

# Motorists' perceptions of factors that influence payment of speeding fines in Cape Town, South Africa: application of the Theory of Planned Behaviour

Jason Bantjes<sup>1</sup> , Sophia du Plessis<sup>2</sup>, Ada Jansen<sup>2</sup>, Krige Siebrits<sup>2</sup> and Philip Slabbert<sup>1</sup>

## Abstract

Despite the aggressive enforcement of speed limits, speeding remains the second leading cause of fatalities in vehicle accidents in South Africa. Speeding fines are one mechanism for enforcing speed limits; however, these are only effective deterrents against speeding if fines are enforced. The potential effectiveness of speeding fines to increase safety on South African roads is rendered almost obsolete because so many offenders default on payment. Our aim was to utilise the Theory of Planned Behaviour as a framework to explore motorists' perceptions of factors that may influence the payment of speeding fines in Cape Town, South Africa. Self-report data were collected from participants who had received fines ( $n=268$ ), about their speed fine-paying behaviour, their perceptions of the consequences of non-payment, subjective and social norms, and control beliefs about the ease with which fines can be paid and motorists' ability to afford fines. Regression analysis showed that motorists who report paying their fines are more likely than those who do not pay to hold beliefs that non-payment will result in serious consequences, affirm injunctive norms supporting the payment of fines, believe that it is easy to pay fines, and are able to afford to pay. This study provides novel insights into the potential of theories of behaviour change to design evidence-based behavioural interventions to encourage motorists to comply with speeding fines and hence to improve road safety in South Africa.

## Keywords

road safety, South Africa, speeding, Theory of Planned Behaviour, traffic fines

<sup>1</sup>Institute for Life Course Health Research, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, South Africa

<sup>2</sup>Department of Economics, Faculty of Economic and Management Sciences, Stellenbosch University, South Africa

## Corresponding author:

Jason Bantjes, Institute for Life Course Health Research, Department of Global Health, Faculty of Medicine and Health Sciences, Stellenbosch University, Private Bag XI, Matieland, Stellenbosch 7602, South Africa.

Email: [jbantjes@sun.ac.za](mailto:jbantjes@sun.ac.za)

Death and injury from traffic accidents are serious public health problems internationally and in South Africa (SA) (Fylan & Stradling, 2014). Road accidents are the third most common cause of non-natural deaths in SA (StatsSA, 2019a). In 2015, there were 832,431 road accidents; 11,144 fatal crashes resulting in the loss of 13,591 lives and 40,117 major accidents resulting in serious injury to 62,520 people (Road Traffic Management Corporation [RTMC], 2016a). Apart from the human cost, there are also economic costs associated with traffic accidents. In 2015, the cost of traffic accidents in SA was R142.95 billion, equivalent to 3.4% of the gross domestic product (GDP) (RTMC, 2016a). By international standards, SA has poor road safety outcomes, despite its comprehensive set of traffic laws (Du Plessis et al., 2019). It is estimated that 73.6% of all accidents are due to human factors, the most prevalent causes being pedestrian jaywalking (42.6%), speeding (16.3%), overtaking into oncoming traffic (8.9%), and hit-and-run accidents (8.4%) (RTMC, 2016b). Despite the aggressive enforcement of speed limits, speeding remains the second leading cause of fatalities in vehicle accidents (RTMC, 2015). Speed plays a pivotal role in fatal car crashes, as the impact of the crash is proportional to the speed of the vehicle (RTMC, 2016a). Speeding accounts for 9.2% of all fatal vehicle accidents and is the most frequently recorded infringement, accounting for 34.8% of traffic offences in 2015 (RTMC, 2016b). Speeding fines are one mechanism for enforcing speed limits; however, these are only effective deterrents if fines are enforced (Watson et al., 2015). If speeding fines are inconsequential, they no longer deter traffic violations (Zhao et al., 2019). The potential effectiveness of speeding fines to increase safety on SA roads is rendered almost obsolete because so many offenders default on payment, as evidenced by the fact that only 26% of fines issued between July 2014 and July 2016 in Cape Town had been settled by the beginning of September 2016 (Du Plessis et al., 2020). Relatively little research has been conducted within the field of psychology to understand motorists' fine-paying behaviours in SA, despite the potential of applying theories of behaviour change to promote road safety. Our aim in this study was to utilise the Theory of Planned Behaviour (TPB) as a framework to explore motorists' perceptions of factors that may influence the payment of speeding fines. This is an important first step towards planning psychologically informed behavioural interventions to increase compliance with fines.

Typically, the most important reference motorists use to choose a travelling speed is the average speed of other vehicles, and not the likelihood of receiving a fine (Zhao et al., 2019). Speeding fines are, however, an effective way to reduce the probability of transgression at an individual level, which results in a decrease in the average speed of road users and hence a decrease in the likelihood of subsequent speeding by other motorists (Zhao et al., 2019). If traffic laws are not enforced, the number of speeding infringements increases, making traffic fines an important mechanism to reduce speeding (da Silva et al., 2017; Ritchey & Nicholson-Crotty, 2011). Portable and fixed cameras make speeding one of the easiest traffic violations to detect (Du Plessis et al., 2020), but if traffic fines are not enforced, there is little point in detecting infringements. Enforcing speeding fines is integral to promoting road safety (Zhao et al., 2019); nonetheless, motorists' widespread disregard for fines in SA appears to be an obstacle to improving road safety (Du Plessis et al., 2020).

