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How do perceptions of procedural justice, police legitimacy, and legitimacy of laws influence intentions to drug drive?

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ABSTRACT

Introduction: There is a need for improved drug driving enforcement to promote greater driver compliance with drug driving laws. In Australia, Roadside Drug Testing (RDT) suffers from operational challenges that undermine its effectiveness in reducing drug driving. *Objective*: To identify potential improvements to RDT, this study investigated the extent to which drivers perceive RDT to be procedurally just and that the policing of drug driving and the associated laws are legitimate. These perceptions were then compared with those applying to Random Breath Testing (RBT) and examined in relation to their respective influence on intentions to drug and drink drive in the future. *Method*: A sample of 1,483 licensed drivers from three Australian states completed an online survey. *Results:* Those participants who reported engaging in drug driving perceived RDT to be less procedurally just than non-drug drivers. Similarly, drug drivers perceived the police and associated drug driving laws to be less legitimate than non-drug drivers. Furthermore, drug drivers who had been tested at an RDT operation in the past perceived RDT to be less procedurally just and considered drug driving policing and laws to be less legitimate, compared with the corresponding perceptions of drink drivers who had been tested at an RBT operation. A regression analysis indicated that stronger intentions to drug drive in the future were associated with lower perceptions of police legitimacy and the legitimacy of drug driving laws, but not with the elements of procedural justice. However, follow-up analyses indicated that the influence of procedural justice on intentions was mediated by the two legitimacy variables, thus weakening its direct impact on intentions. *Practical applications:* The results highlight the need for road safety authorities to enhance the perceived legitimacy of drug driving enforcement and associated laws. Changes to current police practices and/or drug-driving laws may also be needed to enhance the effectiveness of RDT.

1. Introduction

Road policing largely involves roadside interactions between police and drivers, such as occurs during Roadside Drug Testing (RDT), the primary countermeasure used to deter drug driving in Australia (Bates et al., 2012). Through this countermeasure, police officers can randomly stop any driver on the side of the road to conduct an RDT test that checks for the presence of particular drugs. Unlike Random Breath Testing (RBT) for alcohol, where the driver has to breathe into a testing device, RDT is conducted by handing the driver a swabbing device that collects saliva. If the driver tests positive, police officers collect additional oral fluid and blood samples for confirmatory laboratory analysis (Davey et al., 2017; Mills & Truelove, 2024).

Designed primarily on the basis of deterrence theory, RDT suffers from various operational challenges including the high costs associated with supplying and implementing tests, which in turn hinder attempts to increase the annual number of tests and public exposure to them (Love et al., 2022; Mills, Freeman, et al., 2022). Therefore, RDT is often conducted at times and places where police consider drug driving more likely and selection of drivers for testing may not be random (Anderson

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et al., 2021). The way that RDT and RBT are conducted is different, and this might produce differential effects on drug and drink driving perceptions and related behavior. For instance, performing breath testing for alcohol is faster and cheaper than oral fluid testing for drugs (National Drug Driving Working Group, 2018), and therefore, police can conduct far more RBT tests per year and in a more random manner than is the case for RDT (Cameron, 2013). Moreover, as with drink driving, personal experiences of avoiding detection for drug driving appear to further encourage the behavior (Armstrong et al., 2018; Freeman et al., 2021; Truelove et al., 2022). Unless these challenges are adequately addressed, they can serve to undermine the perceived certainty, severity or swiftness of punishment for drug driving, and thus the deterrent effect of RDT (Armstrong et al., 2018; Watling & Freeman, 2011; Watling et al., 2010). Such impediments to RDT operations highlight the need to identify improvements to police enforcement practices that will not only increase drivers' cooperation with legal authorities but enhance compliance with road rules in the first place (Reisig et al., 2012). While road policing initiatives have historically been informed by deterrence principles (Armstrong et al., 2018; Freeman et al., 2015; Truelove et al., 2017), another approach to promote compliance with road rules is to enhance drivers' perceptions of the fairness of the police role and the legitimacy of the legal system. In particular, there is a growing interest in using the concept of procedural justice to better understand these perceptions and to guide improvements to police practices (Bates, 2014; Tudor-Owen, 2021). While considerable research has been undertaken on procedural justice in the areas of criminal justice, such as general policing (Bennett et al., 2019), courts (Wales et al., 2010) and corrections (Ryan & Bergin, 2022), further research is needed into its impact on road safety and behavioral compliance (Bates, 2014; Walters & Bolger, 2019).

Procedural justice focuses on individuals' perceptions of how fairly they are treated by authorities, such as the police, and how this influences the perceived suitability of that authority to be obeyed and trusted (Murphy et al., 2014; Sunshine & Tyler, 2003). This concept comprises four components: respect, trustworthiness, neutrality, and voice (Bates, 2014; Madon et al., 2022). It proposes that if individuals believe they are able to express their opinions while interacting with the police, and the police in turn treat them with respect and in a neutral, best-interest-oriented manner, this will positively influence subsequent behavior by those individuals (Bates, 2014; Goodman-Delahunty, 2010; Murphy & Barkworth, 2014; Murphy et al., 2014). Therefore, when a positive interaction occurs, drivers will be motivated to cooperate with the police and comply with the road rules in the future, even if that interaction results in a penalty for the offense. As such, drivers' experience of police enforcement and their knowledge of penalties associated with offending behavior is an essential area of examination (Bates, 2014).

Previous research within a road safety context has highlighted the usefulness of a procedural justice framework (e.g., Bates et al., 2023; MacQueen & Bradford, 2015; Sahin et al., 2017). For instance, a study incorporating the principles of procedural justice in a flyer designed as an intervention to reduce speeding offenses found that this intervention was perceived as just and was successful in reducing actual subsequent offending among drivers aged 25 and over (Bates et al., 2023). Additionally, an investigation of the impact of one-on-one police-driver encounters at RBT operations in Australia indicated that a procedurally just approach resulted in stronger perceptions of fairness and enhanced levels of cooperation with the police (Mazerolle et al., 2012). While RBT is widely implemented and has been reported as the most common reason for people to come into contact with the police in Australia, exposure to other forms of enforcement, such as RDT is less frequent (Roberts & Indermaur, 2009). As such, findings of research conducted with more frequent enforcement approaches such as RBT or speed cameras may not directly apply to RDT operations.

Policing research has also indicated that procedural justice is linked to the perceived legitimacy of the police and related laws (Cherney & Murphy, 2013; Hinds & Murphy, 2007). It appears that higher perceptions of procedural justice can increase legitimacy, which in turn can improve compliance (Trinkner et al., 2019). Importantly, to obtain people's support and compliance with the rules, the authority enforcing these rules must be considered legitimate (Hinds & Murphy, 2007). Police legitimacy is defined as people's confidence in the police and in the validity of their decisions, so that they are entitled to be obeyed (Hamm et al., 2017; Hinds & Murphy, 2007). Ultimately, stronger perceptions of police legitimacy will lead to greater levels of compliance and cooperation. Watling and Freeman (2011) have argued, using defiance theory, that the perceived fairness of the incurred sanctions and the perceived legitimacy of the sanctioning body may influence the effectiveness of these sanctions. Their results indicated that the more the individuals believe in the legitimacy of the sanctioning authority, the less likely they are to intend to drug drive in the future. However, the study also reported that the perceived fairness of sanctions was not a significant predictor of self-reported drug driving.

Given that laws are enforced through police operations (Cherney & Murphy, 2013), disputes about the fairness of these laws and the appropriateness of their implementation may weaken the perceived legitimacy of the police (Wilson, 2011). This concept was investigated in an Australian study that measured the perceptions of RDT legitimacy among illicit drug users and how their attitudes intersect with deterrence and strategies to evade detection (Wilson, 2011). The study found that some interviewees challenged the legitimacy and validity of RDT and reported actively engaging in evasion strategies to avoid detection. Indeed, the *zero-tolerance* laws underpinning the RDT program across Australia, which prohibit the presence of any detectable amount of the listed illicit drugs in the system, were seen as unjust by some drivers and RDT operations were perceived as another form of governance conducted for the purpose of revenue raising (Love et al., 2022; Mills, Truelove, et al., 2022; Wilson, 2011). Furthermore, previous research has shown that some drivers believe that stand-alone toxicological evidence obtained through RDT should not be considered sufficient for a drug driving conviction, as it only shows the presence of drugs rather than impairment (Hasan et al., 2022; Love et al., 2022).

Although there is growing interest in how perceptions of procedural justice, the legitimacy of police, and the legitimacy of laws influence compliance with relevant laws, further research is required to understand the exact nature of these relationships. For example, while some research has suggested that perceptions of procedural justice exert a direct influence on behavioral outcomes of interest (Trinkner et al., 2019), other studies have indicated that its influence is mediated by the perceived legitimacy of police and laws (Kim et al., 2019).

Drink driving and drug driving are complex behaviors, subject to multiple forms of drinking and driving and many types and patterns of drug use and driving. Since RBT has proven successful in reducing drink driving (Bates, Soole, & Watson, 2012; Ferris et al., 2013; Bureau of, 2022), it is worthwhile to compare drink and drug driving so that insights can be drawn that help improve RDT operations in reducing drug driving. To do so, this study utilizes a theoretical framework combining the concepts of procedural justice, the legitimacy of police, and the legitimacy of laws. Procedural justice and the legitimacy of police and related laws are being increasingly applied in road safety research, including studies of drug driving and RDT testing (Watling & Freeman, 2011; Wilson, 2011), RBT encounters (Bates et al., 2015; Mazerolle et al., 2013; Mazerolle et al., 2015; Mazerolle et al., 2012; Murphy et al., 2014), traffic violations (Hertogh, 2015; Tankebe et al., 2020), speed enforcement (Barkworth & Murphy, 2015; Bates et al., 2016; Bates et al., 2023; Bates et al., 2022; Wells, 2008), and young drivers (Bates et al., 2021). However, the consideration of procedural justice in combination with the legitimacy of police and associated laws represents a novel contribution to road safety research, particularly in relation to drug driving behavior.

