



Do low levels of confidence suppress the tendency to violate?

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ABSTRACT

It is well known that the tendency to violate is associated with accident involvement. What is paradoxical is that across the early development of driving, violations are increasing at the same time that accident liability is decreasing. It is hypothesised that at the early stage of driving low levels of confidence suppress the tendency to violate. As confidence is increased over time the tendency to violate is gradually released. Consistent with this hypothesis an analysis of several thousand new drivers found that as confidence increased so also did the tendency to violate. Implications for testing and training are considered.

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1. Introduction

In driving it has been known for some time that the tendency to violate is associated with accident involvement ([de Winter & Dodou, 2010](#); [Little, 1966](#)) such that higher levels of violations are associated with higher levels of accident involvement. What is more surprising is that the tendency to violate increases across the early months of driving at the same time that accident liability is decreasing ([Roman, Poulter, Barker, McKenna, & Rowe, 2015](#); [Waller, Elliott, Shope, Raghunathan, & Little, 2001](#)). Another surprising feature of the violation developmental trend is that the factors that might underlie violations, such as sensation seeking, have a quite different developmental trend. Sensation seeking peaks in the early teens and decreases thereafter ([Waylen & McKenna, 2008](#)), whereas the tendency to violate increases from the mid to late teens. One possible explanation for the violation developmental trend is that the expression of the tendency to violate is being suppressed in the early part of driving by low levels of confidence.

A more detailed exposition of the suppression hypothesis is as follows. First, we might reasonably expect (and will test) that confidence levels will be low at the start of the driving career and that, with experience, confidence levels increase. It has been demonstrated for some time that drivers have a relatively high opinion of their driving skill ([McKenna, Stanier, & Lewis, 1991](#); [Svenson, 1981](#)) but it might reasonably be anticipated that such a perception would develop over time. Second, people vary in their tendency to violate ([Reason, Manstead, Stradling, Baxter, & Campbell, 1990](#)). Findings from [Waylen and McKenna \(2008\)](#) indicated a wide variation in future tendency to driving violations with sex differences and correlations with sensation seeking already established even before novices learn to drive. Third, and critically, it is proposed that low levels of confidence will suppress the tendency to violate. In other words, at the early part of driving we might expect new drivers to express a range of confidence levels with most expressing low levels of confidence. The proposal is that those who report low levels of confidence will be less inclined to express any tendency to violate. As drivers move from low to higher levels of confidence we might expect the expression of the tendency to violate to be gradually released.

In order to examine the relationship between confidence and the tendency to violate the UK Department for Transport's Cohort II study was examined. This large-scale study tracked new drivers across the first three years of driving. Within the

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data set two measures of confidence were considered, one assessing the new driver's estimate of their personal skill and the other their overall confidence in their driving ability. The tendency to violate was assessed using the Driver Behaviour Questionnaire (Reason et al., 1990).

2. Method

2.1. Sample

The Cohort II study involved following new drivers through their driving test with questionnaire data collected at 6, 12, 24, and 36 months after successful completion of the driving test. A detailed description of the method is provided by Wells, Tong, Sexton, Grayson, and Jones (2008). Violation data were available for 9790 drivers at 6 months, 7224 at 12 months, 4103 at 24 months and 2703 at 36 months. At the start of the project the average age was 21.9 years with 6262 females and 3528 males driving an average of 6230 miles annually.

2.2. Measures

The Driver Behaviour Questionnaire version used in this study was based on Lajunen, Parker, and Summala (2004), differentiating slips, errors, lapses, and violations.

2.2.1. Perceived level of confidence

Responses to the question, "In general, how confident are you in your driving ability?" were measured on this scale: 1 = 'Very confident', 2 = 'Fairly confident', 3 = 'Not very confident', 4 = 'Not at all confident'. As category 4 was used very infrequently (e.g., <0.3% of all responses from the 6-month cohort), these responses were combined with category 3 for the analyses.

2.2.2. Perceived level of skill

Responses to the question, "How skilled a driver are you?" were measured on this scale: 1 = 'More skilful than others', 2 = 'As skilful as others', 3 = 'Less skilful than others'.

2.2.3. Violations

Self-reported violations were reported in response to these eight questions; 'When driving, how often do you do each of the following? (1) Overtake a slow driver on the inside. (2) Pull out of a junction so far that the driver with the right of way has to stop and let you out. (3) Cross a junction knowing that the traffic lights have already turned against you. (4) Disregard the speed limit on a residential road. (5) Stay in a motorway lane that you know will be closed before forcing your way in at the last minute. (6) Drive so close to the car in front that it would be difficult to stop in an emergency. (7) Race away from the traffic lights with the intention of beating the driver next to you. (8) Disregard the speed limit on a motorway.' All responses were measured on the scale: 1 = 'Never', 2 = 'Hardly ever', 3 = 'Occasionally', 4 = 'Quite often', 5 = 'Frequently', 6 = 'Nearly all the time'. The measure employed was the mean of the eight items. The distribution of self-reported violations was positively skewed with the majority of individuals endorsing low numbers on the scale.

3. Results

As predicted average ratings of both confidence and skill increased over time. Average ratings of confidence for the four time periods respectively were, 1.82, 1.80, 1.73, 1.71 indicating a trend of increasing confidence over time. A one-way repeated measures ANOVA was conducted to compare the confidence judgments across the four time periods. Mauchly's test indicated that the assumption of sphericity had been violated so the Greenhouse-Geisser correction to the degrees of freedom was applied indicating significant differences in ratings of confidence $F(2.87, 3846.76) = 28.71, p < .001, \eta^2 = .021$.

The average ratings of skill for the four time periods respectively were 2.04, 1.98, 1.91, 1.88 indicating a rating trend from "less skilful than others" to "more skilful than others". A one-way repeated measures ANOVA was conducted to compare skill judgments across the four time periods. Mauchly's test indicated that the assumption of sphericity had been violated so the Greenhouse-Geisser correction to the degrees of freedom was applied indicating that there were differences in ratings of skill over time $F(2.92, 3898.85) = 59.67, p < .001, \eta^2 = .043$. The correlation between ratings of confidence and skill over time varied from $r = .41$ to $r = .43$ indicating some shared variance.

The association between confidence and violations within each of the time periods is shown in Fig. 1 where it is clear that higher levels of confidence were associated with higher levels of violations. There was a significant effect of confidence on violations for all of the time periods; 0–6 months $F(2, 9776) = 41.77, p < .001, \eta^2 = .008$, 6–12 months $F(2, 7214) = 36.26, p < .001, \eta^2 = .01$, 12–24 months $F(2, 4095) = 27.58, p < .001, \eta^2 = .01$, and 24–36 months $F(2, 2696) = 19.20, p < .001, \eta^2 = .01$. For comparison purposes, analyses on participants who completed all violations questions and all confidence questions across all four time periods, were also significant.

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