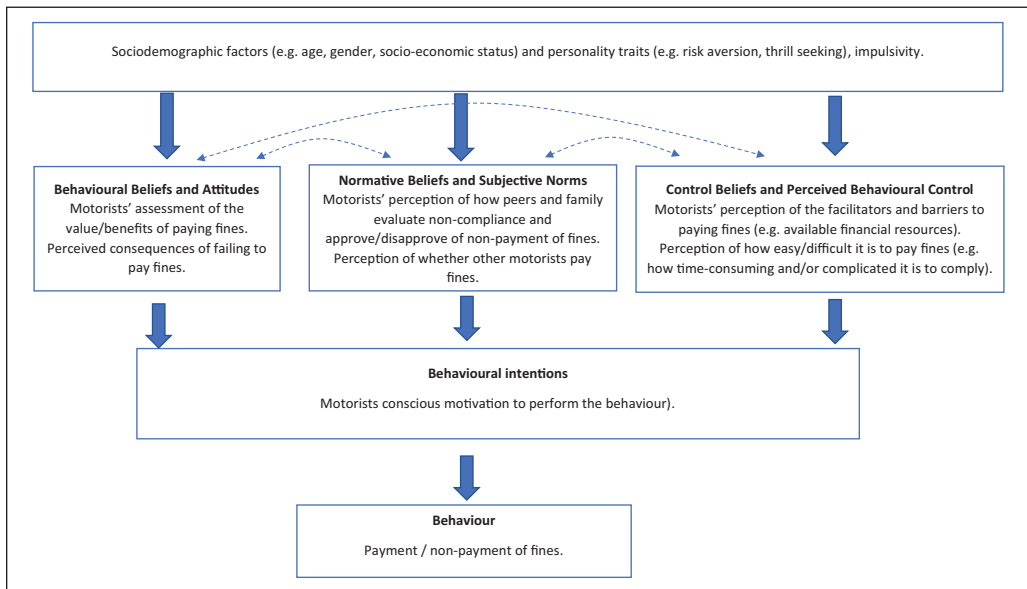
Comparatively little research has explored factors that influence motorists' fine-paying behaviours in SA; however, international data suggest that economic, legal, and sociocultural factors influence offenders' propensity to pay fines. The risk of motorists' defaulting on fine payments increases if fines are too high (Donnelly et al., 2016). Considering what people can afford to pay is important for establishing the appropriate value of fines (Jou et al., 2014); fines need to be high enough to deter speeding, but also reasonable to ensure that motorists can afford to pay, otherwise fines will simply be disregarded (Jou et al., 2014). Calculating this optimal rational fine amount is dependent on two variables: 'progressive income' and 'severity of the violation' (Jou et al., 2014). Taking account of a motorists' income to determine fines is also important for social justice (Jou et al., 2014), particularly in countries like SA which have marked income inequality. Indeed, unemployment is strongly associated with

non-payment of fines (Donnelly et al., 2016). Fines are fundamentally an inegalitarian penalty (Quilter & Hogg, 2018) since fines disproportionately impact economically disadvantaged individuals and defaulting on payment often reflects an inability rather than an unwillingness to pay. This is an important consideration in SA where the level of unemployment in 2019 was 29.1% of the working aged population and where more than half of the population live in poverty (StatsSA, 2019b). Furthermore, the likelihood of fine non-payment is a function of being young, male, knowing someone who got away with non-payment of a fine, having been recently fined, recidivism, and whether or not the infringement was detected by a camera (as opposed to a law enforcement officer) (Donnelly et al., 2016). Motorists' propensity to pay traffic fines is also influenced by their perception of social norms and the behaviour of other motorists; motorists are less likely to settle fines when they believe others default on payment without consequence (Donnelly et al., 2016).

Traditionally in SA, a court summons has been used to prompt defaulters to settle fines; however, this method of enforcement has overwhelmed the court system and is not sustainable, given the high number of defaulters and the limited capacity of courts (Government Gazette, 2019). More recently, the Administrative Adjudication of Road Traffic Offences (AARTO) Act (Act 4 of 2019) has been proposed to promote the payment of fines by discounting a fine's value for prompt payment and increasing the value of fines for late payment (Government Gazette, 2019). More severe sanctions, such as the inability to renew a driver's licence or vehicle licence until fines are settled, could also be an effective means of compelling compliance. Quasi-experimental studies have supported this assertion, suggesting that the prospect of driver's licence suspension may increase traffic fine settlement by up to 40% (Kessler, 2020), although the effectiveness of this strategy is significantly smaller in areas of higher poverty and may even be counterproductive in some settings (Quilter & Hogg, 2018). Licence suspension due to non-payment of fines has been associated with 'secondary offending', which occurs when defaulters have their licences suspended and are then further penalised because they are compelled to drive without a licence to access services and education (Quilter & Hogg, 2018). In situations where motorists need to drive to work, licence suspension simply results in secondary offences because individuals drive to stay employed. Licence suspension may thus be inappropriate in SA, since income inequality in the country makes such measures inequitable and extremely punitive for some motorists, especially given the absence of a reliable, affordable, and extensive public transport system. Media campaigns have also been used to encourage fine payment, but these have been relatively ineffective in changing behaviour (Du Plessis et al., 2020). 'Name and shame' lists have been used in some countries, for example, in Australia, to apply social pressure on motorists who do not pay fines, by posting the personal details of these individuals in the media, thus stigmatising individuals who default on fines (Quilter & Hogg, 2018).

