. Where the dependent variable was reported behaviour, the amount of variance explained was slightly lower, at 22%. Reported speeding behaviour at the fourth survey was predicted by higher baseline measures of PBC and intentions to speed, and being younger. Again, awareness of the campaign, gender and social class were not significant predictors.

Respondents were asked to make judgments about their own views and behaviour in the scenario below:

*You are driving in your car or van down a road in town. There are some shops and parked cars. It is about 2 o'clock on a fine dry afternoon. There are no other cars driving on the road. The speed limit is 30 m.p.h. [Adapted from (Parker *et al.*, 1992)]*

- *Behavioural intentions* were measured using three statements: 'I would probably drive faster than 30 m.p.h. myself in this situation', 'I would never drive faster than 30 m.p.h. in this situation' and 'In this situation I would want to drive faster than 30 m.p.h.'. Reliability analysis showed that these items were highly consistent ($\alpha = 0.81$).
- Eight *behavioural beliefs* about the consequences (both good and bad) of driving at 40 m.p.h. in the scenario were used. These were identified from formative research, questionnaire piloting and from other studies [e.g. (Parker *et al.*, 1996; Stradling and Parker, 1996; Lawton *et al.*, 1997)]. Respondents were asked to indicate how likely or unlikely they judged each of the consequences (e.g. 'If I drove down this road at 40 m.p.h. I would find it difficult to stop in an emergency'). Reliability for these items was relatively high ($\alpha = 0.71$).
- *Outcome evaluations* were measured using eight statements corresponding to the behavioural beliefs. Respondents were invited to indicate how desirable or undesirable each outcome would be. These two sets of items were summed using the TPB formula to produce a composite *attitude towards the behaviour*. Reliability for these items was adequate ($\alpha = 0.60$).
- *Normative beliefs* were measured with 11 items in which respondents were asked to indicate how much various significant others (or 'salient referents') would approve or disapprove of their speeding (i.e. driving at 40 m.p.h.) in the scenario described. Again, these salient referents were identified from the piloting exercise and from previous studies [e.g. (Parker *et al.*, 1992)].
- *Motivation to comply* was assessed by asking respondents to indicate the extent to which they generally liked to drive in a manner of which each referent would approve. These two sets of items were summed using the TPB formula to produce a composite *subjective norm score*. Reliabilities for the two sets of items were high (normative beliefs: $\alpha = 0.70$, motivation to comply: $\alpha = 0.85$).
- *Perceived behavioural control* was measured by asking respondents whether, in eight different circumstances, they would be more or less likely to speed (e.g. 'if you were running late for an appointment?'). A corresponding set of eight items asked respondents how often they found themselves in such circumstances when driving. These two sets of items, *control beliefs* and *control frequency*, were summed to produce a composite *perceived behavioural control*. Reliability was high for the control beliefs ($\alpha = 0.88$) but low for the control frequencies ($\alpha = 0.31$). An alternative simpler measure of perceived behavioural control was also obtained, using two items, 'I would find it frustrating/I would find it easy to stick to 30 m.p.h. in this situation'. The different measures were used because there appears limited consensus on how control should be operationalized within the TPB. Reliability for the alternative measure of perceived behavioural control was high ($\alpha = 0.80$).
- *Positive affective beliefs (PABs)* and *negative affective beliefs (NABs)*. These were measured with three items for each (e.g. positive: 'Driving down this road at 40 m.p.h. would give me a feeling of pleasure'; negative: 'If I drove down this road at 40 m.p.h. I would feel that I was driving foolishly'). A corresponding outcome evaluation statement was added for each item. Reliability for the PABs was 0.59 (0.70 for the corresponding outcome evaluations). Reliability for the NABs was 0.70 (0.63 for the corresponding outcome evaluations).
- *Reported behaviour* was measured by asking respondents how often, in the past 12 months, they had driven over the speed limit in three different circumstances: on a 30 m.p.h. road, late at night or early in the morning, and on a motorway.

A seven-point response scale (e.g. Never–Almost all the time; Very likely–Very unlikely) was used for all measures.

Fig. 2. TPB measures used in the survey.