1.1. Aim

The overarching aim of the study was to identify potential opportunities to enhance the enforcement of drug driving laws in Australia. To do this, the study had three key objectives. The first (Objective 1) was to investigate the extent to which different groups of drivers perceive RDT to be procedurally just and consider the policing of drug driving and the associated laws to be legitimate. Of particular interest was whether these perceptions were influenced by engaging in drug driving or experiencing RDT in operation. The second objective (Objective 2) was to compare the drug driving enforcement perceptions with those relating to the enforcement of drink driving. The final objective (Objective 3) was to examine the influence of these enforcement-related perceptions on intentions to both drug drive and drink drive in the future, after controlling for other factors known to influence these behaviors such as sociodemographic variables and substance dependence.

Self-reported intentions to drug drive and drink drive were assessed in relation to the next three months. Self-reported drug driving was measured based on driving a vehicle within one hour of taking drugs. Self-reported drink driving was defined in terms of driving within one hour of having consumed alcoholic drinks, rather than a specific blood alcohol concentration (BAC level). This definition of drink driving was adopted in order to make it more comparable with drug driving, since RDT tests for the presence of drugs rather than for a specified concentration.

2. Methods

2.1. Participants

The study utilized data from an online survey of drivers who were aged 18 years or over, had consumed alcohol and/or drugs in the past 12 months, held a valid driver's license (Australian or international), and lived in either of the Australian states of Queensland, New South Wales, or Victoria. Recruitment methods included Facebook advertising, Queensland University of Technology (QUT) mailing lists, and a psychology participant pool designated for first-year psychology students. All first-year psychology students received partial course credit for their participation, and other participants were entered into a draw to win one of six AUD $200 online vouchers. The study was conducted after obtaining the approval of the Human Research Ethics Committee at Queensland University of Technology (QUT) (approval number 2000001069).

In total, 1,483 participants aged 18–84 years (M = 37.8; SD = 16.6; 57.9% male) completed the survey. The female drivers in the sample were significantly younger than the male drivers ($p < 0.001$). Of the participants, 67.2% were employed (full or part-time), 76.7% held an open/full license (i.e., unrestricted), and they drove an average of 12.9 hours per week (median) (SD = 26.8). Among the participants, 193 indicated they were currently students, but anonymity requirements prevented identifying how many were first-year psychology students who were granted course credit for completing the survey.

Table 1 provides information about the demographic characteristics of the sample. Participants in this study were more likely to be male (58% vs. 51%), younger (30% vs. 12% aged 24 or younger), and less likely to hold an unrestricted license (78% vs. 88%) than driver license holders in the three states based on data obtained from the Bureau of Infrastructure Transport and Regional Economics (BITRE) (2021).

Table 1
Information on the sample's demographic and driving characteristics.

Total (N = 1,483)	N	%
Age		
Young adult (18–24)	449	30.3
Older adult (25+)	1,034	69.7
Gender		
Male	859	57.9
Female	609	41.1
Other	15	1.0
Marital status		
Single	528	35.6
Married/ have a partner	856	57.7
Divorced/ Widowed	99	6.7
Level of education		
Primary & secondary	497	33.5
Tertiary	986	66.5
Employment status		
Unemployed	424	28.6
Employed	1,059	71.4
License type*		
Provisional/ Probationary	332	22.4
Open/ Full/ Foreign driver's license	1,151	77.6
Average hours of driving per week		
Below 12 h	968	65.3
Over than 12 h	515	34.7

* In Queensland and New South Wales, the term "provisional" is used to describe the type of restricted license that drivers first receive after passing the Learner License test. In Victoria, the term "probationary" is used to describe this type of license.

2.2. Measures

The current study measured sociodemographic characteristics, substance dependence, experiences of police enforcement, and perceptions of procedural justice and legitimacy. Self-reported intentions to drive after taking drugs or alcohol in the future were the dependent variables used in the regression analyses. Australian jurisdictions consider a drug driving offense to be driving with any detectable amount of the listed drugs in the system. Therefore, to maintain comparability with this definition, drink driving was operationalized in this study as having driven within an hour of consuming alcohol, regardless of what a participant's estimated blood alcohol concentration (BAC) may have been. Across Australia, novice drivers (those holding a learner or provisional/probationary licenses) and professional drivers (such as truck and taxi drivers) are subject to either zero or 0.02% BAC limits. As such, driving with any alcohol in their system is likely to be illegal for these drivers. However, fully licensed drivers are subject to a 0.05% BAC limit. As a consequence, it is possible that some of the participants who were classified as drink drivers in this study were not necessarily over the limit at the time, and thus their behavior may actually not have been illegal. Nonetheless, it is likely that drink driving laws and their enforcement were still relevant to their decision-making.

2.2.1. Sociodemographic variables

The survey collected information on age, gender, driver's license status, level of income [based on the current categorization in Australia (Household Income and Wealth, 2022)] and hours of driving per week.

2.2.2. Substance use and dependence

The use of one or more of the following substances over the past three months was reported: alcohol, cannabis, MDMA, amphetamine, methamphetamine, cocaine, opioids, hallucinogens, GHB and other drugs. Previous research has shown that drug driving is influenced by drivers' level of substance dependence (Castro et al., 2023; Hasan et al., 2023), and thus this study used it as a control variable. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST, version 3.1) developed for the World Health Organization (WHO) was used to identify problematic substance use at a score of 4 or greater for drugs and 11 or greater for alcohol (i.e., medium- or high-risk) (Humeniuk et al., 2008; Humeniuk et al., 2010; Humeniuk & Holmwood, 2011). After participants chose their substance of use, they were asked six items about: frequency of use; urge to use, drug-induced life problems (i.e., financial, legal, etc.), failure to perform usual tasks, others' expressed concerns about the participant's drug use and unsuccessful attempts to cut down on use. Possible overall scores on the ASSIST scale range from

0 to 39, with three levels of risk of drug use: 0–3 indicating low risk, 4–26 indicating medium risk, and 27 or more indicating a high risk. The corresponding values for alcohol consumption are: 0–10 (low-risk), 11–26 (medium-risk), and +27 (high-risk). As a result, each participant's score was calculated, and problematic substance use was identified with a score of 4 or greater for drugs and 11 or greater for alcohol (i.e., medium- or high-risk) (Humeniuk et al., 2008).

2.2.3. Procedural justice

Four survey items adapted from previous research (Bates et al., 2016; Cherney & Murphy, 2013; Mazerolle et al., 2012) measured the procedural justice components of trustworthiness, respect, voice, and neutrality, respectively. Participants indicated on a five-point Likert scale how likely they would agree with statements related to these components if they were to be tested when they were driving within an hour of consuming alcohol or illegal drugs (e.g., *"the police officer would treat me with dignity and respect" 1= "very unlikely" to 5 = "very likely"*). A higher score on the scale indicated more favorable perceptions of procedural justice. The procedural justice scale exhibited a high level of internal consistency (Cronbach's alpha: 0.87 "drug driving items"; 0.86 "drink driving items") (For more details, see Table A2 in the Appendix).

2.2.4. Police legitimacy

Three items adapted from Cherney and Murphy (2013) and Hinds and Murphy (2007) were used to assess participants' perceptions of police legitimacy in terms of trust and confidence in the police (e.g., *"Respect for police is important to reduce the number of people who drink/drug drive" 1 = "strongly disagree" to 5 = "strongly agree"*). The three items showed good internal consistency (Cronbach's alpha: 0.75 "drug driving items"; 0.73 "drink driving items").

2.2.5. Legitimacy of the law

A legitimacy of the law scale was created based on three items adapted from Cherney and Murphy (2013). It assessed participants' commitment to the law and whether they thought the law was consistent with the values of their community (e.g., "*Most people in my community believe that people should not drive after taking illegal drugs: 1 = "strongly disagree" to 5 = "strongly agree"*). Higher scores reflected a perception that laws are legitimate. The scale had good internal consistency for drug driving (Cronbach's alpha: 0.77) but a lower consistency for drink driving (Cronbach's alpha: 0.65).

2.2.6. Experiences of police enforcement

The participants were asked how frequently they had observed the police conducting RDT or RBT (1 = "never" to 5 = "always") and if they had been tested at an RDT or an RBT operation. For analysis, the responses were recoded as "never tested" or "once or more."

2.2.7. Self-reported drink and drug driving

Drug driving frequency was measured on a 5-point Likert scale from "never" to "always" by asking participants if they "*had driven a vehicle within one hour of taking (selected drug/drugs) over the past 3 months.*" Previous research has shown that most self-reported impaired driving is reported within one hour of consumption (Cuttler et al., 2018; Goldenbeld et al., 2020), in which drivers tend to make risky decisions such as driving after consumption of alcohol or drugs. Therefore, the one-hour threshold was chosen in this study. Similarly, drink driving frequency was measured by asking participants if they "*had driven a vehicle within one hour of consuming alcohol over the past 3 months.*" Participants who reported drug or drink driving more often than "never" in the past 3 months were classified as drug or drink drivers, respectively.

2.2.8. Intentions

Participants' intentions were measured with three items that assessed willingness, likelihood, and intention to drive within an hour of taking illegal drugs in the next three months (e.g., *"It is likely that I will drive within an hour of taking illegal drugs"*) ($\alpha = 0.94$). These three items were informed by previous studies (Armstrong et al., 2018; Watling et al., 2010). Similarly, the intention to drive within an hour of consuming alcohol ($\alpha = 0.93$) was measured. All response choices were measured on a five-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree").

2.3. Data analysis

Data were analyzed using IBM Statistical Package for the Social Sciences (Version 28). Descriptive analyses were undertaken to compare the drug/drink driving enforcement-related perceptions across different groups of drivers. Descriptive and hierarchical linear regression analyses were then conducted to examine whether drivers' perceptions of procedural justice and legitimacy were related to self-reported intentions to drug or drink drive in the future. The independent variables included in the hierarchical regressions were sociodemographic characteristics (such as age and gender), driver's license type, hours of driving per week, substance dependence and perceptions of procedural justice and legitimacy. A summary of the independent variables included in the analyses is presented in Table A1 of the Appendix. Dummy coding was applied to the categorical variables, namely income (did not state [reference]; "less than $10,000 – $29,999" low income; "$30,000 – more than $150,000" middle & high income) and hours of driving per week (0 to 11 h: below median [reference]; 12 h and more: over median). "Male" was chosen as the reference category for gender compared to "Female + Other," while "Provisional/ Probationary license" was selected as the reference group for the driver's license type. Drugs and alcohol dependency was classified into five levels using the cut-offs described in Section 2.2.2. The significance level (α) for the descriptive and regression analyses was generally set at 0.05. However, besides testing for overall differences in procedural justice perceptions between various groups, follow-up tests were undertaken to test for differences in the four elements of *trustworthiness, respect, voice, and neutrality*. Consequently, a more stringent significance level ($\alpha = 0.013$) based on a Bonferroni correction was used for these follow-up tests, to protect against inflating the Type 1 error rate. To test whether the relationship between perceptions of procedural justice applying to RDT/RBT and intentions to engage in drug or drink driving was significantly mediated by the perceived legitimacy of police and drug/drink driving laws, a bootstrapping test was conducted. Bootstrapping was chosen as it is a non-parametric resampling procedure that does not rely on the assumption of normality and can build an empirical approximation by repeatedly sampling the dataset (Hayes, 2017). The level of confidence for all confidence intervals (CI) in the indirect effects was 95%, and the number of bootstrap resamples was 5000.