An alternative to using punitive sanctions is to make use of psychologically informed behavioural interventions to promote fine payment. To this end, theories of behaviour change, such as the TPB, could provide useful frameworks for researching fine-paying behaviours and for planning interventions to improve compliance with traffic laws. The TPB, which evolved out of the Theory of Reasoned Action, is a model of behaviour change that intends to explain and predict behaviours that are under an individual's direct control (i.e., intentional behaviours) (Ajzen, 1985, 1991). The TPB has been used to guide public health interventions, including programmes aimed at smoking, alcohol consumption, health service utilisation, and condom use (Hardeman et al., 2002). According to the TPB (Ajzen, 1985, 1991), an individual's intention (i.e., conscious motivation to perform a behaviour) is a function of the following:

1. *Behavioural Beliefs and Attitudes* (i.e., an individual's assessment of the value of the behaviour and the perceived consequences of the behaviour).
2. *Normative Beliefs and Subjective Norms* (i.e., an individual's perception of how other people evaluate the behaviour, particularly whether peers and significant others approve/



**Figure 1.** Illustration of how the TBP might be applied to fine-paying behaviour.

disapprove, and an individual's perception of social expectations and cultural codes of behaviour).

3. *Control Beliefs and Perceived Behavioural Control* (i.e., an individual's perception of the facilitators/barriers to performing the behaviour, and an individual's perception of how easy/difficult it is to perform the behaviour).

Each of these constructs in turn is influenced by sociodemographic variables (e.g., age, gender, socio-economic status) and personality traits (e.g., risk aversion, thrill-seeking, impulsivity).

The TPB has been used in a range of road safety-related research, including studies of drunk driving (Moan & Rise, 2011), seat belt use (Şimşekoğlu & Lajunen, 2008), pedestrians' road crossing behaviour (Evans & Norman, 1998), and speeding (Stead, 2004). It has not, however, been extensively applied to understanding fine-paying behaviour. As illustrated in Figure 1, the TPB predicts that a motorist's propensity to pay fines is influenced by perception of the consequences of non-payment, perception of subjective and social norms about fine paying, and control beliefs about the ease with which fines can be paid and whether they can afford to pay. The aim of this research was to use the conceptual framework in Figure 1 to investigate motorists' perceptions of factors that influence their willingness to pay speeding fines. To the best of our knowledge, at the time of conducting this research, there were no published studies applying the TPB to fine payment in SA. This study thus addresses a gap in the SA literature and provides a first step towards applying psychological theory in this area of public health.

## Method

The aims of this cross-sectional quantitative survey were to (1) document motorists' perceptions of factors influencing speed fine-paying behaviour within the framework of the TPB and (2) establish if there are significant differences in the perceptions of motorists who report always paying their speeding fines versus those who report never or only sometimes paying.

## Participants

We recruited participants using convenience sampling in Cape Town, the inclusion criteria being that they must be SA citizens or permanent residents, hold a driver's licence, own a car, and conversant in English, Afrikaans, or isiXhosa.

## Instruments

Since there are no widely used locally validated survey instruments to assess attitudes to fine paying, we constructed a survey instrument based on constructs in the TPB. This survey instrument (available from the authors as Supplemental Material) was translated and back-translated from English to isiXhosa and Afrikaans, and assessed the following:

**Sociodemographic data:** Participants were asked their self-identified gender, age, highest level of education, home language, and employment status.

**Fine-paying behaviour:** Participants were asked if they had ever received a speeding fine and if so, how often they settled these fines (never, sometimes, always).

**Behavioural Beliefs and Attitudes:** Participants were asked to indicate their level of agreement with the following statements (on a five-point Likert-type scale): *Nothing would happen if I don't pay my speeding fines; I would pay my speeding fines if not doing so had serious consequences; and I would pay my speeding fines if I am not allowed to renew my driver's licence with outstanding fines against my name.*

**Normative Beliefs and Subjective Norms:** A five-point Likert-type scale was used to assess participants' level of agreement with the following statements: *Transgressors should always pay speeding fines; My family members and close friends believe that people should always pay speeding fines; My family members and close friends would be disappointed in me if I do not pay speeding fines; and Most motorists in SA pay speeding fines.*

**Control Beliefs and Perceived Behavioural Control:** Participants indicated their level of agreement with the following statements (on a five-point Likert-type scale): *It is time-consuming to pay speeding fines; It is complicated to pay speeding fines; I can afford to pay speeding fines; I would pay my speeding fines if a 50% discount is given for paying within 3 months; and I would pay my speeding fines if I knew that the fine would be doubled if I had not paid it within 3 months.*

Participants were also asked their perceptions of the institutional structures responsible for law enforcement, including their perception of law enforcement officers, the justness of speeding laws, and the legitimacy of the courts. These data are not included in this article and have been published elsewhere (Bantjes et al., 2021).

