

Acceptability of 1-Screen and 3-Screen Simulators for Assessing Driving Capacity

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background

Driving allows many older people to maintain their independence and mobility. However, aging has been associated with declines in cognitive capacity and physical abilities that may impair one's ability to drive safely. Nevertheless, older adults should not have their driving licenses revoked simply on the basis of age or an age-related medical diagnosis, because many are still safe to drive.


Driving simulators provide a way to assess driving capacity in a highly standardized and safe fashion. They may be more affordable and time efficient than on-road driving assessments, while demonstrating a good level of correspondence with on-road measures of driving behaviour. This being said, it is not clear how older adults view driving simulators as tools to assess driving capacity.

objective

Our goal was to examine the acceptability of driving simulators as a tool to assess driving capacity from the perspective of middle-aged and older drivers.

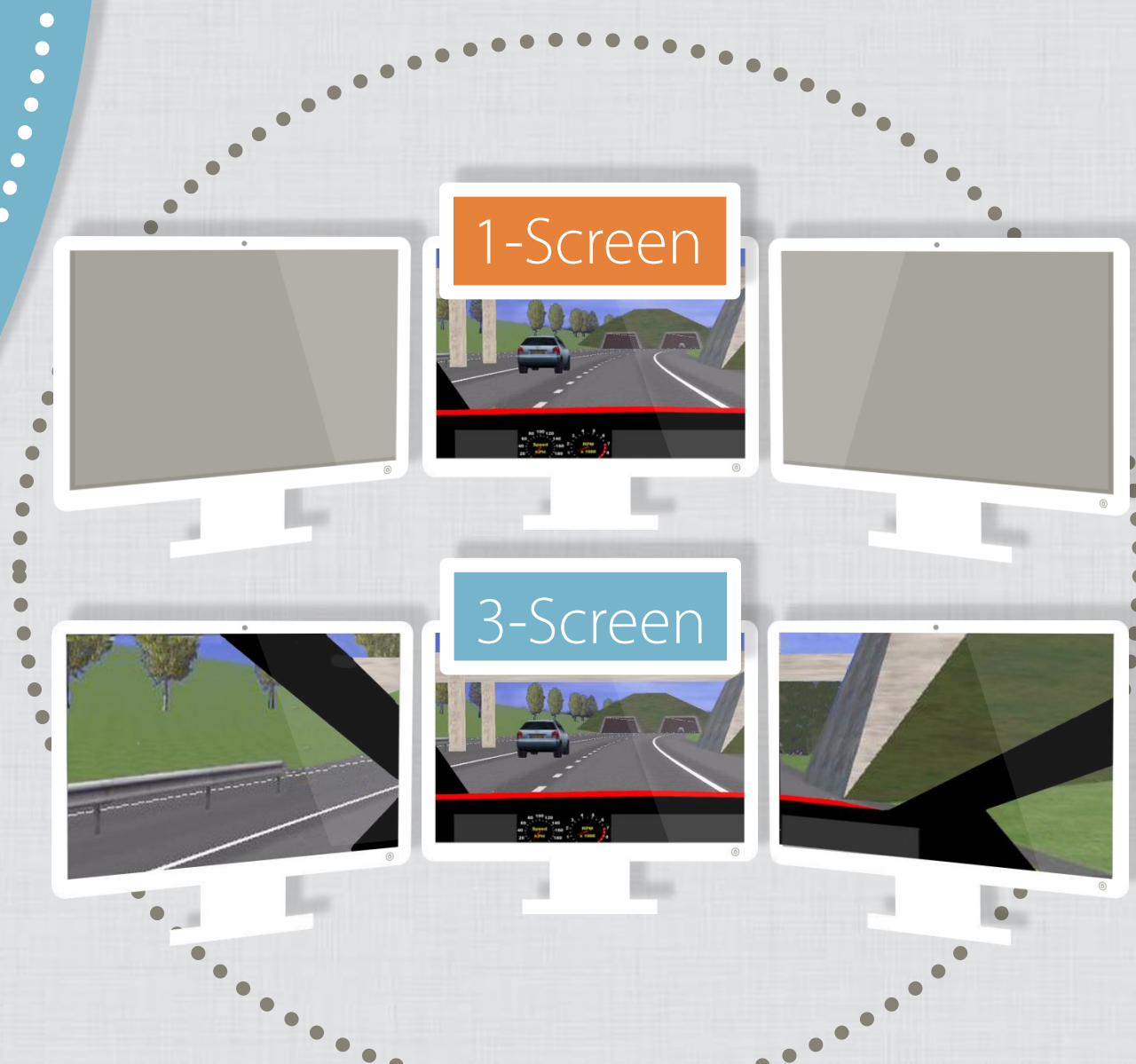
what we did

A total of 32 drivers were recruited, half in each of two age groups (see below).