3. Results

3.1. Descriptive analysis

Overall, 286 (19.3%) participants reported driving within an hour after using at least one of the specified drugs. Most drug driving was reported after using cannabis (n = 205), opioids (n = 69) and cocaine (n = 32). In total, 595 (40.1%) respondents indicated driving after having consumed alcohol (with or without drugs) during the past three months.

In total, 768 participants (51.9% of the whole sample) met the threshold for problematic substance use (i.e., medium- or high-risk), of which 214 had a score indicative of problematic use of drugs-only, 344 for problematic use of alcohol-only, and 210 for problematic alcohol and drug use. Cannabis was the most common drug of problematic use (n = 370, 25%), followed by cocaine (n = 65, 4.4%). Furthermore, 245 participants with problematic substance use (i.e., medium- or high-risk) reported driving after having used drugs (with or without alcohol), and 416 reported driving after having consumed alcohol (with or without drugs).

3.2. Experiences of enforcement

More participants (96.6%) reported seeing police operating RBT than RDT (78.5%). Chi-square analyses showed a significant association between being a drug driver (χ^2 (1, N = 1,481) = 4.367, $p < 0.05$) and observing police conducting RDT. No significant differences were found between drug vs. non-drug drivers and drink vs. non-drink drivers in relation to having observed police conducting RBT tests.

Almost 85% of participants reported having been tested at least once in their lifetime by RBT, while 22.5% reported having been tested at least once by RDT. Chi-square analyses showed that drug drivers reported being tested by RDT (χ^2 (1, N = 1,482) = 52.68, $p < 0.001$) and RBT (χ^2 (1, N = 1,481) = 23.07, $p < 0.001$) more often than non-drug drivers. Similarly, drink drivers reported being tested by RDT (χ^2 (1, N = 1,482) = 36.44, $p < 0.001$) and RBT (χ^2 (1, N = 1,481) = 44.03, $p < 0.001$) more often than non-drink drivers.

3.3. Perceptions of procedural justice, police legitimacy and legitimacy of laws

The first two objectives of this study were to investigate the extent to which different groups of drivers perceive RDT to be procedurally just and consider the policing of drug driving and the associated laws to be legitimate (Objective 1) and to compare these drug driving enforcement perceptions with those relating to the enforcement of drink driving (Objective 2). To this end, a series of Mann-Whitney U were performed to determine whether there was a statistically significant difference between different groups of participants in terms of perceptions of procedural justice, police legitimacy and legitimacy of laws. The Mann-Whitney U was chosen due to the non-normal distributions of the perception-related variables. Table 2 summarizes the comparisons between groups analyzed in the following sections. As shown in the table, the row cell is compared (higher/ no difference/ lower) to column cells while blanks indicate no comparison was made.

3.3.1. Drug drivers versus Non-drug drivers

The extent to which RDT was perceived to be procedurally just was lower among the self-reported drug drivers compared to the non-drug drivers ($U = 126625.5$, $p < 0.001$). Furthermore, perceptions of the procedural justice elements of respect ($U = 135112.0$, $p < 0.001$), voice ($U = 136698.5$, $p < 0.001$), neutrality ($U = 122370.0$, $p < 0.001$), and trustworthiness ($U = 137776.5$, $p < 0.001$) were all significantly lower among drug drivers compared to non-drug drivers. Similarly, drug drivers had lower perceptions of police legitimacy ($U = 100122.5$, $p < 0.001$) and legitimacy of laws related to drug driving ($U = 72285.0$, $p < 0.001$) than non-drug drivers.

Table 2
Drug and drink drivers' perceptions of procedural justice, police legitimacy and legitimacy of laws (regardless of being tested or not).

	Compared to	Non-drug drivers	Non-drink drivers	Drink drivers
Perceptions of Procedural Justice of	Drug drivers	*Lower*		*Lower*
	Drink drivers		*No difference*	
Perceptions of Police Legitimacy of	Drug drivers	*Lower*		*Lower*
	Drink drivers		*Lower*	
Perceptions of Legitimacy of Laws of	Drug drivers	*Lower*		*Lower*
	Drink drivers		*Lower*	

3.3.2. Drink drivers vs. Non-drink drivers

There were no significant differences in overall perceptions of procedural justice of RBT between drink drivers and non-drink drivers. Perceptions of police legitimacy ($U = 221098.5$, $p < 0.001$) and legitimacy of laws related to drink driving ($U = 223603.0$, $p < 0.001$) were lower among drink drivers compared to non-drink drivers. Additional analyses were undertaken to explore whether these perceptions may have been influenced by the definition of drink driving adopted in this study (i.e., driving within an hour of consuming alcohol). Firstly, it is important to note that one-tenth of the participants who reported drink driving in the sample held a provisional/probationary driving license and were thus subject to a zero-alcohol limit. As such, it is likely that these drivers would have been driving illegally if they drove within one hour of consuming alcohol. Nonetheless, to check for potential differences, we ran a Mann-Whitney U test among the pool of provisional/probationary driver's license holders only, which showed that there were no significant differences in perceptions of procedural justice and police legitimacy between these drink drivers and their non-drink driving counterparts. However, perceptions of the legitimacy of laws related to drink driving were significantly lower among the provisional/probationary licensed drink drivers ($U = 5519.0$, $p < 0.01$) compared to their non-drink driving counterparts. In the case of the participants who held full driver's licenses and reported drink driving, it was not possible to distinguish between those who only consumed small amounts of alcohol prior to driving (and thus might have considered themselves to be under the legal limit for driving) and those who consumed larger amounts of alcohol (and thus were knowingly driving illegally). Bearing this in mind, no significant differences in procedural justice perceptions were found between the fully licensed drink drivers and non-drink drivers. However, perceptions of police legitimacy ($U = 140468.5$, $p < 0.001$) and legitimacy of laws related to drink driving ($U = 144498.5$, $p < 0.001$) were significantly lower among drink drivers than non-drink drivers (with full driver's licenses only). Further exploration showed that drink drivers with provisional/probationary driver's licenses perceived RBT to be less procedurally just ($U = 11079.0$, $p < 0.05$) than the drink drivers with full driver's licenses. No statistical differences were found between these two groups in terms of perception of the legitimacy of police and related laws.

3.3.3. Drug drivers vs. Drink drivers

Drug drivers perceived RDT to be less procedurally just than the drink drivers perceived RBT to be ($U = 15098.0$, $p < 0.001$). All four of the procedural justice elements were significantly lower among the drug drivers compared to the drink drivers [respect ($U = 16431.0$, $p < 0.001$), voice ($U = 17001.5$, $p < 0.001$), neutrality ($U = 16680.5$, $p < 0.001$) and trustworthiness ($U = 15828.0$, $p < 0.001$)]. Moreover, perceptions of police legitimacy ($U = 14682.5$, $p < 0.001$) and legitimacy of laws relating to drug driving enforcement ($U = 10663.0$, $p < 0.001$) were lower among drug drivers compared to the drink drivers' perceptions relating to drink driving enforcement. Taking the type of driver's license into account, no statistical differences were found between drug drivers and drink drivers with provisional/probationary driver's licenses, whereas drug drivers perceived RDT to be less procedurally just ($U = 13626.0$, $p < 0.001$) than fully licensed drink drivers perceived RBT to be.

3.3.4. RDT/RBT tested vs. Non-tested drivers

The following analyses compare the enforcement-related perceptions of participants in terms of whether they reported having been tested by either RDT or RBT and self-reported drug/drink driving or not. Table 3 displays the median values of perceptions of procedural justice, police legitimacy and legitimacy of the law, while Table 4 summarizes the comparisons between the different groups. As shown in Table 4, the row cell is compared (higher/ no difference/ lower) to column cells while blanks indicate no comparison was made.

Among the full sample, participants who had been tested by RDT

Table 3
Median values of perceptions of procedural justice, police legitimacy and legitimacy of the laws (all measured on a scale of 1 – 5).

Groups	*Procedural justice*					*Police legitimacy*	*Laws legitimacy*
	Scale	*Trustworthiness*	*Respect*	*Voice*	*Neutrality*		
Drug drivers	2.50	3.00	2.00	2.00	3.00	3.00	3.33
Tested drug drivers	2.50	3.00	2.00	2.00	3.00	3.00	3.33
Never-tested drug drivers	2.75	3.00	2.00	2.00	3.00	3.00	3.67
Non-drug drivers	3.00	3.00	3.00	2.00	4.00	4.00	4.67
Drink drivers	3.00	4.00	3.00	2.00	4.00	3.67	4.67
Tested drink drivers	3.25	4.00	3.00	2.00	4.00	3.67	4.67
Never-tested drink drivers	3.00	3.00	3.00	2.00	3.00	4.00	4.67
Non-drink drivers	3.00	3.00	3.00	2.00	4.00	4.00	4.67

Table 4
Groups' perceptions of procedural justice, police legitimacy and legitimacy of laws.