## Procedure

Potential participants were randomly approached, at four shopping malls in four peri-urban areas surrounding Cape Town (i.e., Bloubergstrand, Khayelitsha, Noordhoek, and Parow), and asked screening questions to ensure they meet inclusion criteria. In total, 400 participants were recruited, of which 268 reported that they had previously received speeding fines and completed all items of the survey. Surveys were conducted via an anonymous questionnaire, administered by trained data

collectors. Interviews lasted between 10 and 14 min, and participants' responses were manually recorded on survey forms and subsequently captured electronically.

### **Ethical considerations**

Ethical clearance was obtained from the Research Ethics Committee at Stellenbosch University (Reference number ECO-2019-10108). Participants gave written informed consent prior to data collection. Data were collected in a private space and anonymously stored in password-protected electronic files.

### **Data analysis**

Data were captured, cleaned, and checked before being analysed in STATA (statistical software for data science). Descriptive statistics were used to summarise the sample characteristics and responses. For the substantive analysis, we only considered the responses of participants who completed all items on the survey and reported that they had received a speeding fine (i.e., 268 of the 400 respondents). We explored associations between sociodemographic factors and fine-paying behaviour and beliefs, using *chi-square* tests for categorical variables and the *Mann-Whitney U test* for continuous variables. *Chi-square test* of response frequencies and bivariate logistic regression analyses were used to compare responses of participants who reported always paying their speeding fines with responses of those who reported never/sometimes paying their speeding fines. In the final step of the analysis, we used multivariate logistic regression analysis to identify the beliefs that were most strongly associated with paying fines. The results of all regression analyses are reported as odds ratios (ORs) with 95% confidence intervals (95% CIs). The level of significance was set at  $\alpha = .05$ .

## **Results**

### **Sample characteristics**

The survey was completed by 400 motorists living in 65 different suburbs with varying levels of socio-economic development in the Cape Town metropole. The sample consisted predominantly of self-identified males (76.2%), between the ages of 20 and 44 years (55.0%), with secondary school education (51.7%), were employed (64.2%), and spoke English (37.7%) or isiXhosa (37.2%). Of the 400 respondents, 68.0% had received speeding fines, of which 62.1% reported always paying fines, 25.7% reported sometimes paying, and 10.7% said they never pay. All subsequent results refer only to the analysis of responses by participants who completed all items on the survey and reported having received a speeding fine ( $N=268$ ).

### **Sociodemographic factors**

We explored associations between sociodemographic variables and fine payment (see Supplemental Materials). No associations were observed between fine paying and the following: age (OR = 1.01, 95% CI = [0.99, 1.03]), gender (OR = 0.64, 95% CI = [0.34, 1.22]), level of education (OR = 1.31, 95% CI = [0.79, 2.17]), or employment status (OR = 0.78, 95% CI = [0.46, 1.32]).

Given that in the TPB, sociodemographic factors are understood to influence attitudes and beliefs, we investigated associations between sociodemographic variables and each statement



in the survey (see Supplemental Materials). No significant differences were observed for gender, except that males were more inclined than females to endorse the belief 'My family members and close friends would be disappointed in me if I did not pay speeding fines' (54.5% vs. 74.2%, OR = 2.4,  $p = .004$ ). Age and employment status were not associated with any expressed beliefs. No associations were observed for the level of education, except participants with secondary school education were more likely to believe 'Most motorists in South Africa pay speeding fines' (40.8% vs. 27.9%, OR = 1.8,  $p = .033$ ) and participants with primary school education were more likely to assert 'It is time-consuming to pay speeding fines' (49.5% vs. 31.8%, OR = 2.1,  $p = .003$ ).

### ***Behavioural Beliefs and Attitudes***

As seen in Table 1, few participants believe that there are no consequences for not paying (11.9%); however, most participants reported they would pay fines if not doing so had serious consequences (86.2%) or having unpaid fines prevented them from renewing their driver's licence (83.64%). Motorists who report not paying fines were 2.9 times as likely to believe non-payment of fines has no consequences (OR = 0.35).

### ***Normative Beliefs and Subjective Norms***

As evident in Table 1, slightly more than a third of participants said they believe most SA motorists pay fines (34.5%), while three-quarters said that family members and close friends would be disappointed if they failed to pay (70.1%). More than 80% of participants agreed that transgressors should always pay speeding fines (86.6%), and family members and close friends believe that people should always pay speeding fines (82.1%). There were significant differences in the endorsement of normative statements between participants who report always paying fines and those who report never/sometimes paying fines, with fine payers significantly more inclined to endorse the following normative beliefs that support fine payment: 'Transgressors should always pay speeding fines' (OR = 3.63), 'My family members and close friends believe that people should always pay speeding fines' (OR = 2.55), and 'My family members and close friends would be disappointed in me if I did not pay speeding fines' (OR = 2.08).