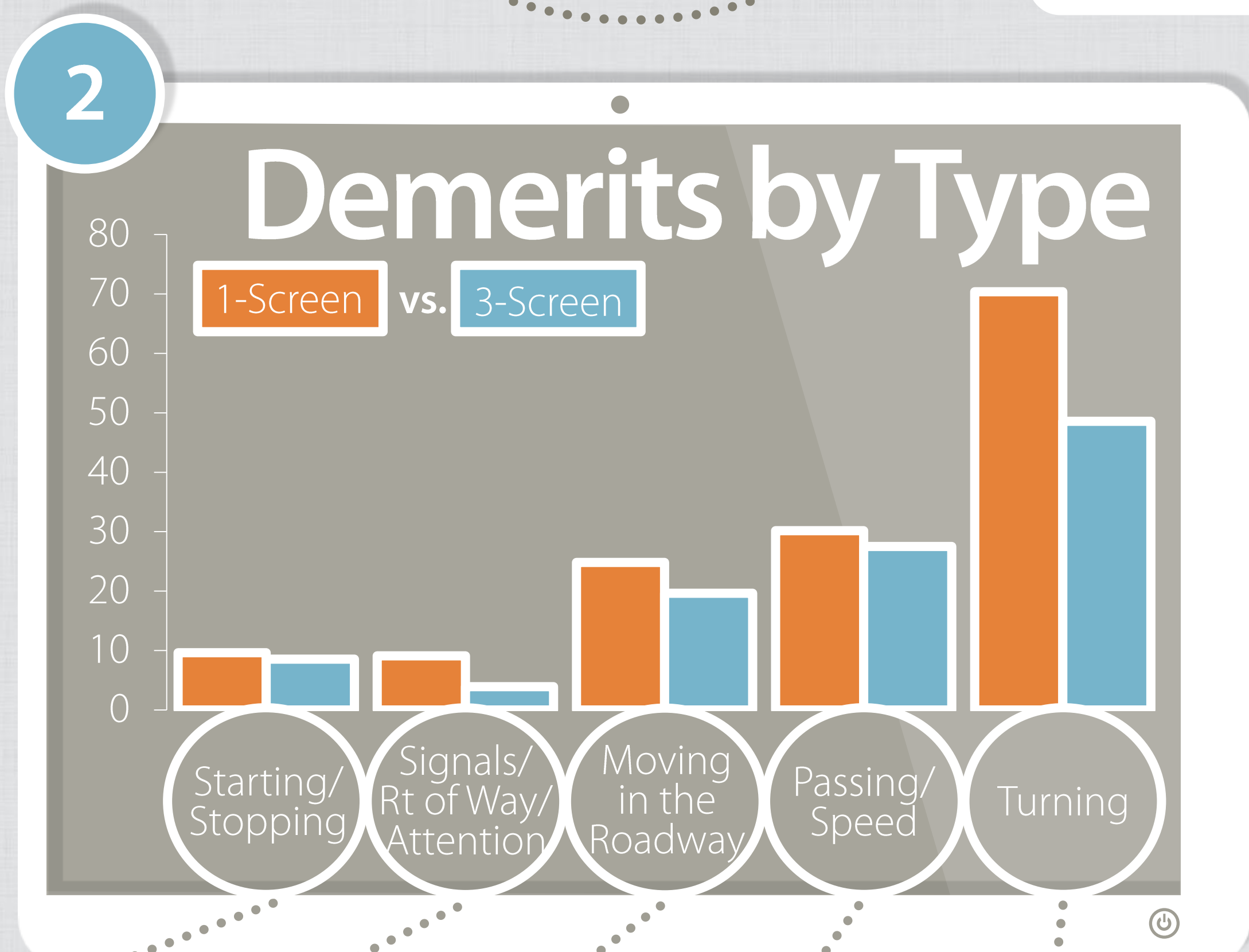