Table II. Multiple regressions examining association between: (1) intentions and attitude, subjective norms, perceived behavioural control; and (2) behaviour and intentions, perceived behavioural control

	Baseline		Second survey		Third survey		Fourth survey	
	Int (<i>N</i> = 511)	Beh (<i>N</i> = 526)	Int (<i>N</i> = 377)	Beh (<i>N</i> = 381)	Int (<i>N</i> = 360)	Beh (<i>N</i> = 362)	Int (<i>N</i> = 278)	Beh (<i>N</i> = 281)
Adjusted <i>R</i> ²	0.467	0.331	0.527	0.356	0.492	0.404	0.494	0.348
β								
Intentions		0.409 ^c		0.363 ^c		0.447 ^c		0.418 ^c
Attitudes	0.238 ^c		0.231 ^c		0.150 ^b		0.228 ^c	
Subjective Norms	0.158 ^c		0.063		0.128 ^b		0.144 ^b	
PBC	0.426 ^c	0.226 ^c	0.549 ^c	0.288 ^c	0.540 ^c	0.243 ^c	0.462 ^c	0.229 ^c

^a*P* < 0.05; ^b*P* < 0.01; ^c*P* < 0.001.

Adjusted *R*² (percentage of variance explained) is shown in the top row. The βs are shown for Intentions, Attitude, Subjective Norms and PBC.

Table III. Multiple regressions examining association between: (1) behavioural intentions (at fourth survey) and attitude, subjective norms, perceived behavioural control (at baseline), campaign awareness and demographics; and (2) reported behaviour (at fourth survey) and intentions, perceived behavioural control (at baseline), campaign awareness and demographics

	Fourth survey	
	Intentions (<i>N</i> = 269)	Behaviour (<i>N</i> = 275)
Adjusted <i>R</i> ²	0.266	0.217
β		
Intentions at baseline		0.215 ^b
Attitude at baseline	0.170 ^b	
Subjective Norms at baseline	0.165 ^a	
PBC	0.207 ^b	0.199 ^b
Awareness of 'Mirror' ad at any survey	0.039	-0.013
Awareness of 'Friends and Family' ad at any survey	0.042	0.068
Awareness of 'Simon Says' ad at fourth survey	-0.034	0.005
Gender	-0.014	-0.075
Social class	-0.067	0.003
Age	-0.231 ^c	-0.220 ^c

^a*P* < 0.05; ^b*P* < 0.01; ^c*P* < 0.001.

Adjusted *R*² (percentage of variance explained) is shown in the top row. The βs are shown for the TPB components, awareness of Foolsspeed advertising measures and demographic characteristics.

Did the campaign generate desired communication outcomes?

Between a fifth and a third of respondents over the three surveys spontaneously recalled having seen any Foolsspeed advertising on television. At a prompted level, the Attitude ad had the highest recall level, 74% in Spring 1999 rising to 86% in both subsequent years, while the Subjective Norms and PBC ads had lower levels of prompted recall

in the years they were first screened (55 and 53%, respectively).

A series of bipolar scales examined respondents' liking, comprehension, identification and involvement with the advertisements. The majority of respondents liked the Attitude ad, found it easy to understand, considered that it did not 'talk down' to them and made them think about their own driving. When responses were analysed by frequency of

reported speeding (Figure 3), ‘frequent speeders’ were more likely than infrequent speeders to feel that the ad was targeted at them and to agree that it made them feel that they ‘drove too fast’ (Figure 4).

Similar responses were found for the PBC ad. Agreement with the items ‘the ad made me feel I need to have more control over my speed’, ‘the ad made me feel bad about how I drive’ and ‘the ad made me feel that I drive too fast’ increased with more frequent speeding behaviour, suggesting that, as with the Attitude ad, it was more successful in encouraging self-awareness and dissonance among frequent than infrequent speeders (Figure 5). The Subjective Norms ad triggered similar responses, although differences between frequent and infrequent speeders were less pronounced than with the other two ads.

Did the campaign influence the TPB determinants of speeding?

Scores for all the main TPB constructs, plus additional components such as Positive and Negative Affective Beliefs, were compared between the baseline and follow-up surveys to assess whether any changes occurred over the period of the research in the sample as a whole. Results were then analysed by awareness of the relevant Foolsspeed ad (e.g. Attitude scores were analysed by awareness of the Attitude ad, etc.) to assess whether any changes were associated with exposure to the campaign.