### ***Control Beliefs and Perceived Behavioural Control***

As seen in Table 1, less than half of the participants believe paying fines is time-consuming (39.2%) and complicated (49.3%), while more than half agreed they could afford to pay fines (57.5%) and they would pay fines if fines not paid within 3 months were doubled (65.3%). Almost all participants (95.5%) agreed they would pay if a 50% discount was given for paying within 3 months. Significant differences were observed between those who report always paying fines and those who report never/sometimes paying, with motorists who report non-payment being 1.7 times as likely to believe paying fines is time-consuming (OR = 0.58) and 2.6 times as likely to believe paying fines is complicated (OR = 0.39). Participants who report always paying fines were approximately 2 times as likely to affirm that they can afford to pay (OR = 1.91) and 2.5 times as likely to report that they would pay if they knew the fine would be doubled if not paid within 3 months (OR = 2.59). Interestingly, incentivising fine payment by discounting or increasing fines was no more strongly associated with fine payment among participants who report being able to afford to pay fines and those unable to afford fines.

**Table 1.** Bivariate analysis of associations between motorists' attitudes/beliefs and self-reported fine paying.

	Endorsement of the statement among total sample of motorists who have received speeding fines ( <i>n</i> = 268)		Endorsement of the statement among motorists who sometimes/never pay fines ( <i>n</i> = 99)		Endorsement of the statement among motorists who always pay fines ( <i>n</i> = 169)		Chi-square test	Bivariate regression analysis	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>p</i> value	OR	95% CI
<b>Behavioural Beliefs and Attitudes</b>									
Nothing would happen if I don't pay my speeding fines.	32	11.9	19	19.2	13	7.7	.005*	0.35	[0.16, 0.74]*
I would pay my speeding fines if not doing so had serious consequences.	231	86.2	84	84.8	147	87.0	.625	1.19	[0.59, 2.42]
I would pay my speeding fines if I am not allowed to renew my driver's licence with outstanding fines against my name.	224	83.6	80	80.8	144	85.2	.348	1.37	[0.71, 2.64]
<b>Normative Beliefs and Subjective Norms</b>									
Transgressors should always pay speeding fines.	232	86.6	76	76.8	156	92.3	.000*	3.63	[1.74, 7.56]*
My family members and close friends believe that people should always pay speeding fines.	220	82.1	72	72.7	148	87.6	.004*	2.55	[1.34, 4.83]*
My family members and close friends would be disappointed in me if I did not pay speeding fines.	188	70.1	60	60.6	128	75.7	.007*	2.08	[1.22, 3.56]*
Most motorists in South Africa pay speeding fines.	95	35.4	34	34.3	61	36.1	.755	1.09	[0.64, 1.83]
<b>Control Beliefs and Perceived Behavioural Control</b>									
It is time-consuming to pay speeding fines.	105	39.2	47	47.5	58	34.3	.033*	0.58	[0.35, 0.96]*
It is complicated to pay speeding fines.	132	49.3	63	63.6	69	40.8	.000*	0.39	[0.24, 0.66]*
I can afford to pay speeding fines.	154	57.5	47	47.5	107	63.3	.011*	1.91	[1.15, 3.16]*
I would pay my speeding fines if a 50% discount is given for paying within 3 months.	256	95.5	93	93.9	163	96.4	.338	1.75	[0.55, 5.59]
I would pay my speeding fines if I knew that the fine would be doubled if I had not paid it within 3 months.	175	65.3	51	51.5	124	73.4	.000*	2.59	[1.54, 4.37]*

OR: odds ratio; CI: confidence interval.

\**p* < .05.



**Table 2.** Multivariate regression analysis of best fitting combination of beliefs/attitudes associated with self-reported fine paying.

	aOR	95% CI
<b>Behavioural Beliefs and Attitudes</b>		
Nothing would happen if I don't pay my speeding fines.	0.31*	[0.13, 0.73]
<b>Normative Beliefs and Subjective Norms</b>		
Transgressors should always pay speeding fines.	2.03	[0.83, 4.98]
My family members and close friends believe that people should always pay speeding fines.	1.15	[0.51, 2.59]
My family members and close friends would be disappointed in me if I did not pay speeding fines.	1.40	[0.72, 2.72]
<b>Control Beliefs and Perceived Behavioural Control</b>		
It is time-consuming to pay speeding fines.	1.07	[0.58, 1.97]
It is complicated to pay speeding fines.	0.34*	[0.19, 0.62]
I can afford to pay speeding fines.	1.30	[0.72, 2.34]
I would pay my speeding fines if I knew that the fine would be doubled if I had not paid it within 3 months.	2.32*	[1.29, 4.16]

aOR: adjusted odds ratio; CI: confidence interval.

\* $p < .05$ .

