



Vehicle impoundment regulations as a means for reducing traffic-violations and road accidents in Israel[☆]

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ABSTRACT

The vehicle impoundment sanction in Israel is applicable to several violations, and authorizes police officers to impound a vehicle for period of 30 days, in addition to license suspension. This study examined the effects of vehicle impoundment on traffic-violations and road accidents in Israel, using both subjective and objective measures. A telephone survey was administered to 378 impounded drivers, examining their knowledge and support of the impoundment penalty, as well as the impoundment's effect on their daily life and subsequent driving behaviors. Survey results indicated most impounded drivers did not recognize the violations to which impoundment applies. Respondents described the impoundment experience as one, which interfered with a variety of daily life aspects, and eventually lead them to the adoption of safer driving behaviors. Additionally, data analysis of police records was performed on 1549 impounded drivers and 1354 controls with matching violations performed prior to the application of the impoundment regulation, comparing accident and traffic-violations involvement in the subsequent year. Results indicated that impoundment failed to yield a significant effect over subsequent accident involvement, compared to previous sanctions. A comparison of subsequent traffic-violations indicated lower rates of violations following impoundment as compared with previous sanctions. Specifically, drivers whose vehicle was impounded were less likely to commit traffic violations in the following year than drivers subjected to other sanctions. The results are explained according to psychological behavioral theories of punishment effectiveness. These findings provide further support for impoundment as a deterrent for several traffic-violations.

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1. Introduction

Road crashes are a major cause of death and serious injuries in many countries and extract a high cost on society (Tay, 2003). A prevalent approach in many countries involves high levels of enforcement supported by intensive publicity campaigns (e.g., Tay, 2005). Traffic laws sanctions tend to yield regional, short-term mild deterring effects (Hakkert et al., 2001; Sanderson and Cameron, 1983), and are more effective when applied in temporal proximity to the actual violation (Yu and Williford, 1995). Sanction severity appears to be of less consequence on short-term deterrence, sometimes yielding similar results for both strict and lenient sanctions (e.g. actual license revocation vs. suspended revocation (DeYoung, 1997a,b; Siskind, 1996; Watson, 1998; Watson and Siskind, 1997); fines vs. short time imprisonment (Martin et al., 1993)).

Research on sanctions focusing on licensure, such as revocation or suspension, found these sanctions as effective in the reduction of subsequent involvement in traffic violations and accidents (Kim et al., 2011; Ross and Gonzales, 1988), although they are relatively hard to enforce (Gebers et al., 1997). Stricter sanctions apply limitations not only on the offending driver but also on the vehicle, such as vehicle impoundment. Evidence to the effect of vehicle impoundment varies, indicating mainly a decrease in repeat convictions, especially for first-time offenders (Beirness et al., 1997; Crosby, 1995; DeYoung, 1998; DeYoung, 1999; Laurence et al., 1996; Rodgers, 1997). Although vehicle impoundment was followed by lower rates of accident involvement, these became evident only after a period of 2 to 3 years, and were apparently affected by other police activities employed during that period (Cooper et al., 2000; DeYoung, 1998; DeYoung, 1999; Sweedler and Stewart, 1997). These effects were limited to the offenders only, and were not carried out to the general population (DeYoung, 2000). Further variability is due to locale differences in the violations to which the sanction applies, the impounding agency, and the duration of the impoundment (DeYoung, 1998). In summary, vehicle impoundment and confiscation can be effective in the prevention of various repeat offenses, even after the vehicle is returned to its

[☆] The study was conducted for the Ministry of Interior Security in cooperation with the Israeli Police Traffic Department.

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owner. Impoundment is most effective when it is applied immediately after the actual violation, yet it is mostly a specific rather than a general deterrent, and yielding a significant effect usually requires several years.

Impoundment, as an additional measure to license suspension, was applied in Israel since June 2006. The Israeli impoundment regulation authorizes police officers to impound vehicles on-site for a 30 days period, in addition to license revocation pending trial, for the following violations: Driving without a valid license, driving with a suspended or revoked license, driving under the influence of intoxicating beverages or drugs, passenger over-quota, cargo overload, driving over hours limit, unaccompanied new driver or allowing a new driver to drive unaccompanied, and involvement in a hit and run accident. The initial effects of this regulation are the focus of this study.

The current study aimed at examining the effects of the impoundment regulation in Israel, subjectively, by surveying the perceived effects of impoundment on driving and daily behaviors, and the level of familiarity and agreement with the sanctions and the violations to which it applies; and objectively, by analyzing the police data on the consequent effects of vehicle impoundment on traffic-violations and accidents.

