STATE OF CALIFORNIA
DEPARTMENT OF MOTOR VEHICLES

Comparison of Accident and Conviction Rates for Commercial Drivers Tested Under the Employer Testing Program and Commercial Drivers Tested by DMV

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INTRODUCTION

The Employer Testing Program (ETP) allows eligible employers to conduct drive tests and issue the Certificate of Driving Skills (DL 170) to commercial vehicle operators they employ. To participate in the program, an employer must demonstrate that their driving test and examiners meet standards set by DMV. Employers in the program are subject to annual inspections and audits by the department's Intrastate Audits Unit. If any deficiencies on the part of the employer are found, the department may impose restrictions ranging from warning letters to revocation or cancellation of the employer's testing authorization. Approximately 980 employers participate in this program, 60% of which are in the government sector (e.g., fire departments and Caltrans). To help in monitoring the program, the department's Research and Development Branch compared the driving records of licensed commercial drivers tested under the ETP to commercial drivers tested by DMV. The remainder of this paper presents the methods and results of the driver record analyses and a discussion of the findings.

METHODS

Drivers who were issued an original Class A or B Commercial license between July 1, 1999 and June 30, 2001 were included in the study. Drivers tested by DMV were compared to those tested by an ETP employer on their rates of total accidents, fatal and injury (fatal/injury) accidents, and convictions for traffic law violations accumulated during the 1-year period after licensure. The conviction counts included failures to appear in court and/or pay a fine (FTAs and FTPs) and traffic violator school (TVS) dismissals. Comparisons between the two groups were also made using 2-year post-license driving records for drivers who were licensed early enough to have a full 2-year post-license driving history.

The driving records were extracted from the department's automated Driver License (DL) master file. The ETP-tested drivers were identified by the presence of an

Attachment Code 17 on their driver record. All drivers with a firefighter restriction or ambulance driver certification on their commercial license were removed from the analyses, because these drivers are required to drive in emergency situations that put them at greater risk of having an accident and are also unlikely to have received a traffic citation while driving the emergency vehicle.

Analysis of Covariance (ANCOVA) was used to analyze the data. This technique statistically adjusts the criterion measure for differences between subjects on one or more variables called covariates. The covariates used in the present analyses were age, quadratic age (age^2), sex, total accidents and total convictions during the 2-years prior to issuance of the commercial license, and whether or not the driver held a Class A license. The count of prior convictions included FTAs, FTPs, and TVS dismissals. The statistical adjustments were made to help remove the effects of these covariates on the criterion measures before assessing differences between the criterion group means.

RESULTS

A total of 89,241 drivers were identified in the DL file pass. All drivers determined to have either a firefighter restriction (1,969), ambulance driver certification (121), or both (81) at the time of the file pass were removed from the analyses. All identified drivers had been licensed for at least a year and consequently had at least a 1-year post-license driving record. Table 1 presents the number of subjects, average age, percentage of women, average number of total accidents, average number of total convictions, and percentage of Class A drivers for each group. The two groups were not significantly different on average age and total prior accidents. However, the ETP-tested group had a significantly higher percentage of women ($p < .001$), a lower rate of total convictions ($p < .001$), and a lower percentage of Class A drivers ($p < .001$) than did the DMV-tested group. (The value of p represents the likelihood that the difference between group means is due to chance or sampling error. In the present analyses p must be less than .05 for the difference to be considered statistically significant.)

Table 1

Number of Subjects (*n*), Mean Age, Percentage of Women, 1-Year Prior Accident and Conviction Rates, and Percentage of Class A Drivers by Driver Group

Group	*n*	Mean age	% Female	Prior accidents (per 100 drivers)	Prior convictions (per 100 drivers)	% Class A
ETP-tested	17,566	38.06	21.07**	12.87	45.32**	35.33**
DMV-tested	69,504	37.99	12.22	13.51	56.45	64.02

**$p < .001$, two-tailed.

Table 2 shows unadjusted and covariate-adjusted group means for total accidents, fatal/injury accidents, and convictions during the 1-year period after licensure.

The adjusted total 1-year subsequent accident rate for the ETP-tested group (15.95) was 11.23% higher than the rate for the DMV-tested group (14.34), $p < .001$.

The same directional result was found for 1-year subsequent fatal/injury accidents; the adjusted rate for the ETP-tested group (3.84) was 10.34% higher than the rate for the DMV-tested group (3.48), $p < .05$.