	Compared to	Never-tested participants	Never-tested drug drivers	Never-tested drink drivers	RDT-tested non-drug drivers	RBT-tested non-drink drivers	RBT-tested drink drivers
Perceptions of Procedural Justice of	RDT-tested participants	*Lower*					
	RBT-tested participants	*Higher*					
	RDT-tested drug drivers		*No difference*		*Lower*		*Lower*
	RBT-tested drink drivers			*No difference*		*No difference*	
Perceptions of Police Legitimacy of	RDT-tested participants	*Lower*					
	RBT-tested participants	*No difference*					
	RDT-tested drug drivers		*No difference*		*Lower*		*Lower*
	RBT-tested drink drivers			*No difference*		*Lower*	
Perceptions of Legitimacy of Laws of	RDT-tested participants	*Lower*					
	RBT-tested participants	*Lower*					
	RDT-tested drug drivers		*Lower*		*Lower*		*Lower*
	RBT-tested drink drivers			*No difference*		*Lower*	

reported lower perceptions of police procedural justice regarding RDT than those who have never been tested ($U = 175842.5$, $p < 0.05$). The perceived legitimacy of police conducting drug driving enforcement was lower among RDT-tested participants compared with those who had never been tested ($U = 168222.5$, $p < 0.001$). The perceived legitimacy of drug driving laws was also significantly lower among RDT-tested participants ($U = 149759.0$, $p < 0.001$) compared to those who had never been tested by RDT.

RBT-tested participants reported higher levels of police procedural justice regarding RBT than those who have never been tested ($U = 113771.5$, $p < 0.001$), specifically in relation to respect ($U = 111138.0$, $p < 0.001$) and trustworthiness ($U = 107625.5$, $p < 0.001$). On the contrary, RBT-tested participants reported lower perceptions of the legitimacy of drink driving laws ($U = 126218.5$, $p < 0.05$) than those who had never been tested by RBT. No significant differences in the perceived legitimacy of police conducting drink driving enforcement were found between RBT-tested participants and those who have never been tested by RBT.

Among the self-reported drug drivers, no significant difference was found between those who had been tested by RDT and those who had not in relation to whether RDT was perceived as procedurally just. Similarly, there was no difference between the RDT-tested drug drivers and those who had not been tested in relation to whether police drug driving enforcement was perceived as legitimate. However, the RDT-tested drug drivers reported lower perceptions of the legitimacy of laws relating to drug driving compared to drug drivers who had never been tested ($U = 8000.0$, $p < 0.05$).

Compared to non-drug drivers who had been tested by the RDT, RDT-tested drug drivers reported significantly lower procedural justice perceptions relating to RDT ($U = 9450.0$, $p < 0.001$), with the elements of respect ($U = 10062.0$, $p < 0.01$) and neutrality ($U = 8622.0$, $p < 0.001$) being significantly lower among RDT-tested drug drivers. Also, lower perceptions of police legitimacy ($U = 7208.0$, $p < 0.001$) and legitimacy of drug driving laws ($U = 5054.0$, $p < 0.001$) were found among RDT-tested drug drivers than those of RDT-tested non-drug drivers.

Among the self-reported drink drivers, no significant differences in perceptions of procedural justice, police legitimacy, and legitimacy of laws related to drink driving were found between the RBT-tested drink drivers and drink drivers who had not been tested. Similarly, no significant differences in perceptions of procedural justice relating to RBT were found between RBT-tested drink drivers and RBT-tested non-drink drivers. However, the RBT-tested drink drivers reported lower perceptions of police legitimacy ($U = 161024.5$, $p < 0.001$) and legitimacy of drink driving laws ($U = 167084.5$, $p < 0.001$) compared to those of the non-drink drivers who had been tested by RBT.

The final group of analyses focused on those participants who reported engaging in drink or drug driving and having been tested by RDT or RBT, respectively. RDT-tested drug drivers had lower perceptions of procedural justice relating to RDT ($U = 17873.5$, $p < 0.001$) and all of its elements of respect ($U = 20035.5$, $p < 0.001$), voice ($U = 20550.5$, $p < 0.001$), neutrality ($U = 18393.5$, $p < 0.001$), and trustworthiness ($U = 18772.0$, $p < 0.001$) than the corresponding RBT perceptions of the RBT-

tested drink drivers. Furthermore, RDT-tested drug drivers reported lower perceptions of police legitimacy ($U = 15749.0$, $p < 0.001$) and legitimacy of laws ($U = 8670.5$, $p < 0.001$) relating to drug driving enforcement compared to the corresponding perceptions of the RBT-tested drink drivers.

3.3.5. Drug users vs. Non-drug users

To explore the potential impact of drug use on perceptions relating to drug driving enforcement, a set of analyses was undertaken comparing the self-reported drug users (not necessarily those who drive under the influence of drugs) with the remainder of the sample. The extent to which RDT was perceived as procedurally just was significantly lower among the drug users compared with other participants ($U = 185686.0$, $p < 0.001$). Furthermore, perceptions of the procedural justice elements of respect ($U = 203659.0$, $p < 0.001$), voice ($U = 200126.5$, $p < 0.001$), trustworthiness ($U = 207460.5$, $p < 0.001$), and neutrality ($U = 186717.0$, $p < 0.001$) were all significantly lower among drug users compared to non-drug users. Similarly, drug users had lower perceptions of police legitimacy ($U = 173497.5$, $p < 0.001$) and legitimacy of laws related to drug driving ($U = 151770.0$, $p < 0.001$) than non-drug users.

3.3.6. Gender and age analyses

Mann-Whitney U tests were conducted to explore whether the difference between gender/age groups affected the perceptions relating to drug driving enforcement. The Mann-Whitney U test showed that there was no statistically significant difference in overall perceptions of procedural justice of RDT between male and female participants, whereas younger participants (18–24 years old) reported lower perceptions of procedural justice ($U = 186662.5$, $p < 0.001$) than older adult participants (25+ years old). Perceptions of police legitimacy ($U = 238168.0$, $p < 0.01$) and legitimacy of laws related to drug driving ($U = 217531.5$, $p < 0.001$) were statistically significantly lower among males than females. Furthermore, perceptions of police legitimacy ($U = 208978.5$, $p < 0.01$) and legitimacy of laws related to drug driving ($U = 182103.5$, $p < 0.001$) were statistically significantly lower among older adult participants than younger participants. Table 5 summarizes these results.

3.4. Predictors of intentions to engage in drug or drink driving

The following analyses relate to Objective 3 of this study. Bivariate correlations between the independent variables and intentions to drive after taking drugs or alcohol are presented in Table A3 of the Appendix. Intentions to drug drive were moderately (i.e., $r < 0.7$) and positively correlated with drug dependence and negatively correlated with the legitimacy of laws relating to drug driving, while intentions to drink and drive were only moderately and positively correlated with alcohol dependence. Of the sociodemographic variables, age was moderately and positively correlated with driver's license type.

Hierarchical linear regression was used to test the effect of sociodemographic variables, substance dependence, experiences of enforcement, and perceptions of procedural justice, police legitimacy, and legitimacy of laws on intentions to engage in drink and drug driving (see Tables 6 and 7). Step 1 controlled for the effect of sociodemographic variables and substance dependence. Experiences of enforcement was then entered at Step 2, followed at Step 3 by the procedural justice, police legitimacy and legitimacy of laws perceptions.

Table 5
Perceptions of procedural justice, police legitimacy and legitimacy of laws according to gender and age.

	Compared to	Female	Adult
Perceptions of Procedural Justice of	Male	*No difference*	
	Young		*Lower*
Perceptions of Police Legitimacy of	Male	*Lower*	
	Young		*Higher*
Perceptions of Legitimacy of Laws of	Male	*Lower*	
	Young		*Higher*

3.4.1. Drug driving model

Step 1 of the regression was significant ($F(6, 1474) = 116.868$, $p < 0.001$) (see Table 6), accounting for 32.0% of the total variance in drug driving intentions. Gender, type of driver's license, hours of driving per week and drug dependence were significant predictors of intentions to drug drive, with a positive association between intentions and being male, holding an open/full driver's license, driving over 12 h per week and having high levels of drug dependence.

Experiences of enforcement were added to Step 2 of the regression. The regression was significant ($F(8, 1472) = 90.082$, $p < 0.001$) and accounted for 0.5% of additional variance in drug driving intentions compared to the Step 1 model. The sociodemographic variables from Step 1 remained significant in Step 2. The findings showed that a driver who reported being tested at least once by RDT for the presence of drugs had stronger intentions to drug drive ($p < 0.001$).

Step 3 of the regression included perceptions relating to the variables of procedural justice, police legitimacy, and legitimacy of the law. The model was significant ($F(11, 1469) = 101.624$, $p < 0.001$) and accounted for 10.3% of additional variance in drug driving intentions compared to the Step 2 model. Of the sociodemographic variables, only gender, hours of driving, and drug dependence remained significant. Being tested for drugs by RDT also remained a significant predictor of drug driving intentions ($p < 0.05$). Police legitimacy ($p < 0.01$) and the legitimacy of the law ($p < 0.001$) were found to be significant predictors, with individuals reporting lower perceptions of the legitimacy of laws and the legitimacy of police exhibiting stronger intentions to drug drive.

3.4.2. Drink driving model

Step 1 of the regression was significant ($F(6, 1474) = 70.289$, $p < 0.001$) (see Table 7), accounting for 21.9% of the total variance in drink driving intentions. A positive association was found between intentions to drink drive and being male, younger age, holding an open/full driver's license, driving over 12 h per week, and having high levels of alcohol dependence.

Experiences of RBT enforcement was added to Step 2 of the regression. The regression was significant ($F(8, 1472) = 52.815$, $p < 0.001$) with no additional variance in drink driving intentions compared to the Step 1 model. The variables from Step 1 remained significant in Step 2, but experiences of seeing police conducting RBT or being breath tested were not significant.

Step 3 included variables assessing perceptions related to procedural justice, police legitimacy, and legitimacy of the law. The model was significant ($F(11, 1469) = 43.156$, $p < 0.001$) and accounted for 2% of additional variance in drink driving intentions compared to the Step 2 model. Police legitimacy ($p < 0.01$) and the legitimacy of the law ($p < 0.001$) were significant predictors, with individuals reporting lower perceptions of the legitimacy of drink driving laws and police enforcement exhibiting stronger intentions to drink drive. The remaining significant variables were age, gender, type of driver's license, hours of driving per week, and alcohol dependence.