2. Methods

The methods and results section deal first with the impoundment's subjective effects as measured in a telephone survey, followed by the objective effects analyzed from police records data.

2.1. Participants

2.1.1. Telephone survey

The telephone survey aimed at exploring subjective impoundment effects. Participants consisted of 378 drivers randomly sampled from the 14,873 entries in the police impoundment records for the period of June 1, 2006 to December 31, 2007 (CI $95 \pm 5\%$). Table 1 presents the distribution characteristics of survey participants.

2.1.2. Police records data analysis

Police records data analysis focused on the objective effect of impoundment on subsequent involvement in traffic accidents and violations. Data analysis was performed for records of 1549 drivers whose vehicles was impounded ($M_{Age} = 28.62$, $SD_{Age} = 10.30$), and 1354 drivers who performed matching violation prior to the application of the impoundment sanction ($M_{Age} = 30.86$, $SD_{Age} = 10.29$; $t_{Age}(2901) = 5.86$, $p < .001$). The impoundment group data was sampled from police impoundment records for the period of June 1, 2006 to May 31, 2007, using random stratified sampling from each violation included in the regulation. The sample size was set to 1500 cases (CI $99.5 \pm 3\%$) with a correction applied to violations samples consisting of less than 100 cases (driving while revoked, passenger over quota, and driving over hours limit violations) for which the sample size was randomly set at 100 cases.¹ The control group data was sampled from traffic-violations convictions records for the period of June 1, 2004 to May 31, 2005, using a random stratified sample, proportionally matching the impoundment sample violation distribution. Female drivers were dropped as they comprised less than 5% of either group (impoundment: 75 women (4.6%); Controls: 68 women (4.8%); $\chi^2(1, N = 3046) = .50^{ns}$, i.e. outside the CI.

¹ Compared to their proportional representation in the original sampling framework, these violations were over-represented in the final sample to allow a wider coverage of the effect in various violations.

Table 1
Distribution characteristics of the survey participants (N = 378).

Gender	Males	334	(88.4%)
	Females	44	(11.6%)
Age groups	18–24	130	(34.5%)
	25–34	119	(31.6%)
	35–44	65	(17.2%)
	45–54	35	(9.3%)
	55–64	19	(5.0%)
	65+	9	(2.4%)
Marital status	Single	213	(56.3%)
	Married	139	(36.8%)
	Divorced	24	(6.3%)
	Widower	2	(0.5%)
Education	High school	270	(72.2%)
	Associate degree	41	(11.0%)
	Academic degree	63	(16.8%)
Monthly income (NIS)	0–5000	98	(30.0%)
	5001–7000	86	(26.3%)
	7001–10,000	100	(30.6%)
	10,001–12,000	24	(7.3%)
	12,001+	19	(5.8%)
	License tenure	Up to 2 years	34
Up to 5 years		107	(28.3%)
Up to 10 years		94	(24.9%)
Up to 20 years		77	(20.4%)
Over 20 years		66	(17.5%)
Daily driving hours		Up to 1 hr	111
	Up to 2 hrs	95	(26.1%)
	Up to 3 hrs	52	(14.3%)
	Up to 4 hrs	22	(6.0%)
	Up to 5 hrs	13	(3.6%)
	Over 5 hrs	71	(19.5%)
Vehicle class	Motorcycle	11	(2.9%)
	Passenger car	296	(78.3%)
	Commercial	54	(14.3%)
	Public/heavy vehicle	17	(4.5%)
Vehicle ownership	Self-owned	223	(59.0%)
	Owned by a family member	88	(23.3%)
	Company-owned/rental	67	(17.7%)
Previous revocation	Yes	274	(72.5%)
	No	104	(27.5%)

The final violation distribution in both data analysis samples, percentage of the total sample, and of the impoundment framework is presented in Table 2.

2.2. Materials

2.2.1. Telephone survey

A survey questionnaire was constructed, requiring respondents to identify the set penalties (knowledge), opine as to appropriate penalty (opinion), and report self-behavior on several traffic-violations, including 8 impoundment violations and 4 “distracter” violations. Knowledge and opinion were scored on a 5-point Likert-scale ranging from fines through license revocation to vehicle impoundment. Additionally, the questionnaire addressed the justification and effect of the impoundment on daily life and consequent driving behaviors, allowing for several effects to be specified simultaneously.

2.3. Procedure

2.3.1. Telephone survey

The telephone survey was conducted during September and October, 2008, by trained police officers to ensure the respondents legal privileges.

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