### *Multivariate prediction model of willingness to pay fines*

In the final step of the analysis, we estimated a multivariate logistic regression model to quantify the proportion of variance in fine-paying behaviour accounted for by the combination of beliefs identified as significant in the preceding analysis (Table 2). In this multivariate model, the only beliefs that were significantly associated with fine paying were the following: 'I would pay my speeding fines if I knew that the fine would be doubled if I had not paid it within 3 months' (OR=2.32), 'Nothing would happen if I don't pay my speeding fines' (OR=0.31), and 'It is complicated to pay speeding fines' (OR=0.34). The model was statistically significant and accounted for 21.6% of the variance in fine paying— $\chi^2(8)=45.46$ ,  $p < .001$ ,  $R^2 = .216$ .

## **Discussion**

It is surprising that 10.7% of participants report never paying speeding fines, markedly less than would be predicted based on previous studies indicating that the majority of motorists do not settle fines (Du Plessis et al., 2020). This finding probably reflects the social desirability bias, given that research participants typically present themselves favourably (Fisher & Katz, 2000). In research on sensitive issues, like adherence to the law, it is not uncommon for research participants to misrepresent their actions in self-report surveys (Krumpal, 2013). Future research should consider alternative methods of asking participants about fine-paying behaviour, including the use of anonymous internet-based surveys (Joinson, 1999), measuring response times to detect deception (Suchotzki et al., 2017), and utilising implicit association tests (Greenwald et al., 2009).

As predicted by the TPB, we found significant associations between motorists' readiness to pay fines and behavioural beliefs/attitudes, normative beliefs, and control beliefs. These data suggest the TPB may be a suitable model for conceptualising behavioural interventions to promote fine payment in SA. Below, we discuss the most important implications of findings, in terms of the core constructs of the TPB.

### *Behavioural Beliefs and Attitudes*

Our data show that non-payment of fines is strongly associated with believing that there are no consequences for not complying, and that this belief is one of the strongest predictors of fine payment. In the final multivariate model, controlling for the effects of all other significant variables, individuals who believe there are no consequences for non-payment were 3.2 times as likely to report non-payment, suggesting that it may be effective to employ strategies that ensure there are inevitable (predictably certain) consequences for non-payment. Our data, however, also show that readiness to pay fines is not associated with imposing more serious consequences (e.g., not being able to renew drivers' licences), a finding which is at odds with some of the stringent measures outlined in the AARTO Act (Government Gazette, 2019). Taken together, these findings suggest that it may be more effective to ensure certainty of consequences rather than simply promoting more stringent penalties.

### *Normative Beliefs and Subjective Norms*

Motorists who report paying fines are significantly more likely to endorse normative beliefs that encourage payment. These findings suggest that it may be helpful to harness the power of social disapproval to encourage fine payment by influencing motorists' perception of social norms and reinforcing the belief that paying fines is the right thing to do. Such an approach is supported by empirical evidence that prosocial behaviour is strongly predicted by what other members of society judge to be the correct social norm and that the development of prosocial behaviour is powerfully shaped by an innate psychological propensity to respond to normative information (House et al., 2020). In particular, empirical research shows that injunctive norms (i.e., norms specifying whether most people approve/disapprove of behaviour) are more useful in producing desirable behaviour than descriptive norms (i.e., norms specifying what most people do) (Kallgren et al., 2000), as is congruent with our findings.

### *Control Beliefs and Perceived Behavioural Control*

Our data show that motorists who report paying fines are significantly more likely to hold control beliefs about the ease with which fines can be settled. These findings suggest that it may be helpful to make it as easy and convenient as possible to pay fines and to publicise this to motorists. Such an approach is supported by empirical data showing that individuals are less likely to adopt normative behaviour if doing so is inconvenient (Ozaki, 2011). As already discussed, financial considerations are an important determinant of whether a fine is paid (Donnelly et al., 2016; Jou et al., 2014). It is thus significant that only 56.6% of participants said they could afford to pay fines, and that those who reported always paying were significantly more likely to affirm that they can afford to pay. This suggests that it might be important to consider how the value of speeding fines is determined and whether a means-based formula should be used to determine the optimal rational value of fines (Jou et al., 2014). It is unclear from our data why individuals who cannot afford to pay fines would put themselves in the position of obtaining a fine by transgressing the law; nonetheless, this finding points to the fact that financial considerations are not the only determinant of motorists' compliance, and may not even be the primary motive for complying with the law (Zhao et al., 2019). Interestingly, participants report they would be significantly more inclined to pay fines if they knew unpaid fines would be doubled in 3 months, but offering a 50% discount for payment within 3 months was not associated with increased odds of payment (a finding which may be a result of the fact that there was insufficient variance in responses to this item with 95.5% of the

total sample endorsing this statement). Our data suggest it may be effective to consider additional penalties for late payment, an approach which is entirely consistent with the concept of loss aversion in prospect theory (Tversky & Kahneman, 1992).

In summary, our data suggest that behavioural interventions conceptualised within the framework of TPB may be helpful in increasing fine payment in SA. Such behavioural interventions might include promoting certainty that there will be consequences for non-payment, providing motorists with information about other people's disapproval of noncompliance, penalising late payments, educating motorists about the ease and convenience with which fines can be paid, and making it affordable for motorists to pay fines. Such strategies are congruent with evidence-based practice for promoting road safety (Fylan & Stradling, 2014) and with the theory of behavioural nudges (Straßheim & Beck, 2019). It is, however, unlikely that these behavioural interventions on their own will be sufficient to improve fine payment, since behavioural nudges alone cannot solve complex policy problems like promoting law abidance (Selinger & Whyte, 2012). Crucially, our data show that the variables we investigated only account for 21.6% of the variance in fine-paying behaviour, highlighting that other factors (which may include motorists' perception of the legitimacy of the law and judicial system in SA, and their understanding of the need for speeding laws) account for most of the variance in compliance. More in-depth qualitative research is required to identify these additional factors and how cultural contexts may play a part in SA motorists' behaviour.