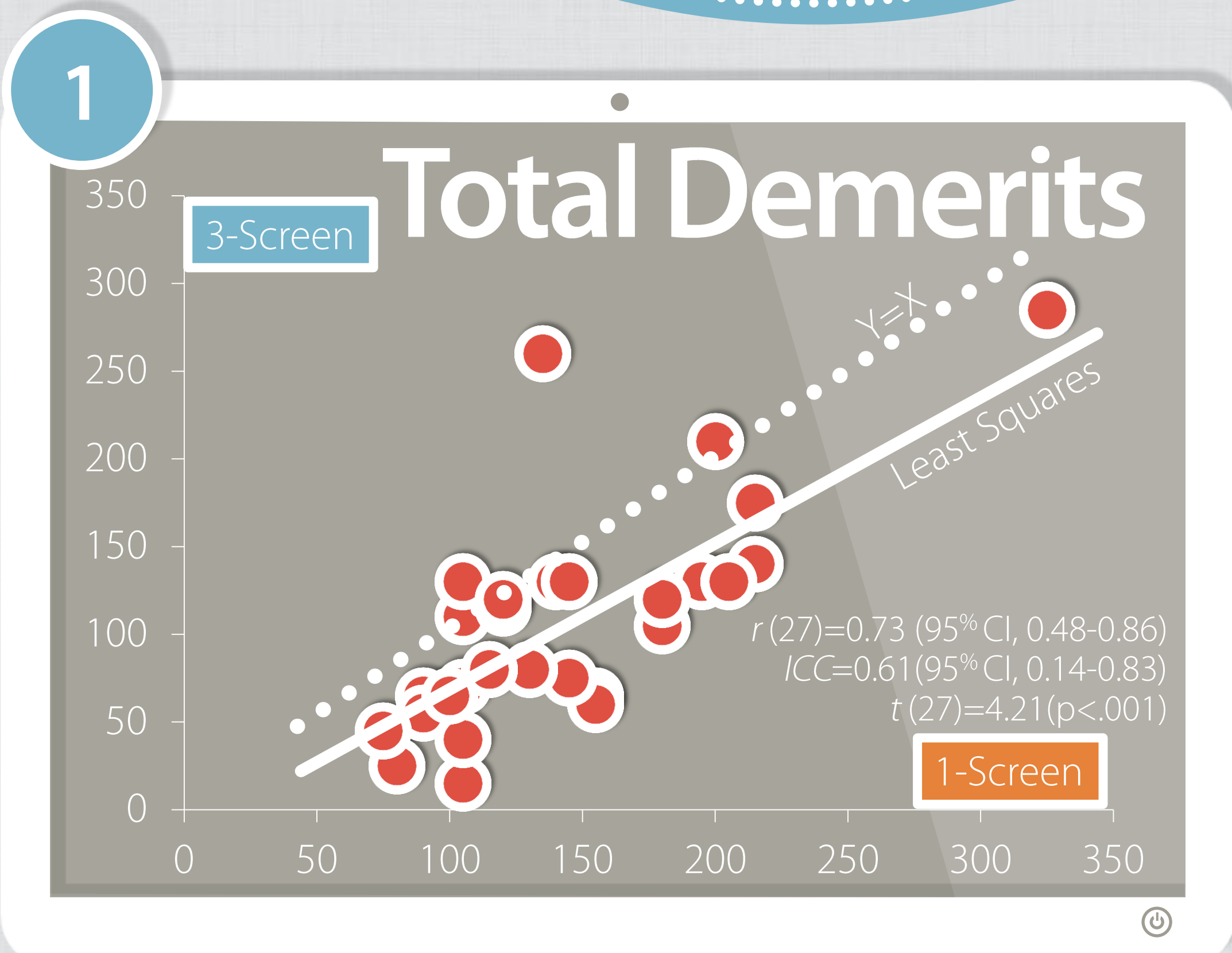
Middle-Age
 40-55 years