3.4.3. Testing for mediation effect

Multiple regression analyses were conducted to assess the nature of the relationships between the three enforcement-related perception variables and intentions to engage in drug or drink driving, respectively. The analyses indicated significant positive associations ($p < 0.001$) between intentions to drug/drink drive and each of the three variables in the proposed mediation model. Therefore, mediation analyses to test the indirect effects were conducted using the bootstrapping method. The findings confirmed the mediation role of perceived police legitimacy ($\beta = -0.1412$, 95% CI [-0.1735, −0.1108]) and the perceived legitimacy of laws relating to drug driving ($\beta = -0.1087$, 95% CI [-0.1422, −0.0787]) in the relationship between the perception of procedural justice regarding RDT and intentions to drug drive. This indicates that the

Table 6
Hierarchical linear regression model for the effect of perceptions of procedural justice, police legitimacy and legitimacy of laws on intentions to drug drive.

Variable	Model 1			Model 2			Model 3		
	B	Std.	β	B	Std.	β	B	Std.	β
Step 1									
(Constant)	0.665***	0.111		0.596***	0.115		2.631***	0.165	
Age	0.001	0.002	0.015	0.001	0.002	0.017	0.001	0.001	0.014
Gender	−0.193***	0.042	−0.103	−0.172***	0.042	−0.092	−0.129**	0.039	−0.069
Income per year	0.014	0.030	0.011	0.012	0.030	0.009	0.006	0.027	0.005
Driver's license	0.168**	0.060	0.076	0.149*	0.060	0.067	0.056	0.056	0.025
Hours of driving per week	0.159***	0.042	0.082	0.144***	0.042	0.074	0.096*	0.039	0.050
Drugs dependence	0.479***	0.020	0.531	0.467***	0.020	0.518	0.332***	0.020	0.369
Step 2									
Seeing RDT				0.051	0.049	0.023	0.060	0.046	0.027
Tested for drugs				0.167***	0.050	0.075	0.108*	0.046	0.049
Step 3									
Procedural Justice							−0.002	0.021	−0.003
Police Legitimacy							−0.070**	0.024	−0.074
Legitimacy of Laws							−0.357***	0.026	−0.323
R^2			0.322***			0.329***			0.432***
Adjusted R^2			0.320			0.325			0.428
R^2 change			0.322			0.006			0.103
F change			116.868***			6.913**			89.215***
Df			6			2			3

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

Table 7
Hierarchical linear regression model for the effect of perceptions of procedural justice, police legitimacy and legitimacy of laws on intentions to drink drive.

Variable	Model 1			Model 2			Model 3		
	B	Std.	B	B	Std.	β	B	Std.	β
Step 1									
(Constant)	0.781***	0.155		0.683***	0.203		1.814***	0.282	
Age	−0.005**	0.002	−0.077	−0.005**	0.002	−0.081	−0.005*	0.002	−0.070
Gender	−0.362***	0.054	−0.160	−0.358***	0.054	−0.158	−0.328***	0.054	−0.145
Income per year	0.057	0.038	0.036	0.056	0.039	0.035	0.052	0.038	0.032
Driver's license	0.798***	0.078	0.298	0.775***	0.082	0.289	0.733***	0.082	0.274
Hours of driving per week	0.198***	0.055	0.084	0.194***	0.055	0.083	0.174**	0.054	0.074
Alcohol dependence	0.424***	0.034	0.289	0.422***	0.034	0.288	0.411***	0.034	0.280
Step 2									
Seeing RBT				0.072	0.149	0.012	0.129	0.148	0.021
Tested for Alcohol				0.066	0.085	0.021	0.037	0.084	0.012
Step 3									
Procedural Justice							0.054	0.029	0.048
Police Legitimacy							−0.089**	0.032	−0.075
Legitimacy of Laws							−0.221***	0.046	−0.116
R^2			0.222***			0.223***			0.244***
Adjusted R^2			0.219			0.219			0.239
R^2 change			0.222			0.001			0.021
F change			70.289***			0.528			13.743***
df			6			2			3

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

influence of procedural justice perceptions related to RDT on intentions to drug drive was fully mediated by the two legitimacy-related perception variables. Similarly, a mediation role of perceived police legitimacy (β = -0.0894, 95% CI [-0.1207, −0.0605]) and the perceived legitimacy of laws relating to drink driving (β = -0.0279, 95% CI [-0.0443, −0.0144]) was found for the relationship between the perceptions of procedural justice regarding RBT and intentions to drink drive.

4. Discussion

This study investigated and compared the extent to which different groups of drivers perceive RDT and RBT operations to be procedurally just and consider the policing of drug/drink driving and the associated laws to be legitimate (Objectives 1 and 2). It also examined whether drivers' perceptions of procedural justice regarding both RDT and RBT, police legitimacy, and the legitimacy of laws relating to drug/drink driving influence their intentions to engage in drug or drink driving (Objective 3). Overall, this study found that lower perceptions of police legitimacy and the legitimacy of related laws were positively associated with intentions to both drug drive and drink drive in the future, and that this was over and above the influence of having previously been tested for drugs or alcohol, respectively. Based on a comparison of the relevant coefficients in the two regression models, the perceived legitimacy of the police and related laws appears to have a stronger influence on intentions to drug drive than on intentions to drink drive.

4.1. Drug and drink driving enforcement-related perceptions

Ultimately, RDT operations in Australia aim to detect and punish offending drug drivers in order to deter them from committing a future offense (i.e., specific deterrence), as well as deter the general driving population from drug driving (i.e., general deterrence) (Davey et al., 2017). This study showed that the deterrent effect of RDT operations could be undermined by the nature of the encounter, as lower perceptions of procedural justice regarding RDT were reported among those participants who had been tested in the past, had engaged in drug driving (regardless of whether they had been tested or not), and were drug users. Furthermore, the age-related analyses showed that the younger participants perceived RDT to be less procedurally just than the older adult participants. This suggests that drivers may find difficulties in attempting to communicate with police officers, and police officers exercise their authority without fully considering the motives of respect and neutrality (Bates et al., 2015). In this regard, RDT-tested drug drivers reported lower perceptions of being treated neutrally and with respect by police officers than those non-drug drivers who had been tested. This, in turn, may lead some drug drivers to reoffend by continuing to drive after using drugs in the future (Wilson, 2011). However, given the cross-sectional nature of this study, it is not possible to conclude that it is exposure to RDT that affects perceptions of procedural justice. Instead, it may be that the findings reflect the particular characteristics of those people who are more likely to be tested at RDT. Indeed, drug drivers in this study sample reported being tested by RDT more often than non-drug drivers.

The extent to which RDT was perceived as procedurally just also differed in comparison to RBT. For instance, although modelled on RBT, RDT was perceived as less procedurally just than RBT. In this regard, regardless of whether they were tested or not, the study showed that drug drivers reported lower perceptions of procedural justice for RDT than the drink drivers did for RBT. Interestingly, drink drivers with full driver's licenses reported higher perceptions of procedural justice regarding RBT than those drink drivers holding a provisional/probationary driver's license (who were thus subject to a zero BAC limit), as well as the drug drivers regarding RDT. While this pattern of results may be indicative of concerns about the way RDT is operated, it may also reflect the way in which drink driving was operationalized in this study (i.e., driving within an hour of consuming alcohol). Whereas those participants holding provisional/probationary licenses who reported driving within an hour of consuming alcohol were most likely driving illegally, those full license holders who consumed only small amounts of alcohol may have considered themselves to be under the limit and thus driving legally. As such, compared with both those fully licensed drivers who consumed larger amounts of alcohol prior to driving and those who drive after taking drugs, the low alcohol consumption drivers may have been more likely to perceive RBT as procedurally just since they know that it is conducted in a way to ensure that drivers are not punished if their BAC level is below 0.05. In other words, they may be aware that the police use accurate breath testing equipment and follow strict procedures to ensure that it is only drivers above 0.05 who are detected. Therefore, it is possible that including the low alcohol consumption drivers in the drink driving group may have served to 'mask' the extent to which the fully licensed drink drivers perceived RBT to be procedurally unjust and illegitimate, both in general and in comparison with drug drivers and their corresponding perceptions to RDT. In addition, it is possible that this 'masking' effect may have contributed to the drink drivers (regardless of the type of driver's license) being more likely to perceive policing and related laws as being more legitimate than the drug drivers did. However, this seems less likely given that perceptions relating to the legitimacy of drink driving policing and laws were significantly lower among the fully licensed drink drivers compared to their non drink driving counterparts. Furthermore, there was no significant difference in these perceptions between the provisional/probationary licensed drink drivers and the fully licensed drink drivers.

When only considering those participants who had been tested, the RBT-tested *drink drivers* reported higher ratings on all procedural justice components of respect, voice, neutrality, and trustworthiness relating to RBT than those of the RDT-tested drug drivers relating to RDT. Moreover, RBT-tested *participants* reported higher levels of respect and trustworthiness with regard to RBT than those who had never been tested. While one explanation is that the interaction between police officers and drivers at RDT sites differs from that at RBT sites, which could lead to these perceptions, another is that the random nature of RBT is seen as more fair than the RDT process. The tendency for police to undertake targeted RDT testing is mainly due to the additional resources required to conduct RDT compared with the more widely performed RBT (Love et al., 2022). The lower level of RDT operations was confirmed by the findings of this study, as only 22.5% of the sample reported having been tested at least once by an RDT, while 85% had been tested at least once by an RBT.

Consistent with previous research (Watling & Freeman, 2011; Wilson, 2011), this study indicated that the perceived legitimacy of police conducting drug driving enforcement and the perceived legitimacy of drug driving laws were significantly lower among those who reported using drugs in general, as well as those who drove after using drugs. Moreover, these perceptions were lower than the corresponding ones for those who reported drink driving. In addition, lower perceptions of police legitimacy and the legitimacy of drug driving laws were reported by males and older adult participants. These weak perceptions may negate the deterrent effect of drug driving enforcement and lead to lower levels of compliance and cooperation. Moreover, many of the drug drivers who continue to offend may believe that drugs do not impair their driving ability but rather improve it, and thus, they consider drug driving laws to be irrelevant to themselves (Hasan et al., 2022).