Among the limitations of this study are its small sample size, its cross-sectional research design, and the reliance on self-reports of fine-paying behaviour. Future studies are needed that draw on larger and more representative samples, and which employ longitudinal and experimental research designs with objective measures of fine payment. Our use of quantitative methods is helpful for an initial exploration of the potential application of the TPB to understanding motorists' behaviour; however, this method is limited, in that it obscures more subtle subjective individual factors that may help to understand complex human behaviours. To this end, future studies should also employ qualitative methods to explore this topic.

## Conclusion

To the extent that participants are honest about their fine-paying behaviour, our data show how payment of speeding fines in SA could be influenced by motorists' perceptions of the consequences of non-payment, subjective and social norms, and control beliefs including motorists' ability to pay fines and perception of the ease with which fines can be settled. This study provides novel insights into the potential of using theories of behaviour change to design evidence-based behavioural interventions to encourage motorists to comply with speeding fines and hence to improve road safety in SA.

## Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was made possible with financial support from South African National Research Foundation (Human and Social Dynamics in Development Grant) and a grant awarded to Jason Bantjes from the South African Medical Research Council (SAMRC), under the MCS programme. The views expressed here are not those of the NRF or SAMRC.

**ORCID iD**

Jason Bantjes  <https://orcid.org/0000-0002-3626-9883>

**Supplemental material**

Supplemental material for this article is available online.

**References**

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In Kuhl J & Beckmann J (eds) *Action control* (pp. 11–39). Springer. [https://doi.org/10.1007/978-3-642-69746-3\\_2](https://doi.org/10.1007/978-3-642-69746-3_2)
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Bantjes, J., du Plessis, S. W. F., Jansen, A. I., & Siebrits, F. K. (2021). *Better enforcement is essential, but may be inadequate: Findings of a survey on the factors affecting payment of speeding fines in Cape Town, South Africa* (Stellenbosch Working Papers 03/2021). Department of Economics & Bureau for Economic Research, Stellenbosch University. <https://www.ekon.sun.ac.za/wpapers/2021>
- da Silva, R. A., Cardoso, T., d. A., Mondin, T. C., Neumann Reyes, A., de Lima Bach, S., Souza, L. D. d. M., & Jansen, K. (2017). Is narrative cognitive therapy as effective as cognitive behavior therapy in the treatment for depression in young adults? *Journal of Nervous and Mental Disease*, 205(12), 918–924. <https://doi.org/10.1097/NMD.0000000000000758>
- Donnelly, N., Poynton, S., & Weatherburn, D. (2016). *Willingness to pay a fine* (Crime and Justice Bulletin No. 195). NSW Bureau of Crime Statistics and Research.
- Du Plessis, S., Du Jansen, A., & Siebrits, K. (2019). The limits of laws : Traffic law enforcement in South Africa. *South African Journal of Economic and Management Sciences*, 23(1), 1–11. <https://doi.org/10.4102/sajems.v23i1.343>
- Du Plessis, S., Hartig, B., Jansen, A., & Siebrits, K. (2020). Improving payment of traffic fines with financial incentives: Discounts vs. penalties. *Transportation Research Part F: Traffic Psychology and Behaviour*, 74, 298–306.
- Evans, D., & Norman, P. (1998). Understanding pedestrians' road crossing decisions: An application of the theory of planned behaviour. *Health Education Research*, 13(4), 481–489. <https://doi.org/10.1093/her/13.4.481-a>
- Fisher, R. J., & Katz, J. E. (2000). Social-desirability bias and the validity of self-reported values. *Psychology and Marketing*, 17(2), 105–120. [https://doi.org/10.1002/\(SICI\)1520-6793\(200002\)17:2<105::AID-MAR3>3.0.CO;2-9](https://doi.org/10.1002/(SICI)1520-6793(200002)17:2<105::AID-MAR3>3.0.CO;2-9)
- Fylan, F., & Stradling, S. (2014). Behavioural Change Techniques used in road safety interventions for young people. *European Review of Applied Psychology*, 64(3), 123–129. <https://doi.org/10.1016/j.erap.2014.02.003>
- Government Gazette. (2019). *Administrative Adjudication of Road Traffic Offences Act (Act 4 of 2019)*. <http://pmg-assets.s3-website-eu-west-1.amazonaws.com/AARTO.pdf>
- Greenwald, A. G., Poehlman, T. A., Uhlmann, E. L., & Banaji, M. R. (2009). Understanding and using the Implicit Association Test: III. Meta-analysis of predictive validity. *Journal of Personality and Social Psychology*, 97(1), 17–41. <https://doi.org/10.1037/a0015575>
- Hardeman, W., Johnston, M., Johnston, D., Bonetti, D., Wareham, N., & Kinmonth, A. L. (2002). Application of the theory of planned behaviour in behaviour change interventions: A systematic review. *Psychology & Health*, 17(2), 123–158. <https://doi.org/10.1080/08870440290013644a>
- House, B. R., Kanngiesser, P., Barrett, H. C., Broesch, T., Cebicoglu, S., Crittenden, A. N., Erut, A., Lew-Levy, S., Sebastian-Enesco, C., Smith, A. M., Yilmaz, S., & Silk, J. B. (2020). Universal norm psychology leads to societal diversity in prosocial behaviour and development. *Nature Human Behaviour*, 4(1), 36–44. <https://doi.org/10.1038/s41562-019-0734-z>
- Joinson, A. (1999). Social desirability, anonymity, and internet-based questionnaires. *Behavior Research Methods, Instruments, & Computers*, 31(3), 433–438. <https://doi.org/10.3758/BF03200723>