 mean age
47.5
 (SD=7.0)

Older
 65 years +

 mean age
75.5
 (SD=5.2)



Following a practice drive on the simulator, participants completed a simulated Ontario G2 course using two set-ups. The 1-screen set-up was administered first to help participants habituate to simulated driving and minimize simulator discomfort. This was followed by the 3-screen set-up. Performance on the drives was scored using the Manitoba Road Test demerit point system. A semi-structured interview was performed to gain further insight into participants': 1) perceptions of simulators for driver assessment and training, and 2) experiences on the two set-ups.



Pearson <i>r</i> (95% CI)	0.63 (0.33-0.81)	0.27 (-0.12-0.58)	0.64 (0.36-0.82)	0.71 (0.47-0.86)	0.61 (0.31-0.80)
ICC (95% CI)	0.60 (0.30-0.80)	0.22 (-0.10-0.52)	0.62 (0.34-0.81)	0.71 (0.46-0.85)	0.44 (-0.05-0.74)
t-test (<i>p</i> value)	0.59 (0.56)	2.83 (.01)	1.87 (0.07)	1.03 (0.31)	5.28 (<.001)

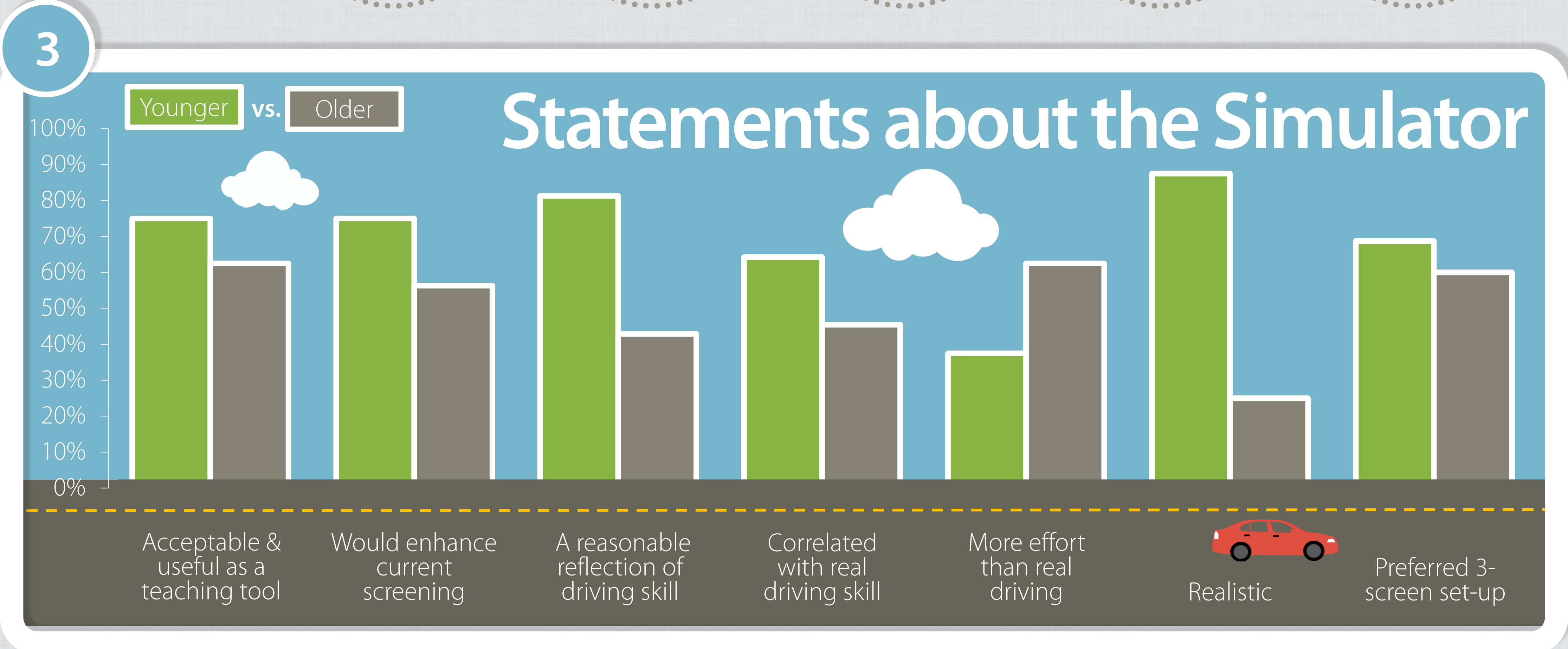
what we found

Overall, the Pearson *r* indicated a good positive relationship between total demerit points on the two drives. This being said, there were significantly more errors on the 1-screen drive (see Figure 1).

When we looked at the different types of demerit points (Figure 2), we found that 3/5 showed substantial agreement between drives with strong positive relationships, and no statistically significant difference between demerit points recorded on each.

Of the remaining two types of demerit points, the first (signal violation/ right of way/ inattention) showed significantly more errors on the 1-screen set-up and a weak relationship with the *ICC* indicating only fair agreement. The second (turning) did show a strong positive relationship between drives, but with statistically significantly more errors on the 1-screen set-up and only fair agreement as indicated by the *ICC*.

The themes deduced from the interviews are depicted in Figure 3.



conclusion

Regardless of age, the majority of participants considered driving simulators an acceptable tool for assessing driving capacity and believed they would enhance current driving assessments. In addition, performance was similar on the 1- and 3-screen simulators for most driving behaviours.

Our results suggest that simulators may offer a safe, acceptable, portable, and inexpensive screening tool for drivers, and open the door for translation into future research and product development.

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