Predicting intentions not to “drink and drive” using an extended version of the theory of planned behaviour

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**Abstract**

The aim of this study was to determine to what extent the theory of planned behaviour (TPB) extended with moral norm and descriptive norm is able to predict intentions not to drink and drive. We also wanted to examine whether different processes guide intentions among young drivers (35 years and below) versus drivers aged above 35 years, and women’s versus men’s intentions. Questionnaires were sent to a sample of 4000 people in Norway aged between 18 and 70 years, and were completed by 1025 respondents. Analyses were conducted among those who had a driver’s licence and who reported drinking at least 1–2 times per year, resulting in a sample of 879 individuals (46.6% were men, 30.3% were 35 years and younger, M = 43.9 years). The results showed that the TPB variables explained 10% of the variance in intentions in the sample as a whole, and that the extension variables added 2% to the explained variance after controlling for the impact of the TPB components. Perceived behavioural control was the strongest predictor of intentions (β = 0.24, p < 0.001), followed by descriptive norm (β = −0.12, p < 0.001), attitude (β = 0.09, p < 0.01) and moral norm (β = 0.08, p < 0.05). Several group differences were found. The extended TPB model explained 16% and 5% of men’s and women’s intentions, respectively, and 26% and 9% of the variance in intentions among young and older drivers, respectively. The practical implications of these results for the development of interventions to encourage drivers not to drink and drive will be outlined.

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1. Introduction

Annually, 250 people are killed and 12,000 people are injured in road traffic in Norway. Half of those being killed are car drivers and the rest are passengers, pedestrians and bicyclists (Christophersen, 2008). According to the World Health Organization (WHO, 2004) 90% of road traffic accidents are caused by human factors, e.g., high speed, lack of driver experience, sleepiness, use of mobile phones, alcohol and drug use. Studies have shown that between 21% and 39% of Norwegian drivers that are involved in fatal traffic accidents were influenced by alcohol, and that intoxication of either alcohol and/or drugs was an important cause of road accidents (Brevig et al., 2004; Gjerde et al., 1993). A comparative study of five Nordic countries (Norway, Sweden, Finland, Denmark and Iceland) showed that alcohol and/or other drugs contributed to approximately 2/3 of single vehicle road accidents in Norway, Sweden and Finland (Christophersen et al., 2005). It is thus a well-established fact that the consumption of alcohol before driving a motor vehicle increases the accident risk.

Deterrence and enforcement are important measures for reducing the incidence of traffic violations. In relation to drink-driving, lowering the legal limit for blood alcohol concentration (BAC) is regarded as one of the most effective strategies to prevent alcohol related road accidents (cf. Elvik and Vaa, 2003). Most countries have a BAC limit of 0.02 (i.e., 20 mg alcohol per 100 ml blood), 0.05 or 0.08%. Norway was the first country in the world to introduce a legal BAC limit of 0.05% in 1936, and thus has a long tradition of strict enforcement. After Sweden reduced the legal BAC limit from 0.05 to 0.02% in 1990, the pressure increased for a similar reduction in Norway, and the amendment came into effect by January 1, 2001. Nonetheless, the number of arrests due to a suspicion of alcohol use has been relatively stable since 1995, i.e., approximately 5000–5500 per year. A large proportion of the arrested drivers are men, and the largest group consist of drivers aged 35 years and below (Christophersen, 2008).

The majority of Norwegian license holders consider driving with a BAC above the legal limit reprehensible (Vaas and Elvik, 1992). Nevertheless, as demonstrated above, a relatively large fraction of road accidents are caused by alcohol use. This inconsistency between attitudes and behaviour indicates that factors besides atti-
tudes might influence car drivers’ road behaviour. Hence, if the psychological mechanisms which motivate car drivers not to drink and drive can be identified, then there is the potential to develop interventions which may lead to changes in behaviour (Stead et al., 2005).

Social psychologists have mainly been developing integrated attitude–behaviour models, including additional predictors of behaviour such as social norms or intentions (Olson and Zanna, 1993). Typically, such models focus on the motivational factors underlying individuals’ decisions to perform (or not perform) behaviours, and hence these models have been referred to as motivational models (cf. Armitage and Conner, 2000). The most well-known motivational model is perhaps the theory of planned behaviour (TPB; Ajzen, 1991). The TPB also provides a basis for practical interventions along with models such as the Health Belief Model (HBM; Janz and Becker, 1984) and Protection Motivation Theory (PMT; Rogers, 1983) (see Fylan et al., 2006, for an evaluation of the practicality of the models). However, in terms of predictive utility, the TPB provides an improvement on the HBM and PMT. This finding is based on studies that have directly compared the models, and which have found the TPB to be the superior in the prediction of intentions and behaviour (e.g., Armitage and Conner, 2000; Quine et al., 1998).