4.2. The relationship between enforcement-related perceptions and intentions to drug and drink drive

Lower perceptions of police legitimacy and the legitimacy of laws were significant predictors of future intentions to engage in both drug driving and drink driving. However, the effect size was larger for drug driving when compared with drink driving. One reason for this is that some drivers question the validity of RDT and view the *zero-tolerance* laws that are based on the presence of drugs rather than impairment as unjust (Hasan et al., 2022; Love et al., 2022; Wilson, 2011). This conclusion was further reinforced by the fact that having been tested for drugs at least once in the past remained a predictor of future intentions to drug drive in the final regression model. This suggests that exposure to RDT enforcement may inadvertently encourage some drivers to engage in drug driving in the future, which is consistent with road safety research on other illegal behaviors (Bates et al., 2017; Pogarsky & Piquero, 2003; Watson, 2004). Previous research has referred to this as the 'emboldening effect' (Piquero & Pogarsky, 2002), where exposure to enforcement may encourage future offending rather than deter it. This effect may apply to participants who were detected at RDT and were subsequently punished without perceiving the punishment to be particularly severe. An emboldening effect may also occur among those who passed the RDT without experiencing any punishment, particularly if they had another type of drug in their system that is not tested for at RDT. However, it is possible that the findings relating to RDT do not represent an 'emboldening effect,' but simply reflect the past experiences of drug drivers and the tendency of the police to conduct RDT at particular times and places. In other words, it is possible that those who had drug driven in the past were not only more likely to have encountered RDT, but also more likely to intend to drug drive in the future.

While procedural justice did not appear to be a significant predictor of intentions to either drug drive or drink drive, further analysis identified that the two legitimacy items fully mediated the relationship between procedural justice and these intentions. Thus, it can be argued that procedural justice perceptions are critical in influencing drivers'

perceptions of the legitimacy of both enforcement and related laws and, thus indirectly impact on driving intentions. Given that prior research has shown that police are able to use procedural justice as an effective intervention (Bates et al., 2023; MacQueen & Bradford, 2015; Sahin et al., 2017), officers should be encouraged to engage in meaningful and procedurally just interactions at RDT and RBT as this can have an indirect effect on intentions to drug and drink drive.

4.3. Study implications

This study has important implications for the enforcement-based countermeasures targeting drug and drink driving. It has shown that perceptions of the legitimacy of police and related laws influence intentions to drug and drink drive. While public education is necessary to explain the purpose of police enforcement of drug driving and related laws, especially for younger drivers, authorities need to consider changes to the laws targeting drug driving that will positively impact on people's perceptions of legitimacy. For instance, modifying the current approach to include specific levels of drugs chosen based on the dose–response relationship that would increase the crash risk may be seen as more just. Furthermore, these perceptions of legitimacy could be improved by enhancing the perceived procedural justice of RDT. Thus, police agencies should focus on ensuring that all interactions with drivers, but particularly those at RDT and RBT sites, are conducted according to the principles of procedural justice. Specifically, it may be worth modifying RDT to encourage more positive interactions with the police, as has been found in the case of RBT (Mazerolle et al., 2012) or requiring police officers to wear body worn cameras as this enhances drivers perceptions of procedural justice (Demir & Kule, 2022).

One of the key principles of procedural justice is neutrality (Bates et al., 2016; Murphy et al., 2014). However, there is evidence that police officers are more likely to test drivers with certain characteristics (e.g., personal appearance, behavioral cues, prior criminal history), which may indicate a police bias when intercepting drivers (Anderson et al., 2021) and thus undermine perceptions of procedural justice. Therefore, there is a need to increase the actual neutrality of police operations, which in turn will enable the use of procedural justice as an effective intervention and will enhance a culture of accountability and trust between police forces and the community. Police officers may also need to include a statement when undertaking an RDT that enhances perceptions of neutrality. One example is: *'Today, we are conducting a roadside drug test on a small number of drivers who have also completed a random breath test. You have been chosen to complete this additional test.*' This implies that all drivers had the chance to be chosen to undertake the RDT. Given there are fewer RDTs when compared with RBTs (Love et al., 2022), efforts to increase exposure to RDT tests should continue (Anderson et al., 2021; Cameron et al., 2022). This may also help improve perceptions of neutrality.

Both drug and alcohol dependence were positively associated with intentions to drug and drink drive in the future. This highlights the importance of further implementation of approaches to address substance abuse and addiction (Castro et al., 2023; Hasan et al., 2023; Mills, Freeman, et al., 2022). Accordingly, addiction treatment programs designed for drug and drink driving offenders may be more useful than enforcement in reducing future engagement in these behaviors. In addition, dedicated drug driving rehabilitation programs for those detected drug driving need to be explored and evaluated, given that these have been successfully applied to drink driving offenders (Salmon et al., 2020).

4.4. Strengths and limitations

To our knowledge, this is the first study to investigate perceptions of procedural justice in combination with police legitimacy and legitimacy of laws among different groups of drivers, and how these perceptions influence intentions to both drug drive and drink drive in the future. However, the limitations of this study must be acknowledged. First, the items measuring the legitimacy of laws for drink driving exhibited a relatively low internal consistency (Cronbach's alpha = 0.65). This could be attributed to the complexity of measuring such phenomena as legitimacy and trust, given the variance in interpretations of what is fair and legitimate among individuals. Second, this study used self-report data for the measures, which may be affected by self-presentation biases. Third, the way in which self-reported drink driving and intentions to drink drive in the future were measured was adopted for the purpose of comparison with drug driving, but does not necessarily imply illegal drink driving. In this regard, among the full license holders in the study, there might have been differences in the perceptions of those who drove after only consuming small amounts of alcohol and those who consumed sufficient amounts to put them over the legal alcohol limit. As already noted, compared with both drug drivers and drink drivers who are prepared to drive over the limit, perhaps those drivers who consume only small amounts of alcohol before driving are likely to have higher perceptions of procedural justice since they know that RBT is conducted in a way to ensure that drivers are not punished if their BAC level is below 0.05. Therefore, it is possible that including the low alcohol consumption drivers in the drink driving group may have served to 'mask' the extent to which the fully licensed drink drivers perceived RBT to be not procedurally just or legitimate. However, this 'masking' effect appeared to be less evident in relation to the perceived legitimacy of drink driving policing and laws. Finally, the study showed that neither being tested through RDT nor observing police conducting RDT appears to have a deterrent effect on the behavior. However, due to the correlational nature of this research, it is unclear whether the findings primarily reflect the inadequacy of RDT to act as a deterrent or the tendency for drug drivers to drive at the same times and places where RDT is conducted.

5. Conclusions

This study adds to our understanding of drug and drink driving enforcement and has demonstrated that perceptions of the legitimacy of police conducting RDT and RBT operations and the legitimacy of related laws mediate the relationship between procedural justice and drink/drug driving. While this effect is larger for drug driving than for drink driving, it is important that opportunities to incorporate procedurally just interactions between drivers and police officers are created. Changes to current policing practices and/or to the drug driving laws may be required to enhance the effectiveness of drug driving enforcement. Coupling this with other interventions, such as rehabilitation programs and public education about the purpose of police practices and related laws, should reduce the incidence of drug and drink driving and associated injuries and fatalities. These interventions should target those who question the legitimacy of legal authorities and relevant rules, as they are more likely to break the law and thus threaten the safety of road users. Future research conducting field investigations into the impact of one-on-one police-driver encounters at RDT operations and evaluating its effectiveness in deterring drug driving is needed to inform the decision-making of road safety authorities.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Table A1
Independent variables included in the regressions and other analyses.

Variable	Measurement type	Scale
Age	Continuous	Digits
Gender	Nominal	(1) Male (Ref) (2) Female + Other
Income per year	Nominal	(1) Did not state (Ref) (2) Low income (3) Middle & High income
Driver's license	Dichotomous	(1) Provisional/ Probationary (Ref) (2) Open/ Full/ Foreign driver's license
Hours of driving per week	Dichotomous	(1) Below median (Ref) (2) Over median
Alcohol dependence	Nominal	(1) Not measured (Ref) (2) Non-consumers (3) Low (4) Medium (5) High
Drug dependence	Nominal	(1) Not measured (Ref) (2) Non-consumers (3) Low (4) Medium (5) High
PJ and Legitimacy variables	Various	Various
Seeing police operating RBT	Dichotomous	(1) Never seen (Ref) (2) Seen
Seeing police operating RDT	Dichotomous	(1) Never seen (Ref) (2) Seen
Being breath tested	Dichotomous	(1) Never been tested (Ref) (2) Tested
Being drug tested	Dichotomous	(1) Never been tested (Ref) (2) Tested

Table A2
Means, standard deviations and Cronbach's reliability coefficients of scales (N = 1,483).

Construct (variable)	Number of items measuring the construct	Cronbach's alpha	Mean (M)	Standard deviations (SD)
Intentions to drug drive	3	0.939	1.401	0.923
Intentions to drink drive	3	0.928	1.818	1.117
Drug driving related constructs				
Trustworthiness	1	–	3.13	1.232
Respect	1	–	2.96	1.224
Voice	1	–	2.42	1.154
Neutrality	1	–	3.27	1.301
Procedural Justice (All four components)	4	0.865	2.94	1.037
Confidence in Police	1	–	3.25	1.216
Police do their job well	1	–	3.89	1.131
Respect the Police	1	–	3.57	1.259
Perceptions of Police legitimacy (All three components)	3	0.750	3.57	0.982
Individual's feelings about right agree with law	1	–	4.20	1.181
People should do what law says	1	–	4.38	0.937
Law consistency with community values	1	–	4.15	0.911
Perceptions of the legitimacy of law (All three components)	3	0.767	4.24	0.839
Drink driving related constructs				
Trustworthiness	1	–	3.29	1.164
Respect	1	–	3.09	1.175
Voice	1	–	2.53	1.162
Neutrality	1	–	3.36	1.252

(*continued on next page*)

Table A2 (*continued*)

Construct (variable)	Number of items measuring the construct	Cronbach's alpha	Mean (M)	Standard deviations (SD)
Procedural Justice (All four components)	4	0.858	3.07	0.995
Confidence in Police	1	–	3.51	1.202
Police do their job well	1	–	4.04	1.032
Respect the Police	1	–	3.63	1.230
Perceptions of Police legitimacy (All three components)	3	0.733	3.73	0.935
Individual's feelings about right agree with law	1	–	4.57	0.808
People should do what law says	1	–	4.64	0.656
Law consistency with community values	1	–	4.28	0.822
Perceptions of the legitimacy of law (All three components)	3	0.650	4.49	0.587

Table A3
Correlation matrix of dependent and independent variables (Page 1).