Attitude

Table IV displays Attitude scores at an individual item and composite level for the sample as a whole,

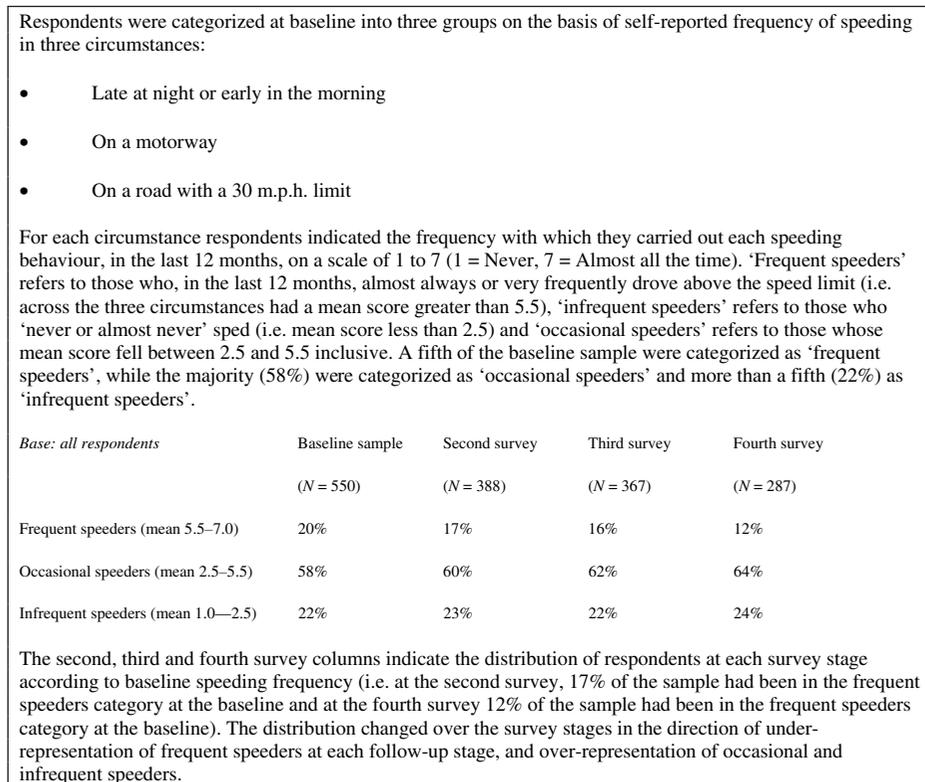


Fig. 3. Speeding frequency profile.

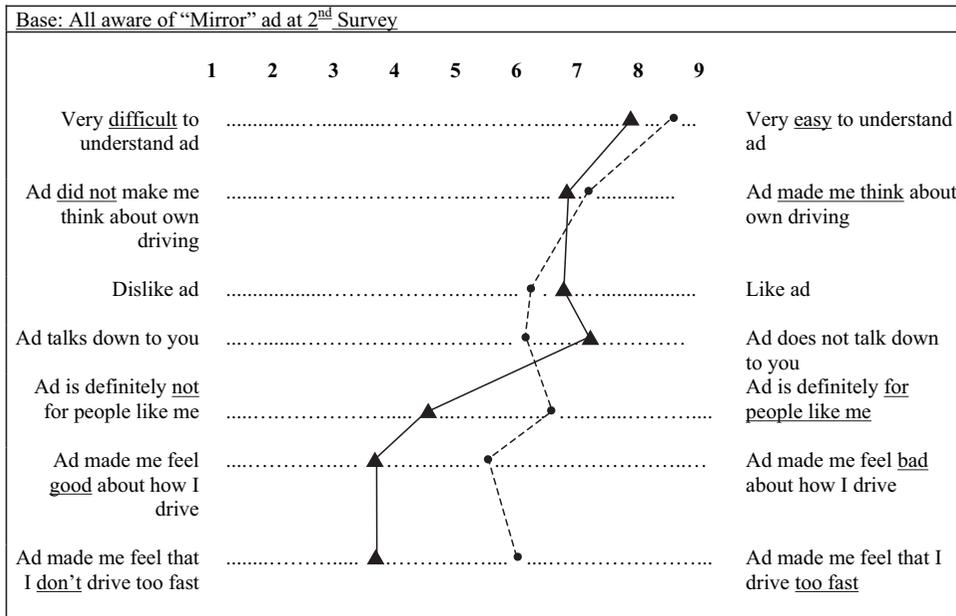


Fig. 4. Prompted opinions of Mirror (Attitude) ad, by frequency of reported speeding. Base: all aware of 'Mirror' ad at second survey. ●: Frequent speeders (48); ▲: infrequent speeders (57).

