Data from Comprehensive Driving Evaluations: Predictors of Failing a Road Test

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Background

- Older drivers – fastest growing segment
  - Expected to double in the next decade
- Older drivers have higher collision rates/mileage
  - More serious injuries and fatalities (Staplin et al., 2003)
  - Begins around age 70 (Bedard et al., 2001; Dickerson et al., 2007)
- Determining the most effective means to identify, screen and assess medically at-risk drivers has become a major concern

Prior Studies

- Many studies that have examined driving performance
  - Have recruited specific medically at-risk groups (e.g. Parkinson's disease, MCI)
- Some have control group (healthy older drivers)

Objective

- The purpose was to collect data from drivers referred for a comprehensive driving evaluation to determine predictors of failing the road test.

Who is referred?

Taking a Road Test:

-At-fault accident after age of 70

-Physician Referral

-Police Referral

-MTO screening (as of January 28th 2014)

- a vision test
- a driver record review
- an improved, in-class group education session
- two short, in-class screening exercises

Recruitment

- Data was collected from one driving assessment center in South-Western Ontario
- Data was collected retrospectively from 2012-2015 and prospectively from 2015 to January, 2017
- Sample: 200 client records

Variables Collected

- Demographics (age, gender)
- Montreal Cognitive Assessment [MoCA]
- Screen for the Identification of Cognitively Impaired Medically At-Risk Drivers [SIMARD]
- Trails A & B
- Useful Field of View [UFOV]
- On-road pass/fail outcomes

Findings

Sample Characteristics (N=200)	Mean (SD) or n (%)
Gender • Male • Female	 146 (73.4%) 53 (26.6%)
Mean Age	69.6±14.4
Reasons for Referral • Medical/Physician • Other	 164 (82.0%) 36 (18.0%)
Referred by MTO Yes No	 61 (30.5%) 239 (69.5%)

Findings

Primary Diagnosis (N=200)	N (%)
• Dementia	29 (14.5%)
• MCI	58 (29.0%)
• CVA	41 (20.5%)
• MS	7 (3.5%)
• PD	9 (4.5%)
• TBI	5 (2.5%)

Findings

Clinical Test Scores	Mean (SD) or N (%)
MoCA (n=190)	22.0±4.6
Trails A (n=188) Trails B (n=190)	69±75 seconds 244±170 seconds
UFOV (n=151) • Very low or low • Low/moderate • Moderate to high	 83 (55.0%) 27 (17.9%) 41 (27.1%)
Simard (n=155) • 30 or less • 31 t0 70 • >70	 33 (21.3%) 94 (60.6%) 28 (18.1%)

Findings

- Pass/Fail (n=194)
  - Pass (n=54; 28%)
  - Fail (n=60; 31.1%)
  - Fail but lessons and re-test recommended (n=80; 41.1%)

- Pass/Fail (n=194)
  - Pass (n=54; 27.8%)
  - Fail (n=140; 72.2%)

Findings

	Pass (n=54)	Fail (n=140)	Significance
Age	61.0±14.8	72.9±12.9	t=-5.21, p<.001
Gender	♂ 28.9% ♀ 71.1%	♂ 25% ♀ 75%	NS
MoCA	24.3±4.0	21.1±4.5	t=4.79, p<.001
Trails A	47±17 sec	70±33 sec	t=-6.04, p<.001
Trails B	144±117 sec	278±160 sec	t=-6.32, p<.001

Findings

	Pass (n=44)	Fail (n=106)	Significance
UFOV			
1	31 (70.5%)	18 (17%)	$\chi^2 = 43.53$,
2	8 (18.2%)	25 (23.6%)	$p < .001$
3	2 (4.5%)	25 (23.6%)	
4	2 (4.5%)	21 (19.8%)	
5	1 (2.3%)	17 (16.0%)	
SIMARD			
1	2 (4.7%)	30 (27.0%)	$\chi^2 = 30.61$,
2	22 (51.2%)	72 (64.9%)	$p < .001$
3	19 (44.2%)	9 (8.1%)	

Regression Model
(N = 126; -2 Log Likelihood = 80.63; Nagelkerke R = .627)

Odds Ratio Estimate						
EFFECTS	**DF**	**B**	**SE**	**Significance ($p < .05$)**	**e^B**	**95% CI**
Age	1	0.02	.03	.54	1.02	.962-1.077
MoCA	1	-.118	.11	.30	.889	.711-1.111
Trails A	1	.02	.02	.24	1.02	.984-1.064
Trails B	1	-.009	.01	.06	1.01	.999-1.02
UFOV **5** **4** **3** **2**	4	9.57 1.409 2.944 1.616 17.76	 4.76 6.31 1.70 .000	 **.029** **.012** .193 .999	 4.09 18.99 5.03 e	 1.151-14.51 1.911-188.63 .442-57.36 .0000-e
Simard **30-70** **Less than 30**	2	.483 .000 .330	 .829 1.603	 .99 .57	. 990 2.051	 .195-5.027 .108-.58.118

Conclusions

- The findings suggest that on a high level, the UFOV Risk indices of 4 and 5 are predictive of failing a road test.
- But it’s not perfect!

- Limitations
  - Sample size

Next Steps

- Merging of other CDE sites (larger database)
- Re-do the analysis (and examine specific medical conditions)
- Examine both predictors of driving errors and failing a road test
- Examining change scores in those who undergo a second road test (after training)
- ROC assessments to determine cut-points of tests

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