Variable		1	2	3	4	5	6	7	8	9	10
Intentions (drug driving)	1	1	0.253**	0.095**	0.090**	−0.195**	0.112**	0.077**	0.537**	0.019	0.026
Intentions (drink driving)	2		1	0.220**	0.296**	−0.239**	0.127**	0.161**	0.115**	0.303**	0.055*
Age	3			1	0.578**	−0.183**	0.076**	0.104**	−0.193**	−0.114**	0.148**
Driver's license	4				1	−0.191**	0.103**	0.251**	−0.047	−0.018	0.136**
Gender	5					1	−0.140**	−0.173**	−0.117**	−0.060*	−0.033
Hours of driving per week	6						1	0.071**	0.009	−0.027	0.032
Income per year	7							1	0.042	0.085**	0.003
Drugs dependence	8								1	0.178**	−0.026
Alcohol dependence	9									1	0.010
Operating Random Breath Testing (RBT)	10										1
Operating Roadside Drug Testing (RDT)	11										
Breath tested	12										
Drug tested	13										
Procedural Justice (drug driving)	14										
Procedural Justice (drink driving)	15										
Police legitimacy (drug driving)	16										
Police legitimacy (drink driving)	17										
Legitimacy of law (drug driving)	18										
Legitimacy of law (drink driving)	19										

** *Correlation is significant at the 0.01 level.*
* *Correlation is significant at the 0.05 level.*

Table A3
Correlation matrix of dependent and independent variables (Page 2).

Variable		11	12	13	14	15	16	17	18	19
Intentions (drug driving)	1	0.079**	0.131**	0.208**	−0.199**	−0.211**	−0.343**	−0.212**	−0.537**	−0.213**
Intentions (drink driving)	2	−0.025	0.186**	0.139**	−0.024	0.015	−0.157**	−0.149**	−0.179**	−0.182**
Age	3	0.103**	0.376**	0.016	0.281**	0.277**	0.067**	0.093**	−0.031	0.036
Driver's license	4	0.059*	0.478**	0.123**	0.085**	0.108**	−0.086**	−0.071**	−0.128**	−0.050
Gender	5	−0.041	−0.205**	−0.197**	−0.051	−0.078**	0.089**	0.051	0.161**	0.093**
Hours of driving per week	6	0.032	0.130**	0.130**	0.015	−0.002	−0.066*	−0.061*	−0.099**	−0.065*
Income per year	7	−0.036	0.174**	0.101**	0.003	0.013	−0.073**	−0.063**	−0.075**	−0.041
Drugs dependence	8	0.057*	0.022	0.175**	−0.256**	−0.247**	−0.291**	−0.182**	−0.411**	−0.115**
Alcohol dependence	9	−0.033	0.016	0.028	−0.069**	−0.042	−0.042	−0.075**	−0.032	−0.054*
Operating Random Breath Testing (RBT)	10	0.327**	0.259**	0.054*	0.044	0.057*	0.050	0.072**	−0.001	0.025
Operating Roadside Drug Testing (RDT)	11	1	0.116**	0.194**	0.048	0.050	0.067*	0.087**	−0.060*	0.023
Breath tested	12		1	0.223**	0.107**	0.119**	−0.065*	−0.033	−0.115**	−0.056*
Drug tested	13			1	−0.053*	−0.060*	−0.103**	−0.075**	−0.177**	−0.104**
Procedural Justice (drug driving)	14				1	0.887**	0.492**	0.417**	0.235**	0.122**
Procedural Justice (drink driving)	15					1	0.463**	0.422**	0.246**	0.133**
Police legitimacy (drug driving)	16						1	0.842**	0.458**	0.259**
Police legitimacy (drink driving)	17							1	0.330**	0.310**
Legitimacy of law (drug driving)	18								1	0.542**
Legitimacy of law (drink driving)	19									1

** *Correlation is significant at the 0.01 level.*
* *Correlation is significant at the 0.05 level.*

References

Anderson, L., Love, S., Freeman, J., & Davey, J. (2021). Hit and miss: A comparison of targeted and randomised roadside drug testing (RDT). *Policing: An International Journal, 44*(6), 1154–1167.

Armstrong, K., Watling, C., & Davey, J. (2018). Deterrence of drug driving: The impact of the ACT drug driving legislation and detection techniques. *Transportation Research Part F: Traffic Psychology Behavior., 54*, 138–147. https://doi.org/10.1016/j.trf.2018.01.014

Barkworth, J. M., & Murphy, K. (2015). Procedural justice policing and citizen compliance behavior: The importance of emotion. *Psychology, Crime & Law., 21*(3), 254–273. https://doi.org/10.1080/1068316X.2014.951649

Bates, L. (2014). Procedural justice and road policing: Is it important. Australasian Road Safety Research. Melbourne, Australia: Policing and Education Conference. Retrieved from https://research-repository. griffith. edu. au/bitstream/handle/10072/67711/99597_1. pdf.

Bates, L., Allen, S., & Watson, B. (2016). The influence of the elements of procedural justice and speed camera enforcement on young novice driver self-reported speeding. *Accident Analysis & Prevention, 92*, 34–42. https://doi.org/10.1016/j.aap.2016.03.023

Bates, L., Anderson, L., & McLean, R. (2021). Exploring young drivers' perceptions of procedurally just policing. *Policing: A Journal of Policy and Practice., 15*(3), 1933–1947. https://academic.oup.com/policing/article/15/3/1933/6189014.

Bates, L., Antrobus, E., Bennett, S., & Martin, P. (2015). Comparing police and public perceptions of a routine traffic encounter. *Police Quarterly., 18*(4), 442–468.

Bates, L., Bennett, S., Irvine, C., Antrobus, E., & Gilmour, J. (2023). A procedurally just flyer reduces subsequent speeding offenses: Evidence from the Queensland Speeding Engagement Trial (QSET). *Journal of Experimental Criminology In Press.*

Bates, L., Darvell, M. J., & Watson, B. (2017). Young and unaffected by road policing strategies: Using deterrence theory to explain provisional drivers'(non) compliance. *Australian & New Zealand journal of criminology, 50*(1), 23–38.

Bates, L., Hassan, E. H., Soderlind, D., & McLean, R. (2022). Does procedural justice predict intentions to speed? Evidence from a sample of young drivers. *Transportation Research Interdisciplinary Perspectives, 16*, Article 100709. https://doi.org/10.1016/j.trip.2022.100709

Bates, L., Soole, D., & Watson, B. (2012). The effectiveness of traffic policing in reducing traffic crashes. *Policing and Security in Practice., 90–109*. https://doi.org/10.1057/9781137007780_6

Bennett, S., Mazerolle, L., Antrobus, E., Martin, P., & Hine, L. (2019). *The trials and tribulations of evidence based procedural justice* (pp. 145–160). Evidence based policing: An introduction.

Bureau of Infrastructure Transport and Regional Economics (BITRE). (2021). *Yearbook 2021: Australian Infrastructure and Transport Statistics, Statistical Report*. https://www.bitre.gov.au/sites/default/files/documents/Bitre-yearbook-2021.pdf.

Bureau of Infrastructure Transport Regional Economics (BITRE). (2022). *Data provided by Bureau of Infrastructure, Transport and Regional Economics*. https://app.powerbi.com/view?r=eyJrIjoiZTAxY2EyOTAtYTdhMS00NTRiLWI0NDktM2U1ZDI0NzY0ZTU5IiwidCI6ImFhMjFiNjQwLWJhYzItNDU2ZC04NTA1LWYyY2MwN2Y1MTc4NCJ9.

Cameron, M. (2013). Random drug testing in Australia, analogies with RBT, and likely effects with increased intensity levels. Proceedings, 20th International Conference on Alcohol, Drugs and Traffic Safety, Brisbane.

Cameron, M., Newstead, S., Clark, B., & Thompson, L. (2022). Evaluation of an increase in roadside drug testing in Victoria based on models of the crash effects of random and targeted roadside tests. *Journal of road safety, 33*(2), 17–32.

Castro, C., Doncel, P., Dinu, A. I., & Padilla, F. (2023). Strong predictors of offender drivers: Drug and alcohol addiction and the inability to dissociate binge alcohol or drug consumption from driving. Revoking their driver's license may not be enough. *Transportation Research Part F: Traffic Psychology and Behavior., 92*, 337–352. https://doi.org/10.1016/j.trf.2022.12.002

Cherney, A., & Murphy, K. (2013). Policing terrorism with procedural justice: The role of police legitimacy and law legitimacy. *Australian & New Zealand Journal of Criminology., 46*(3), 403–421.

Cuttler, C., Sexton, M., & Mischley, L. K. (2018). Driving under the influence of cannabis: An examination of driving beliefs and practices of medical and recreational cannabis users across the United States. *Cannabis, 1*(2), 1-13. 10.26828/cannabis.2018.02.001.

Davey, J., Armstrong, K., Freeman, J., & Sheldrake, M. (2017). Roadside drug testing scoping study.

Demir, M., & Kule, A. (2022). The effect of body-worn cameras on satisfaction and general perceptions of police: Findings from a quasi-randomized controlled trial. *European Journal of Criminology, 19*(4), 562–585.

Ferris, J., Mazerolle, L., King, M., Bates, L., Bennett, S., & Devaney, M. (2013). Random breath testing in Queensland and Western Australia: Examination of how the random breath testing rate influences alcohol related traffic crash rates. *Accident Analysis & Prevention, 60*, 181–188.

Freeman, J., Armstrong, K., Truelove, V., & Szogi, E. (2015). Left on the side of the road? A review of deterrence-based theoretical developments in road safety. 2015 Australasian Road Safety Conference, 14-16 October, Gold Coast, Australia.

Freeman, J., Parkes, A., Mills, L., Truelove, V., & Davey, J. (2021). A study identifying the origins of different types of drink driving events through the lens of deterrence: Is it alcohol abuse or avoiding detection? *Transportation research part F: Traffic psychology and behavior, 79*, 157–169.