comparing the baseline and second survey scores (those obtained after the first screening of the ad). Two of the belief items displayed a significant change, in an anti-speeding direction, between the baseline and second survey ('finding it difficult to stop quickly in an emergency' and 'driving at what you feel is a comfortable speed'). Between the baseline and third survey, combined scores for *four* of the items became significantly more anti-speeding: 'difficult to stop quickly in an emergency' (baseline -2.69, third survey -3.41, $P < 0.05$), 'being able to keep up with the flow of traffic' (baseline 1.30, third survey 0.89, $P < 0.05$), 'driving at what you feel is a comfortable speed' (baseline 0.18, third survey -0.52, $P < 0.01$) and 'saving time' (baseline 1.08, third survey 0.45, $P < 0.01$). However, by the fourth survey, only two of the items displayed a significant change and one of these changes was in the 'wrong' direction (i.e. more pro-speeding): 'causing an accident' (baseline -1.84, fourth survey -1.11, $P < 0.05$, pro-speeding direction) and 'driving at what you

feel is a comfortable speed' (baseline 0.02, fourth survey -0.65, $P < 0.05$, anti-speeding direction).

The changes in individual behavioural beliefs were strong enough to produce a significant change (in an anti-speeding direction) between the baseline and second survey in the overall Attitude to the Behaviour score and this change was sustained at the third survey. However, by the fourth survey this change in attitude towards speeding was no longer apparent.

In order to assess whether attitudinal changes were associated with the Foolspeed campaign, scores for those who had seen the Attitude ad were then compared with scores for those who had not, at each survey stage. This analysis revealed that the change in the composite Attitude to the Behaviour, observed at the second and third surveys, was associated with having seen the ad at the third survey (Seen: baseline -5.85, third survey -7.96, $P < 0.05$; Not seen: baseline -3.70, third survey -5.91, NS), although it was not associated with awareness of the ad at the second survey. In addition, the majority of the