1.1. The theory of planned behaviour

According to the TPB the proximal determinant of behaviour is the intention to engage in a particular behaviour. Behavioural intentions are assumed to “…capture the motivational factors that influence a behaviour, they are indicators of how hard people are willing to try, of how much effort they are planning to exert, in order to perform the behaviour.” (Ajzen, 1991, p. 181). They are also assumed to be a function of an (i) individual’s attitude towards the specific behaviour, i.e., a positive or negative evaluation of the behaviour, (ii) subjective norms which refer to an individual’s perception that important others in his or her social environment wish or expect him or her to behave in a certain way, and (iii) the perceived behavioural control (PBC) over the behaviour. PBC is defined as the person’s own perception of how easy or difficult it is to execute the behaviour.

Armitage and Conner (2001) reported in a meta-analysis of 185 studies that the TPB accounted for 39% of the variance in intentions. Attitude was the strongest predictor of intention across studies, followed by PBC and subjective norms. The TPB has also been applied to predict a range of risky road behaviours, e.g., speeding (Conner et al., 2003; Parker et al., 1992a,b; Stead et al., 2005), wearing a safety helmet (Quine et al., 1998), and road-crossing in risky situations (Diaz, 2002; Evans and Norman, 2003).

Moan and Ulleberg (in preparation) conducted a meta-analysis of 23 studies that have applied the TPB to predict risky road behaviours. The TPB variables explained 36% of the variance in intentions and 42% of the variance in behaviour, respectively. In terms of Cohen’s (1988) classification of effect sizes, where small, medium and large effects equals 1%, 9% and 25% in terms of explained variance ($R^2$), meta-analyses show that the variance explained by the TPB in intention and behaviour resembles large effect sizes (cf. Armitage and Conner, 2001; Moan and Ulleberg, in preparation; Sheeran, 2002).

In the context of drunk driving, we were able to identify five studies which have applied the TPB to predict intentions to drive while intoxicated by alcohol (cf. Armitage et al., 2002; Chan et al., 2010; Marci et al., 2001; Parker et al., 1992a,b), all of which showed that the TPB successfully predicted intentions ($R^2 = 42–79$%). The TPB should thus form a good starting-point for studying intentions not to drink and drive.

However, the results in the study of Moan and Ulleberg (in preparation) showed that the TPB components explained a somewhat smaller amount of the variance in intentions compared to the results reported by Armitage and Conner (2001). Moreover, Moan and Ulleberg (in preparation) found that PBC was the strongest predictor of intention, followed by subjective norm and attitude. The above results illustrate that the impact of the TPB components might differ across behavioural domains. This is in accordance with the assumptions of Ajzen (1991). He stated that the effect of the TPB components is expected to differ across populations, behaviours and situations. Thus, in light of the fact that most drivers who are arrested due to a suspicion of alcohol impairment are men, and that the largest group consist of drivers aged between 20 and 35 years (cf. Christophersen, 2008), it is important to examine gender differences as well as age differences when studying a topic such as drink-driving.

The TPB is held to be a complete theory of behaviour, i.e., demographic variables, past behaviour and personality traits are assumed to have impact on behaviour via influencing components of the model (Ajzen, 1991). Nevertheless, Ajzen (1991) described the model as open to further elaboration if further important determinants are identified. O’Keefe (2002) stated that two criteria should be used to evaluate additional predictors in the TPB. First, a given conceptual candidate should provide a large additional contribution to the prediction of intention which reaches well beyond statistical significance. Second, the constructs should demonstrate its utility across a wide range of behavioural domains. A number of variables have been shown to be useful additions to the TPB, and descriptive norm and moral norm are some of the most consistent additional predictors both in terms of additional variance explained in intentions and in terms of predictive utility across behavioural domains (cf. Conner and Armitage, 1998; O’Keefe, 2002). However, no study has previously examined the relative impact of these variables and the variables of the TPB in relation to intentions not to drink and drive.