Goldenbeld, C., Torfs, K., Vlakveld, W., & Houwing, S. (2020). Impaired driving due to alcohol or drugs: International differences and determinants based on E-Survey of Road Users' Attitudes first-wave results in 32 countries [Web]. *IATSS Research, 44*(3), 188–196. https://doi.org/10.1016/j.iatssr.2020.07.005

Goodman-Delahunty, J. (2010). Four ingredients: New recipes for procedural justice in Australian policing. *Policing: A Journal of Policy and Practice., 4*(4), 403–410. https://doi.org/10.1093/police/paq041

Hamm, J. A., Trinkner, R., & Carr, J. D. (2017). Fair process, trust, and cooperation: Moving toward an integrated framework of police legitimacy. *Criminal Justice and Behavior., 44*(9), 1183–1212. https://doi.org/10.1177/0093854817710058

Hasan, R., Watson, B., Haworth, N., & Oviedo-Trespalacios, O. (2022). A systematic review of factors associated with illegal drug driving. *Accident Analysis & Prevention, 168, Article e106574*. https://doi.org/10.1016/j.aap.2022.106574

Hasan, R., Watson, B., Haworth, N., & Oviedo-Trespalacios, O. (2023). What contributes to drug driving? An exploratory investigation into the influence of problematic substance use, roadside testing and alternative transport options. *Accident Analysis & Prevention, 184, Article e106990*. https://doi.org/10.1016/j.aap.2023.106990

Hayes, A. F. (2017). Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. Guilford publications.

Hertogh, M. (2015). What moves Joe Driver? How perceptions of legitimacy shape regulatory compliance among Dutch traffic offenders. *International Journal of Law, Crime and Justice., 43*(2), 214–234. https://doi.org/10.1016/j.ijlcj.2014.09.001

Hinds, L., & Murphy, K. (2007). Public satisfaction with police: Using procedural justice to improve police legitimacy. *Australian & New Zealand Journal of Criminology., 40*(1), 27–42.

Income, H., & Wealth, A. (2022). Key information from the Survey of Income and Housing 2019–20 including distribution of income and wealth by various household characteristics. Retrieved from https://www.abs.gov.au/statistics/economy/finance/household-income-and-wealth-australia/latest-release.

Humeniuk, R., Ali, R., Babor, T. F., Farrell, M., Formigoni, M. L., Jittiwutikarn, J., De Lacerda, R. B., Ling, W., Marsden, J., & Monteiro, M. (2008). Validation of the alcohol, smoking and substance involvement screening test (ASSIST). *Addiction, 103*(6), 1039–1047. https://doi.org/10.1111/j.1360-0443.2007.02114.x

Humeniuk, R., Henry-Edwards, S., Ali, R., Poznyak, V., Monteiro, M. G., & Organization, W. H. (2010). The Alcohol, Smoking and Substance involvement Screening Test (ASSIST): manual for use in primary care.

Humeniuk, R., & Holmwood, C. (2011). Developing The eAssist: The Alcohol, Smoking and Substance Involvement Screening Test Questionnaire in Electronic Format For Australian Clinicians. *Drug and Alcohol Review, 30*, 41–42. https://onlinelibrary.wiley.com/toc/14653362/2023/42/2.

Kim, Y. S., Ra, K. H., & McLean, K. (2019). The generalizability of police legitimacy: Procedural justice, legitimacy, and speeding intention of South Korean drivers. *Asian journal of criminology, 14*, 41–59.

Love, S., Rowland, B., Stefanidis, K. B., & Davey, J. (2022). Are Current Drug Driving Enforcement Strategies Achieving the Desired Effect? Drug Users' Perceptions of Drug Driving Legislation and Enforcement in Queensland. *Journal of Police and Criminal Psychology, 1–14*. https://doi.org/10.1007/s11896-022-09542-6

MacQueen, S., & Bradford, B. (2015). Enhancing public trust and police legitimacy during road traffic encounters: Results from a randomised controlled trial in Scotland. *Journal of experimental criminology, 11*, 419–443.

Madon, N. S., Murphy, K., & Williamson, H. (2022). Justice is in the eye of the beholder: A vignette study linking procedural justice and stigma to Muslims' trust in police. *Journal of experimental criminology*, 1–23.

Mazerolle, L., Antrobus, E., Bennett, S., & Tyler, T. R. (2013). Shaping citizen perceptions of police legitimacy: A randomized field trial of procedural justice. *Criminology, 51*(1), 33–63.

Mazerolle, L., Bates, L., Bennett, S., White, G., Ferris, J., & Antrobus, E. (2015). Optimising the length of random breath tests: Results from the Queensland Community Engagement Trial. *Australian & New Zealand Journal of Criminology., 48*(2), 256–276.

Mazerolle, L., Bennett, S., Antrobus, E., & Eggins, E. (2012). Procedural justice, routine encounters and citizen perceptions of police: Main findings from the Queensland Community Engagement Trial (QCET). *Journal of Experimental Criminology., 8*(4), 343–367. https://doi.org/10.1007/s11292-012-9160-1

Mills, L., Freeman, J., Parkes, A., & Davey, J. (2022). Do they need to be tested to be deterred? Exploring the impact of exposure to roadside drug testing on drug driving. *Journal of Safety Research., 80*, 362–370. https://doi.org/10.1016/j.jsr.2021.12.017

Mills, L., & Truelove, V. (2024). Is drug driving more common among those who know where the police are? An investigation into the use and non-use of Facebook police location communities. *Safety science, 169*, Article 106338.

Mills, L., Truelove, V., & Freeman, J. (2022). Is the Unsafe Becoming Undetectable? A Content Analysis of Facebook Sites that Reveal Roadside Drug Testing Locations. *SSRN*.

Murphy, K., & Barkworth, J. (2014). Victim willingness to report crime to police: Does procedural justice or outcome matter most? *Victims & Offenders., 9*(2), 178–204. https://doi.org/10.1080/15564886.2013.872744

Murphy, K., Mazerolle, L., & Bennett, S. (2014). Promoting trust in police: Findings from a randomised experimental field trial of procedural justice policing. *Policing and Society., 24*(4), 405–424. https://doi.org/10.1080/10439463.2013.862246

National Drug Driving Working Group. (2018). *Australia's Second Generational Approach to Roadside Drug Testing*.

Piquero, A. R., & Pogarsky, G. (2002). Beyond Stafford and Warr's reconceptualization of deterrence: Personal and vicarious experiences, impulsivity, and offending behavior. *Journal of research in crime and delinquency, 39*(2), 153–186.

Pogarsky, G., & Piquero, A. R. (2003). Can punishment encourage offending? Investigating the "resetting" effect. *Journal of research in crime and delinquency, 40*(1), 95–120.

Reisig, M. D., Tankebe, J., & Meško, G. (2012). Procedural Justice, Police Legitimacy, and Public Cooperation with the Police Among Young Slovene Adults. *Varstvoslovje. Journal of Criminal Justice & Security., 14*(2).

Roberts, L., & Indermaur, D. (2009). *What Australians think about crime and justice: Results from the 2007 Survey of Social Attitudes*. https://www.aic.gov.au/sites/default/files/2020-05/rpp101.pdf.

Ryan, C., & Bergin, M. (2022). Procedural justice and legitimacy in prisons: A review of extant empirical literature. *Criminal justice and behavior, 49*(2), 143–163.

Sahin, N., Braga, A. A., Apel, R., & Brunson, R. K. (2017). The impact of procedurally-just policing on citizen perceptions of police during traffic stops: The Adana randomized controlled trial. *Journal of quantitative criminology, 33*, 701–726.

Salmon, P. M., Read, G. J., Thompson, J., McLean, S., & McClure, R. (2020). Computational modelling and systems ergonomics: A system dynamics model of drink driving-related trauma prevention. *Ergonomics, 63*(8), 965–980.

Sunshine, J., & Tyler, T. R. (2003). The role of procedural justice and legitimacy in shaping public support for policing. *Law & Society Review., 37*(3), 513–548. https://doi.org/10.1111/1540-5893.3703002

Tankebe, J., Boakye, K. E., & Amagnya, M. A. (2020). Traffic violations and cooperative intentions among drivers: The role of corruption and fairness. *Policing and Society., 30*(9), 1081–1096. https://doi.org/10.1080/10439463.2019.1636795

Trinkner, R., Mays, R. D., Cohn, E. S., Van Gundy, K. T., & Rebellon, C. J. (2019). Turning the corner on procedural justice theory: Exploring reverse causality with an experimental vignette in a longitudinal survey. *Journal of experimental criminology, 15*, 661–671.

Truelove, V., Davey, B., & Watson-Brown, N. (2022). Examining the differences in perceived legal and non-legal factors between drink driving and drug driving. *Journal of Criminology, 26338076221114481*. https://doi.org/10.1177/26338076221114481

Truelove, V., Freeman, J., Szogi, E., Kaye, S., Davey, J., & Armstrong, K. (2017). Beyond the threat of legal sanctions: What deters speeding behaviors? *Transportation research part F: Traffic psychology and behavior, 50*, 128–136.

Tudor-Owen, J. (2021). The importance of 'Blue Shirts' in traffic policing. *Policing: a journal of policy and practice, 15*(1), 480–491.

Wales, H. W., Hiday, V. A., & Ray, B. (2010). Procedural justice and the mental health court judge's role in reducing recidivism. *International Journal of Law and Psychiatry, 33*(4), 265–271.

Walters, G. D., & Bolger, P. C. (2019). Procedural justice perceptions, legitimacy beliefs, and compliance with the law: A meta-analysis. *Journal of experimental criminology, 15*, 341–372.

Watling, C., & Freeman, J. (2011). Exploring the theoretical underpinnings of driving whilst influenced by illicit substances. *Transportation Research Part F: Traffic Psychology Behavior., 14*(6), 567–578. https://doi.org/10.1016/j.trf.2011.06.002

Watling, C., Palk, G., Freeman, J., & Davey, J. (2010). Applying Stafford and Warr's reconceptualization of deterrence theory to drug driving: Can it predict those likely to offend? *Accident Analysis & Prevention, 42*(2), 452–458. https://doi.org/10.1016/j.aap.2009.09.007

Watson, B. (2004). *The psychosocial characteristics and on-road behavior of unlicensed drivers* Queensland University of Technology]. https://eprints.qut.edu.au/15923/.

Wells, H. (2008). The techno-fix versus the fair cop: Procedural (in) justice and automated speed limit enforcement. *The British Journal of Criminology, 48*(6), 798–817.

Wilson, L. A. (2011). Perceptions of legitimacy and strategies of resistance: Melbourne illicit drug users and random roadside drug testing. *Current Issues in Criminal Justice, 23*(2), 183–201. https://doi.org/10.1080/10345329.2011.12035918

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