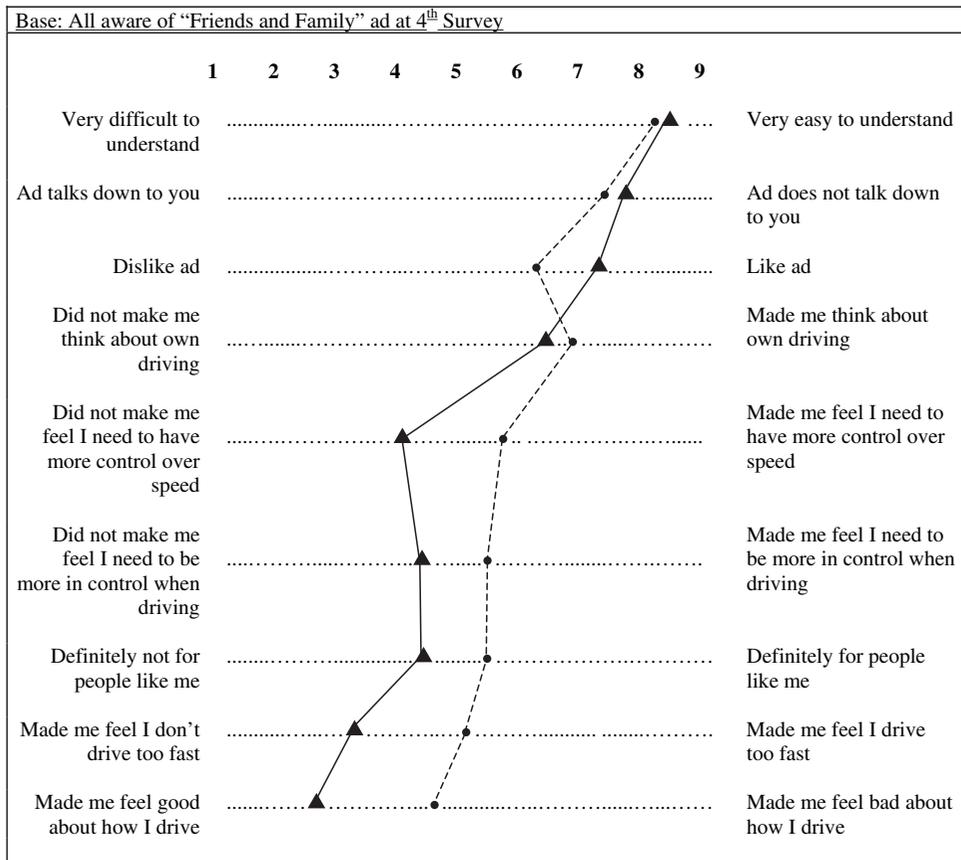


Fig. 5. Prompted opinions of Simon Says (PBC) ad, by frequency of reported speeding. Base: all aware of 'Friends and Family' ad at fourth survey. ●: Frequent speeders (21); ▲: infrequent speeders (31).

changes in individual beliefs which make up attitudes were associated with awareness of the ad. Overall, the results suggested that the Attitude ad had had a moderately favourable effect on beliefs and attitudes, and that this effect was strongest at the third survey.

Positive Affective Beliefs and Negative Affective Beliefs

Although the three Foolsspeed ads were not designed specifically to address affective beliefs, these were measured at each stage to assess whether they displayed any changes during the campaign. Between the baseline and the second survey, Negative Affective Beliefs (NAB) increased significantly and Positive Affective Beliefs

(PAB) decreased significantly, i.e. both became more strongly anti-speeding (NAB: baseline 73.45, second survey 76.44, $P < 0.05$; PAB: baseline 71.53, second survey 68.26, $P < 0.05$). At the third survey, only the NAB displayed a significant change from the baseline (baseline 71.98, third survey 75.93, $P < 0.05$), but at the fourth survey both the composite NAB and the composite PAB again displayed significant changes, in the same anti-speeding direction as at the second survey (NAB: baseline 74.35, fourth survey 80.47, $P < 0.01$; PAB: baseline 71.04, fourth survey 67.00, $P < 0.01$).

Subsequent analysis by awareness of the Foolsspeed campaign revealed a strong association with

awareness of the Attitude ad. All of the significant changes in affective beliefs, apart from the increase in Negative Affective Beliefs between the baseline and second survey, were significantly associated with awareness of the ad at each survey stage. This suggests that the Attitude ad influenced beliefs about the *emotional* benefits of speeding as well as beliefs about its instrumental benefits.

Subjective Norms

There was no change in Subjective Norms for the sample as a whole between the baseline and third survey (after the first screening of the Subjective Norms ad). Several of the scores for individual referents changed significantly, in the direction of discouraging speeding, between the baseline and third survey, although others changed in the opposite direction, but these changes were not large enough to produce a change in overall Subjective Norms.

Individual item and composite Subjective Norms scores for those who had seen the ad were then compared with the scores for those who had not. Those who saw the ad displayed significantly more negative scores at the third survey compared to the baseline for two of the referents, 'boss' and 'people you work with', i.e. they perceived them as more disapproving of speeding, while those who did not see the ad displayed no changes for any of the referents. At the fourth survey, those who had seen the ad displayed significant changes in normative beliefs scores for five of the referents. Three referents were perceived as *more* disapproving of speeding: 'boss', 'people you work with' and 'a competent driver', while two referents, 'father' and 'mother', were perceived as *less* disapproving of speeding. Those who had *not* seen the ad at the fourth survey displayed only one significant change, perceiving 'the police' as less disapproving of speeding. Overall, the analysis suggests that the ad had, at best, only a weak effect on Subjective Norms.

PBC

There was no change in PBC scores between baseline and fourth survey (after the PBC ad).

Some minor changes were observed in scores for the items which make up PBC, although these were in both anti- and pro-speeding directions. There was an unclear relationship between these minor changes and awareness of the advertising, i.e. some favourable changes were found in those who both had and had not seen the ad, as were some unfavourable changes. Overall, the PBC ad did not appear to have affected PBC.