1.2. Extending the TPB

Studies employing the TPB generally reveal that subjective norm is the weakest predictor of behavioural intentions (cf. Armitage and Conner, 2001). Armitage and Conner (2001) found that the number of items used to measure subjective norm significantly moderated the subjective norm–intentions correlations, i.e., multiple items resulted in stronger correlations across tests than single-item measures. However, nearly half of the studies which have applied the TPB to study intentions in the context of risky road behaviours found subjective norms to be the weakest predictor, even when multiple items was used to assess subjective norm (cf. Moan and Ulleberg, in preparation). Thus, another explanation of the weak impact of subjective norm is that the definition of the construct is too narrow to capture all aspects of social influence (cf. Conner and Armitage, 1998; Terry et al., 1999).

According to Cialdini et al. (1990) normative influences may stem from a variety of sources, and they suggest that it may be useful to distinguish between injunctive norm (akin to subjective norm) as they concern the social approval or disapproval of others, descriptive norm, which is concerned with what others are doing, and moral norm, which concern what is right or wrong to do. Ajzen (2002) recognized that since important others generally are perceived to approve of desirable behaviours and disapprove of undesirable behaviours, subjective norm is often found to have low variability. Thus, to alleviate this problem, he recommended that the measure of subjective norm also should include items designed to capture descriptive norm.

Descriptive norm reflect what is perceived as common or normal, i.e., what most people do. Rivis and Sheeran (2004) found
in a meta-analysis that descriptive norm increased the variance explained in intention by 5 per cent after the TPB components had been taken into account (i.e., an improvement representing a small-to-medium effect size). Moreover, younger samples and health and risk behaviours were both associated with stronger correlations between descriptive norms and intentions. No previous study seems to have examined the impact of descriptive norm in relation to risky road behaviours such as drink-driving. However, in the light of the results of Rivis and Sheeran (2004) it is expected that descriptive norm will have an impact on intentions not to drink and drive, beyond the impact accounted for by the TPB components, and particularly among young drivers.

Moral norm represent the conviction that some forms of behaviours are inherently right or wrong, regardless of their personal or social consequences (Ajzen, 1991). In a review of TPB components it was shown that moral norm on average explained 4% of the variance in intention, beyond the impact of the TPB components (cf. Conner and Armitage, 1998). Parker et al. (1995) found that moral norm exerted a significant impact on intentions to perform a number of risky road behaviours (i.e., cutting across traffic, reckless weaving, and to overtake on the inside), beyond the impact of the TPB components. Particularly moral considerations should have an influence on the performance of those behaviours with a moral or ethical dimension, e.g., like drink-driving (Beck and Ajzen, 1997; Berger and Marellic, 1997). However, we were not able to identify any studies which have examined the influence of moral norm, beyond the impact of the TPB components, in the context of drink-driving.

The aim of this study was threefold: (i) to determine to what extent the TPB is able to predict intentions not to drink and drive, (ii) to determine whether descriptive norm and moral norm could predict intentions, after accounting for the impact of the TPB components, and (iii) to examine whether different processes influence the motivation of women and men, and drivers aged 35 years and below versus drivers above 35 years.

2. Method

2.1. Procedure and respondents

Questionnaires were sent via traditional mail to 4000 randomly drawn persons from the national register in Norway aged between 18 and 70 years in November 2007, and were completed and returned in a pre-addressed envelope by 1025 respondents. The data collection was conducted by Norfakta Markedsanalyse AS (http://www.norfakta.com/). We had no possibility of comparing those who completed the questionnaire with those who did not complete the questionnaire with regards to demographic variables such as gender and age.

Analyses were conducted among those who had a driver’s licence and who reported drinking alcohol at least 1–2 times per year, resulting in a sample of 879 individuals. There were 410 (46.6%) men in the sample (33.9% were men among those without a driver’s licence), and 266 (30.3%) were 35 years and younger. The average age was 43.9 years (SD = 13.5 years) as opposed to an average age of 40.08 years among those without a driver’s licence.

2.2. Measures

2.2.1. The components of the theory of planned behaviour

The questionnaire first introduced a scenario for a potential drinking and driving situation. The participants (with a driver’s licence) had to think of (imagine) themselves driving to a pub, restaurant, dinner party or another place outside the house where alcohol is being consumed. Moreover, they were asked to imagine themselves recently drinking 2 bottles of beer (0.7l), and then to consider whether or not to drive away from the place in 1 h. This particular amount was chosen because we wanted the participants to be uncertain whether or not their BAC exceeded the legal limit. Keeping this scenario in mind, the participants completed the questionnaire. In the following paragraphs, each scale of the questionnaire is described with a measure of its internal consistency (Cronbach’s alphas, and Pearson’s r’s in instances where 2 items were used). All scales were ranged from 1 to 7, except from the attitude-scale which was ranged from −3 to +3.

