Should autonomous cars have several driving styles?

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Source: https://duabroad.com/tag/india/

http://www.darkroastedblend.com/2011/06/more-crazy-intersections-traffic-jams.html


What is a driving style?

Habitual way of driving, which is characteristic for a driver or a group of drivers (Sagberg et al, 2015)

- Tends to occur in a consistent way, may include both automatized and consciously chosen
- A driver may have a repertoire of driving styles applied under different conditions (e.g., specific environment).
- Exclude behaviour patterns determined exclusively by the driving context.
Global driving style

Aggressive

Specific driving style

Overspeeding
Driving in left lane
Inappropriate horn honking
Flashing lights at driver ahead
Tailgating/Short headway keeping
Jerky driving

Indicator
Combination of indicators below
% time driving > speed limit
% time driving on the left lane
Honking rate exceeding predefined criterion
Flashing rate exceeding predefined criterion
% of driving with headway distance < X m to the vehicle in-front
% of driving with time headway < X sec
% time with longitudinal / lateral jerk > threshold criterion

Measure
Speed
Lane used
Horn activation
Highbeam fla activation
Headway distance
Time headwa
Longitudinal, jerk or acceli

Global driving style

Specific driving style

Calmness

Indicator
Responding to pressure from other drivers
Always ready to react to unexpected manoeuvres by other
Get a thrill out of breaking the law
Tend to overtake other vehicles whenever possible

Measure
Score above certain level (e.g. often or always)
Factor score above predefined criterion
Item score below certain level, e.g. <3
Factor score above predefined criterion
Item score above certain level
Factor score above predefined criterion
Item score above certain level

Careful

Indicator
Score above certain level
Factor score above predefined criterion
Item score below certain level, e.g. <3
Factor score above predefined criterion
Item score above certain level
Factor score above predefined criterion
Item score above certain level

Measure
Score on frequency scale (e.g., never to always)
Overall score on “calmness” factor
Score on 6-point frequency scale
Overall score on “careful” factor
Score on 6-point scale of fit to driver’s feelings/thoughts/behaviour (“not at all” to “very much”)}
Overall score on “aggressive” factor
Score on visual analog scale of agreement (“not at all” to “very much”)
Curves, work zones, etc

Figure 1. A tentative model of the establishment of driving style in terms of a process of habit formation.

Is there such a universal distribution?

Source: Bossdorf-Zimmer et. al. 2013, DOI: 10.1365/s38311-011-0033-4 p46
Source: http://indiaopines.com/what-is-your-driving-style/
Human's driving styles

Robot's driving styles

Figure from: AdaptIVe, D2.1
Thank you!

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