Behavioural intentions and reported behaviour

Behavioural intentions displayed no significant changes between baseline and any subsequent survey stage, and there was no evidence of any association with campaign awareness. Reported frequency in the last 12 months of speeding 'on a 30 m.p.h. road' appeared to decrease significantly between the baseline and third survey and between the baseline and fourth survey. Repeated measures ANOVA revealed no significant interaction between awareness of any of the ads and reported speeding behaviour on a 30 m.p.h. road.

Discussion

The TPB provides a useful model for explaining, and potentially for changing, health behaviours. However, there is little guidance in the large body of TPB research on *how* to use the model to change behaviour (Quine *et al.*, 2001). Many 'TPB intervention studies' use the TPB as a tracking device to assess intervention effectiveness, rather than (also) as a tool for developing the intervention, or they use TPB to design messages, but do not evaluate the impact of those messages on the TPB's behavioural predictors (Hardeman *et al.*, 2002). Both theoretical and practical accounts of the process of using the TPB to develop and evaluate an intervention are rare (Ajzen, undated; Hardeman *et al.*, 2002; Sutton, 2002). This study helps to address this gap by providing an account of the process adopted in the Foolsspeed campaign. Time constraints did not allow baseline TPB data to be analysed before the start of the campaign in order

Table IV. Attitude to the behaviour: comparison of baseline and second survey (base: all matching between baseline and second survey)

Attitude i = instrumental belief i × outcome evaluation i [Very unlikely (−3)/Very likely (+3) × Very undesirable (−3)/Very desirable (+3)]	Mean	SD	Paired differences
(i) Causing danger to pedestrians	−3.52/− 3.21	5.17/ 4.80	$t = -1.106$, d.f. = 385, NS
(ii) Finding it difficult to stop quickly in an emergency	−2.68/− 3.71	5.55/ 5.04	$t = 3.236$, d.f. = 385, $P < 0.01$
(iii) Causing an accident	−1.31/− 1.74	5.16/ 5.14	$t = 1.587$, d.f. = 382, NS
(iv) Getting caught for speeding	−1.26/− 1.67	5.29/ 5.45	$t = 1.372$, d.f. = 384, NS
(v) Being able to keep up with the flow of traffic	1.15/ 1.14	3.27/ 2.63	$t = 0.043$, d.f. = 383, NS
(vi) Getting to your destination quicker	0.50/ 0.61	3.26/ 3.04	$t = -0.560$, d.f. = 384, NS
(vii) Driving at what you feel is a comfortable speed	−0.05/− 0.65	4.33/ 4.26	$t = 2.535$, d.f. = 384, $P < 0.05$
(viii) Saving time	0.88/ 0.82	3.14/ 2.96	$t = 0.306$, d.f. = 384, NS
Composite attitude score			
baseline/second survey	−6.25/− 8.21	18.92/ 19.33	$t = 2.050$, d.f. = 373, $P < 0.05$
baseline/third survey	−5.57/− 7.69	19.62/ 18.86	$t = 2.156$, d.f. = 353, $P < 0.05$
baseline/fourth survey	−6.73/− 6.82	19.62/ 18.02	$t = 0.071$, d.f. = 277, NS

Items (i) to (viii): mean scores and SD in normal type = baseline; mean scores and SD in bold type = second survey.

to identify key determinants and beliefs to target in the advertising. However, the process which was adopted—consultation of existing TPB literature on speeding to identify key salient beliefs and predictors of speeding, plus formative consumer research to provide guidance on campaign tone and style—represented a useful real-world compromise.

The study demonstrates that it is possible to design behaviour change advertising which is both underpinned by rigorous theory *and* which works in communication terms. Too many health mass media campaigns lack a sound theoretical basis guiding their formulation of objectives and messages (Maibach and Parrott, 1995; Witte, 1997). The Foolsspeed evaluation demonstrates that it is possible to design advertising which is explicitly underpinned by proven theoretical constructs.