**Attitude** was assessed using 5 items with the stem “To drive from a party in such a situation during the next 12 months, would for me be....”: Wrong–Right, Foolish–Wise, Unpleasant–Pleasant, Unnecessary–Necessary, Punishing–Rewarding. Alpha (α) = 0.86.

**Subjective norm** was assessed using 2 items: (1) people that mean a lot to me, thinks that I should avoid driving in situations like that during the next 12 months, Completely disagree–Completely agree, (2) People that mean a lot to me, thinks it is okay that I drive in situations like that during the next 12 months, Completely disagree–Completely agree. The last item was reversed before computing the index (r = 0.70).

**Perceived behavioural control** was assessed using 3 items: (1) During the next 12 months I can easily avoid driving in situations like that, if I want to, Very unlikely–Very likely, (2) During the next 12 months it is likely that I can avoid driving in such situations, if I try, Very unlikely–Very likely, (3) Not to drive in such situations during the next 12 months, will for me be, Very difficult–Very easy (α = 0.73).

**Intention** was assessed using 4 items using the stem: “During the next 12 months...” (1) I intend to avoid driving a car in such situations, (2) I will try avoiding driving a car in such situations, (3) I plan not to drive a car in such situations, and (4) I will not drive a car in such situations, Very unlikely–Very likely (α = 0.78).

2.2.2. Extension variables

**Descriptive norm** was assessed using 2 items: (1) Think about your friends, how many would drive in a situation described above? None of them–All of them, (2) Think about your friends, to what extent would they agree that one should avoid driving in a situation like that? To a small extent–To a large extent (r = 0.72).

**Moral norm** was assessed using 3 items: (1) To drive a car in such situations during the next 12 months is morally wrong, (2) I would feel guilty if I drive in situations like that during the next 12 months, (3) I would get a bad conscience if I drive a car in such situations during the next 12 months, Completely disagree–Completely agree (α = 0.91). The above results showed that Cronbach’s alpha was generally higher than 0.70, indicating a satisfactory level of internal consistency (cf., Nunnally, 1978).

3. Results

3.1. Descriptive statistics and correlations

The correlations among the variables as well as the descriptive statistics of the variables are presented in Table 1. The results show that all independent variables were significantly correlated with behavioural intentions. PBC exerted the strongest impact on intentions (r = 0.29, p < 0.001), followed by descriptive norm (r = −0.18, p < 0.001) and moral norm (r = 0.16, p < 0.001). The correlation between descriptive norm and intention was negative because intention was worded as follows “intention not to drink and drive” while descriptive norm was worded as follows “Think about your friends, how many would drive in...”
Table 1
Correlations and descriptive statistics (N=879).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>Attitude (1)</td>
<td>–</td>
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<td></td>
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<td>Subjective norm (2)</td>
<td>0.15***</td>
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<td>Perceived behavioural control (3)</td>
<td>0.08*</td>
<td>0.33***</td>
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<td></td>
</tr>
<tr>
<td>Moral norm (4)</td>
<td>0.32***</td>
<td>0.24***</td>
<td>0.22***</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Descriptive norm (5)</td>
<td>–0.05</td>
<td>–0.12***</td>
<td>–0.23***</td>
<td>–0.08*</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Intention (6)</td>
<td>0.13***</td>
<td>0.14***</td>
<td>0.29***</td>
<td>0.16***</td>
<td>–0.18***</td>
<td>–</td>
</tr>
<tr>
<td>M</td>
<td>1.22</td>
<td>6.64</td>
<td>6.73</td>
<td>6.52</td>
<td>4.08</td>
<td>6.65</td>
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<tr>
<td>SD</td>
<td>0.63</td>
<td>1.04</td>
<td>0.88</td>
<td>1.15</td>
<td>0.96</td>
<td>0.99</td>
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</tbody>
</table>

***p < 0.001, *p < 0.05 (two-tailed)

Table 2
Predicting intentions using an extended version of the theory of planned behaviour (N=879).