- Jou, R. C., Hensher, D., & Chen, K. H. (2014). Freeway drivers' willingness to pay for speeding fines. *Transportation Letters*, 6(1), 14–22. <https://doi.org/10.1179/1942787513Y.0000000007>
- Kallgren, C. A., Reno, R. R., & Cialdini, R. B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior. *Personality and Social Psychology Bulletin*, 26(8), 1002–1012. <https://doi.org/10.1177/01461672002610009>
- Kessler, R. (2020). Does punishment compel payment?: Driver's license suspensions and fine delinquency. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3545324>
- Krumpal, I. (2013). Determinants of social desirability bias in sensitive surveys: A literature review. *Quality & Quantity*, 47(4), 2025–2047. <https://doi.org/10.1007/s11135-011-9640-9>
- Moan, I. S., & Rise, J. (2011). Predicting intentions not to 'drink and drive' using an extended version of the theory of planned behaviour. *Accident Analysis & Prevention*, 43(4), 1378–1384. <https://doi.org/10.1016/j.aap.2011.02.012>
- Ozaki, R. (2011). Adopting sustainable innovation: What makes consumers sign up to green electricity? *Business Strategy and the Environment*, 20(1), 1–17. <https://doi.org/10.1002/bse.650>
- Quilter, J., & Hogg, R. (2018). The Hidden Punitiveness of Fines. *International Journal for Crime, Justice and Social Democracy*, 7(3), 9–40. <https://doi.org/10.5204/ijcjsd.v7i3.512>
- Ritchey, M., & Nicholson-Crotty, S. (2011). Deterrence theory and the implementation of speed limits in the American states. *Policy Studies Journal*, 39(2), 329–346. <https://doi.org/10.1111/j.1541-0072.2011.00410.x>
- Road Traffic Management Corporation. (2015, March). *Traffic offence survey*.
- Road Traffic Management Corporation. (2016a). *National Road Safety Strategy 2016–2030*.
- Road Traffic Management Corporation. (2016b, December). *Traffic offence survey*.
- Selinger, E., & Whyte, K. P. (2012). Nudging cannot solve complex policy problems. *European Journal of Risk Regulation*, 3(1), 26–31. <https://doi.org/10.1017/S1867299X0000177X>
- Şimşekoğlu, Ö., & Lajunen, T. (2008). Social psychology of seat belt use: A comparison of theory of planned behavior and health belief model. *Transportation Research Part F: Traffic Psychology and Behaviour*, 11(3), 181–191. <https://doi.org/10.1016/j.trf.2007.10.001>
- StatsSA. (2019a). Mortality and causes of death in South Africa, 2016: Findings from death notification. *Mortality*, 27(12), 1–138.
- StatsSA. (2019b). *Unemployment rises slightly in third quarter of 2019*.
- Stead, M. (2004). Development and evaluation of a mass media Theory of Planned Behaviour intervention to reduce speeding. *Health Education Research*, 20(1), 36–50. <https://doi.org/10.1093/her/cyg093>
- Straßheim, H., & Beck, S. (2019). *Handbook of behavioural change and public policy*. Edward Elgar. <https://doi.org/10.4337/9781785367854>
- Suchotzki, K., Verschuere, B., Van Bockstaele, B., Ben-Shakhar, G., & Crombez, G. (2017). Lying takes time: A meta-analysis on reaction time measures of deception. *Psychological Bulletin*, 143(4), 428–453. <https://doi.org/10.1037/bul0000087>
- Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, 5(4), 297–323. <https://doi.org/10.1007/BF00122574>
- Watson, B., Siskind, V., Fleiter, J. J., Watson, A., & Soole, D. (2015). Assessing specific deterrence effects of increased speeding penalties using four measures of recidivism. *Accident Analysis & Prevention*, 84, 27–37. <https://doi.org/10.1016/j.aap.2015.08.006>
- Zhao, D., Han, F., Meng, M., Ma, J., & Yang, Q. (2019). Exploring the influence of traffic enforcement on speeding behavior on low-speed limit roads. *Advances in Mechanical Engineering*, 11(12), 1–9. <https://doi.org/10.1177/1687814019891572>