Equally, an appropriate theory base is insufficient if the advertising is not, first of all, capable of standing out in a cluttered commercial advertising environment and of triggering desired cognitive and emotional responses (TAC, 2002). Careful pre-testing of each Foolsspeed ad increased the likelihood that the ads would be memorable and engaging, and this was borne out by the evaluation data: the ads were remembered, understood and largely enjoyed; triggered feelings of identification and empathy; and encouraged drivers to reflect on

and feel dissonance about their own driving. Because most drivers assume they are better than average, there is a tendency to discount road safety advertising as aimed at ‘other drivers worse than me’ (Walton and McKeown, 2001). Driver behaviour campaigns need to cut through this attitudinal bias. Encouragingly, with Foolsspeed, it was drivers who were most in need of the campaign’s messages—frequent speeders—who identified most strongly with the ads and were most strongly challenged by them to reassess their own driving behaviour.

The study also demonstrates the value of using TPB to understand and change driving behaviour. Anti-speeding advertising explicitly underpinned by the TPB was moderately effective in changing some of the psychological determinants of speeding. We found desired changes over the campaign period in Attitude to the behaviour and its associated constructs, Positive and Negative Affective Beliefs, and nearly all of these changes were significantly associated with awareness of the Attitude ad. In other words the Foolsspeed ad designed to challenge drivers’ attitudes towards speeding did indeed influence beliefs about both the instrumental consequences of speeding and its emotional benefits and drawbacks.

Less encouragingly, there was no evidence that the campaign effected substantial changes in

Subjective Norms or PBC, or in behavioural intentions and reported behaviour. A number of explanations are possible. One is that the Attitude ad may have been conceptually stronger and more persuasive than the other two ads, with the result that it influenced its targeted TPB component while they did not. The Attitude ad was also the earliest of the three ads to be screened, so may have benefited from cumulative exposure effects (it was repeated each subsequent year of the campaign). Another explanation may be that Subjective Norms and PBC are less susceptible to change, by communications means alone, than Attitude because they comprise external as well as internal dimensions (Manstead, 1991; Conner and Sparks, 1995).

The results must also be read in light of the study's methodological limitations. A 4-year cohort study will be affected by attrition and the possibility that remaining respondents became sensitized or 'contaminated' cannot be ruled out. The fact that reported speeding behaviour apparently reduced significantly over the course of the study may indicate an increasing tendency to give socially desirable responses. Related to this point, reported frequency of speeding represents a weak behaviour measure. Actual speeding behaviour as tracked using speeding cameras and numbers of fines issued would have represented a far stronger measure of the campaign's impact on real behaviour, although this was beyond the capacity of the study.

Overall, the study highlights a number of implications both for future TPB research and for the design of effective driver behaviour interventions. Firstly, in terms of TPB research, the study adds to the evidence base concerning the TPB's ability to explain driving behaviour. The TPB as operationalized in this study was able to predict similar proportions of variance in speeding behaviour to those found in other applications of the TPB to speeding [e.g. (Parker *et al.*, 1992; Stradling and Parker, 1996)]. The predictive strength of the TPB remained consistent when measured cross-sectionally, at four separate survey stages; furthermore, the model was able to predict a moderate amount of variance in speeding intentions and behaviour four years later. Few studies have examined the TPB's

performance longitudinally; this study suggests that its predictive strength remains consistent and robust over time.

Second, the study suggests that further investigation is needed into 'Affective Beliefs' as an extension to the TPB. Although none of the Foolsspeed ads were specifically designed to address Affective Beliefs, significant changes in these beliefs were associated with seeing the Attitude ad, which suggests that it tapped into and challenged beliefs about the emotional benefits and drawbacks of speeding. The interaction between Affective Beliefs and Attitude within the TPB merits further study.

Third, in intervention terms, the study demonstrates that it is possible to design consumer- and theory-based road safety advertising campaigns, and provides a model for doing so. It suggests that TPB interventions may have more success in changing attitudes than other determinants of intentions and behaviour, and that Affective Beliefs may be a particularly fruitful focus for intervention. Finally, the study adds to the emerging evidence that low-key empathetic and credible road safety advertising can perform as well as highly emotional graphic depictions of accidents (Donovan *et al.*, 1999). It demonstrates that it is not necessary to use hard-hitting imagery and messages in order to engage drivers' attention and challenge their attitudes.

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