<table>
<thead>
<tr>
<th>Step</th>
<th>Predictors</th>
<th>(\beta) Step 1</th>
<th>(\beta) Step 2</th>
<th>(R^2)</th>
<th>(F_{change})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Attitude</td>
<td>0.10**</td>
<td>0.09**</td>
<td>0.05</td>
<td>31.11***</td>
</tr>
<tr>
<td></td>
<td>Subjective norm</td>
<td>0.04</td>
<td>0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perceived behavioural control</td>
<td>0.27***</td>
<td>0.24***</td>
<td>0.10</td>
<td>31.11***</td>
</tr>
<tr>
<td></td>
<td>Moral norm</td>
<td>0.08*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Descriptive norm</td>
<td>–0.12***</td>
<td>0.12</td>
<td>0.12</td>
<td>8.4***</td>
</tr>
</tbody>
</table>

Table 3
Predicting intentions for women (N=469) and men (N=410) using an extended TPB model.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(\beta)</td>
<td>SE</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Perceived behavioural control</td>
<td>0.22***</td>
<td>0.27</td>
</tr>
<tr>
<td>Moral norm</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Descriptive norm</td>
<td>–0.02</td>
<td>–0.02</td>
</tr>
<tr>
<td>(R^2) (Step 1)</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>(R^2) (Step 2)</td>
<td>0.05</td>
<td></td>
</tr>
</tbody>
</table>

Note: only coefficients from Step 2 are presented in the table. Only the TPB components were entered in Step 1.

\(p < 0.05\)
\(**p < 0.01\)
\(***p < 0.001\)

3.2. Predicting intentions using an extended TPB model

A hierarchical regression analysis was used to predict intentions among all respondents, entering the TPB components in Step 1 and the extension variables in Step 2. The results are presented in Table 2.

The results showed that the TPB components accounted for 10% of the variance in intentions. PBC exerted the strongest impact on intentions (\(\beta = 0.27, p < 0.001\)), followed by attitude (\(\beta = 0.10, p < 0.01\)). The impact of subjective norm was not significant. The results from Step 2 showed that the extension variables added 2% to the explained variance in intention, beyond the impact of the TPB components. Both moral norm (\(\beta = 0.08, p < 0.05\)) and descriptive norm (\(\beta = –0.12, p < 0.001\)) had a significant impact on intentions after controlling for the impact of the variables in the TPB.

3.3. Predicting intentions for women and men

Two separate regression analyses were conducted to examine whether different mechanisms motivated men and women not to drink and drive. The results are presented in Table 3.

In Table 3 it can be seen that the TPB components explained 5% and 13% of the variance in intentions among women and men, respectively. PBC was the strongest predictor of intentions for both genders (\(\beta = 21, p < 0.001\) for men and \(\beta = 22, p < 0.001\), for women). Attitude and subjective norm were not significantly related to intentions among women. Attitude exerted a significant impact on intentions among men (\(\beta = 15, p < 0.01\)), while the impact of subjective norm was not significant. The extension variables had no significant impact beyond the TPB components among women. However, among men the impact of descriptive norm was significant (\(\beta = –0.18, p < 0.001\)). The extended TPB model explained 5% and 16% of the variance in intention among women and men, respectively. To test the potential moderating effect of gender, we compared the unstandardized beta coefficients for women and men as suggested by Baron and Kenny (1986). Two significant gender differences were found: descriptive norm and attitude were more strongly related to intentions among men than among women.

3.4. Predicting intentions for those aged 35 and below and for those above 35 years of age

Finally, two separate regression analyses were conducted to predict intentions among those aged 35 and below and among those aged above 35 years. The results from the analyses are presented in Table 4.

The results presented in Table 4 shows that the TPB components accounted for 25% and 7% of the variance in intentions among...
the young drivers and among those aged above 35 years, respectively. Among the TPB components, only PBC exerted a significant impact on intentions among the young drivers ($\beta = 0.40$, $p < 0.001$), while both attitude ($\beta = 0.11$, $p < 0.01$) and PBC ($\beta = 0.20$, $p < 0.001$) had a significant impact on intentions among those aged above 35 years. Among those aged 35 years and below, neither moral norm nor descriptive norm had a significant impact on intentions. Among those aged above 35 years, descriptive norm had a significant impact on intentions ($\beta = -0.12$, $p < 0.01$), while moral norm did not. The extended TPB model accounted for 26% and 9% of the variance in intentions among the young and the older drivers, respectively. We compared the unstandardized beta coefficients for the two groups, revealing one significant age difference: PBC was more strongly related to intentions among the young drivers than among drivers aged above 35 years ($p < 0.05$).