A result in the opposite direction was found for 1-year subsequent convictions; the adjusted rate for the ETP-tested group (41.71) was 9.19% lower than the rate for the DMV-tested group (45.93), $p < .001$.

Table 2

Unadjusted (Observed) and Covariate-Adjusted Total Accident, Fatal/Injury Accident, and Total Conviction Rates for Each Group for the First Year After Licensure

Mean type Group	Total accidents (per 100 drivers)	Fatal/injury accidents (per 100 drivers)	Total convictions (per 100 drivers)
Unadjusted			
ETP-tested	15.76**	3.83*	32.87**
DMV-tested	14.38	3.48	48.16
Adjusted			
ETP-tested	15.95**	3.84*	41.71**
DMV-tested	14.34	3.48	45.93

*$p < .05$, two-tailed. **$p < .001$, two-tailed.

Table 3

Number of Subjects (*n*), Mean Age, Percentage of Women, 1-Year Prior Accident and Conviction Rates, and Percentage of Class A Drivers by Driver Group

Group	*n*	Mean age	% Female	Prior accidents (per 100 drivers)	Prior convictions (per 100 drivers)	% Class A
ETP-tested	9,669	38.22	21.18**	12.20*	46.06**	34.69**
DMV-tested	38,303	38.27	12.19	13.40	57.19	64.25

*$p < .05$, two-tailed. **$p < .001$, two-tailed.

Of subjects in the above comparisons, a total of 47,972 had a full 2-year post-license driving record. Table 3 presents the covariate measures for these drivers. The two groups were not significantly different on average age, but the ETP-tested group had a significantly higher percentage of women ($p < .001$), lower rates of 1-year prior accidents ($p < .05$) and convictions ($p < .001$), and a lower percentage of Class A drivers ($p < .001$) than did the DMV-tested group.

Table 4 shows the unadjusted and covariate-adjusted criterion means during the 2-year period after licensure for ETP- and DMV-tested drivers.

The results of the analyses of 2-year subsequent driving records are consistent with those of the analyses of 1-year subsequent driving records. The adjusted 2-year subsequent total accident rate for the ETP-tested group (29.53) was 8.97% higher than the rate for the DMV-tested group (27.10), $p < .001$.

Table 4

Unadjusted (Observed) and Covariate-Adjusted Total Accident, Fatal/Injury Accident, and Total Conviction Rates for Each Group 2 Years After Licensure

Mean type Group	Total accidents (per 100 drivers)	Fatal/injury accidents (per 100 drivers)	Total convictions (per 100 drivers)
Unadjusted			
ETP-tested	28.87*	7.80**	62.15**
DMV-tested	27.27	6.54	93.71
Adjusted			
ETP-tested	29.53**	7.94**	79.75**
DMV-tested	27.10	6.50	89.27

*$p < .05$, two-tailed. **$p < .001$, two-tailed.

Similarly, the adjusted fatal/injury accident rate for the ETP-tested group (7.94) was 22.15% higher than the rate for the DMV-tested group (6.50), $p < .001$.

A reverse result was again found for convictions; the 2-year subsequent adjusted conviction rate for the ETP-tested group (79.75) was 10.66% lower than the rate for the DMV-tested group (89.27), $p < .001$.

DISCUSSION

In both the 1-year and 2-year post-license driver record comparisons, the ETP-tested drivers had significantly higher rates of total accidents and fatal/injury accidents, and a significantly lower rate of convictions. However, due to the lack of random assignment of subjects to the two testing programs (ETP vs. DMV), none of these differences can be attributed with any certainty to the type of testing given to the applicants. On the contrary, it is highly likely that any differences between the groups are related, at least in part, to the preexisting differences between drivers who voluntarily chose to take the commercial test through the ETP and those who elected to be tested by DMV. Adjusting the criterion means through the use of ANCOVA probably removed some of the self-selection bias effects, however it is very unlikely that this statistical procedure would have accounted for all of the differences other than the method of testing that would influence whether a driver was involved in an accident or convicted of a traffic violation. For example, it is hypothetically possible that the ETP-tested drivers drove more miles than the DMV-tested drivers, which would have put them at greater risk of being involved in an accident. In addition, if ETP employers imposed sanctions for traffic violations, this would have tended to discourage ETP-tested drivers from breaking the law and could be an explanation for their lower conviction rates. In any event, the quasi-experimental nature of the analyses prevents any conclusion that the differences between the groups on the criterion measures were caused by the difference in the method of testing rather than to other factors.