4. Discussion

First, this study showed that the TPB components explained 10% of the variance in intentions in the sample as a whole, and that the model did benefit from being extended with moral norm and descriptive norm ($R^2 = 0.02$, $p < 0.001$). Second, the extended TPB model accounted for more of the variance in men's (0.16) as opposed to women's ($R^2 = 0.05$) intentions not to drink and drive. The predictive pattern was also different among women and men. While PBC was the only significant predictor of women's intentions, attitude, PBC and descriptive norm had a significant impact on intentions among men. Two of these differences were statistical significant, i.e., attitude and descriptive norm were more strongly related to intentions among men than among women. Third, the extended TPB model accounted for more of the variance in intentions among drivers aged 35 years and below ($R^2 = 0.26$) than among those above 35 years of age ($R^2 = 0.09$). While PBC was the only significant predictor of intentions among the young drivers, three variables exerted a significant impact on intentions among the older drivers: attitude, PBC and descriptive norm. By comparing the unstandardized beta coefficients we found that only the PBC–intention relation distinguished significantly between the two age groups, i.e., PBC was more strongly related to intentions among young drivers than drivers aged above 35 years.

4.1. Predicting intentions using an extended TPB model

As can be seen from the results of this study, the TPB did a poor job in accounting for the intentions not to drink and drive in the sample as a whole. The TPB components explained only 10% of the variance in intentions. This figure is considerably lower than the figure found in the meta-analysis of Armitage and Conner (2001), i.e., 39%, and in the meta-analysis conducted by Moan and Ulleberg (in preparation) where the TPB variables explained 36% of the variance in intentions.

However, the predictive pattern of the present study was similar to that of the meta-analysis of Moan and Ulleberg (in preparation) in that PBC turned out to be the strongest predictor of intentions. The meta-analysis of Armitage and Conner (2001), which contained studies from a broad range of behavioural domains, revealed that attitude was the strongest predictor of intention. No studies have previously applied the TPB to study intentions not to drink and drive, and the results from studies which have applied the TPB to predict intentions to drink and drive are not consistent. While Marcil et al. (2001) found attitude to be the strongest predictor of intentions, Parker et al. (1992a,b) found that PBC was the strongest predictor of intentions. However, the study of Marcil et al. (2001) was conducted among 115 male drivers aged between 18 and 24 years in Canada, and Parker et al. (1992a,b) conducted their study among a stratified sample of 800 drivers in England (50% women and men, aged between 17 and 55+ years).

Although moral and descriptive norm were significantly related to intentions, after controlling for the impact of the TPB components, the contribution was small in terms of explained variance, i.e., $R^2 = 0.02$, $p < 0.001$ (cf. Cohen, 1988). However, the results from this study showed that the predictive pattern of the TPB components differed across gender and across different age groups, a finding which is in accordance with the assumption of Ajzen (1991) that the impact of the TPB components is expected to differ across different populations. This study showed that PBC was significantly stronger related to intentions among the drivers aged 35 and below as opposed to the drivers aged above 35 years. Young adult Norwegians, i.e., those aged between 20 and 30 years, drink more alcohol than older individuals (Horverak and Bye, 2007). Thus, it is reasonable to argue that young individuals more often are exposed to the scenarios like the one used in the present study and thus more often will have to consider whether or not to drive after drinking a couple of beers. Moreover, since they are exposed to such situations more frequently than older drivers, they might also be tempted to drive in various situations more so than older drivers. In light of this, perceived behavioural control is obviously an important aspect to retain an intention not to drink and drive.

Moreover, the impact of descriptive norm, i.e., the perception of what is a common or normal thing to do (in this instance to drink and drive), were more strongly related to intentions among men than among women. Young men drive more often than young women, are more frequently arrested due to a suspicion of driving under the influence of alcohol, and they do more often drive under the influence of alcohol than women (cf. Christophersen, 2008). Thus, while drink-driving most likely is perceived as relatively uncommon among women it is reasonable to assume that it is perceived as more common among men.

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Table 4

<table>
<thead>
<tr>
<th>Predictors</th>
<th>35 years and below</th>
<th>Above 35 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$B$</td>
</tr>
<tr>
<td>Attitude</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Subjective norm</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Perceived behavioural control</td>
<td>0.40***</td>
<td>0.45</td>
</tr>
<tr>
<td>Moral norm</td>
<td>0.07</td>
<td>0.08</td>
</tr>
<tr>
<td>Descriptive norm</td>
<td>−0.11</td>
<td>−0.11</td>
</tr>
<tr>
<td>$R^2$(Step 1)</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>$R^2$(Step 2)</td>
<td>0.26</td>
<td></td>
</tr>
</tbody>
</table>

Note: only coefficients from Step 2 are presented in the table. Only the TPB components were entered in Step 1.

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

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4.2. Practical implications

Drink-driving in Norway is a violation mainly conducted by men aged 35 years and younger (Christophersen, 2008). The results from this study showed that the extended TPB model was better suited to predict intentions among men and those aged 35 years and younger than among women and drivers aged above 35 years. Thus, the results may have some practical implications for the most important target group in this context (young male drivers). Particularly, the results indicate that future interventions should attempt to increase the control perceptions of young drivers. Perceived behavioural control was the most consistent predictor of intentions in this study, across age and gender, but it was a particularly strong predictor of young driver’s intentions not to drink and drive. Bandura (1986) outline three ways in which perceptions of control over a behaviour (or self-efficacy) can be enhanced: through personal mastery experience by setting and achieving sub-goals (avoiding situations where drink-driving would be an option, e.g., by taking the bus or a taxi to the destination of interest), through observing other’s who decide not to drink and drive (e.g., modelling familiar personalities who clearly state that they will not drink and drive), and through standard persuasive techniques. Attitude was a stronger predictor of intentions among men than among women and hence focusing on the consequences of driving while intoxicated seem to be a more effective strategy in preventing men from drink-driving than women. Finally, descriptive norm was more strongly related to intentions among men than women. Thus, if men perceive that it is normal or common among their friends to drink two bottles of beer before driving, they are more likely to intend doing so themselves. It is thus important to inform male drivers that the majority of the male population do not drink before driving.

4.3. Methodological considerations

A number of potential methodological problems with the present study should be noted. First, the fact that we do not have data on subsequent behavioural performance is of course a weakness in the present study. Nevertheless, since the particular behaviour, drink-driving, has received scant research attention in within the framework of the TPB, this specific behaviour deserved more research attention. Given the importance of drink-driving as an important threat to public health, this study have provided useful information about the motivational processes underlying the decisions of drivers not to drink and drive. However, intentions have been found to correlate strongly with behaviour across a wide variety of behavioural domains. In a meta-analysis of meta-analyses of the intention–behaviour relationship Sheeran (2002) reported an average correlation of 0.53. It should also be mentioned that measuring subsequent behaviour in this context (scenario of potential drink-driving) would represent a large challenge. Second, although the respondents were randomly drawn from the national register in Norway, the response rate was low and hence it is uncertain whether this sample can be regarded as representative of the population of drivers in Norway. Third, the study relied on self-report measures. However, results from a meta-analysis (Armitage and Conner, 2001) showed that the TPB account for a relatively large amount of the variance both of observed ($R^2 = 0.20$) and self-reported behaviour ($R^2 = 0.31$). A fourth potential threat to the reliability and validity of the TPB measures is social desirability. Sheeran and Orbell (1996) found some effect of social desirability on the reliability of the measures, and the correlations between the components in the protection motivation theory, while Beck and Ajzen (1991) and Armitage and Conner (1999b) could not confirm this finding in their studies of dishonest behaviour and food choice.

Armitage and Conner (1999b) therefore suggested that Sheeran and Orbell’s (1996) findings were artificial. In conclusion self-reports by means of questionnaires cannot be viewed as a neutral method for data collection, but neither can experiments nor any other psychological method (see Cook and Campbell, 1979).

5. Conclusions

The results from this study showed that the extended TPB model accounted for a small amount of the variance in intentions in the sample as a whole. However, the model was better suited to predict intentions not to drink and drive among men and drivers aged 35 years and younger than women and drivers aged above 35 years. Perceived behavioural control was the most consistent predictor of intentions across age and gender, but was a particularly strong predictor of intentions among young drivers. After PBC, descriptive norm was the most important predictor of intentions among young male drivers. Since male drivers aged 35 years and below represent the most important target group in the context of drink-driving, the results from this study indicate that future interventions should target PBC and descriptive norm.

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References


