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Appendix A: Annotated questionnaire

Italics are used to denote routing instructions, to indicate the response options for banks of items with the same response alternatives, and to indicate which items were combined into the scales used in the analyses for the article.

Thank you for answering this questionnaire, which should take about ten minutes to complete. It for a project funded by Goodyear and carried out by academics at the London School of Economics on attitudes towards technological developments intended to assist drivers. The survey will be completed by respondents in eleven European countries. Please note that there are no right or wrong answers to the questions. The aim of the survey is to find out about people's opinions. Please be assured that your responses will be anonymous.

Q1. Do you have a current, valid driving license?
- Yes
- No

If No is selected, skip to end of survey

Please type the current month in the box below and keep all characters in lower-case.
Attention-check question: if answer does not contain 'june', skip to end of survey

The technological optimism scale is comprised of items in Q2. Those items used in the scale are highlighted in bold font, and (R) denotes where we reversed the scoring direction for the item, so that higher values in all cases indicate more favourable attitudes towards technology.

Q2. To what extent do you agree or disagree with the following statements?
Response options: Strongly agree, Agree, Neither agree nor disagree, Strongly disagree, Don't know
- **Science and technology make our way of life change too fast (R)**
- **I'm not interested in new technologies (R)**
- We have no option but to trust those governing science
- **Science and technology are making our lives healthier, easier and more comfortable**
- **I enjoy making use of the latest technological products and services when I have the opportunity**
- **New technologies are all about making profits rather than making people's lives better (R)**
- **I am worried about where all this technology is leading (R)**
- We have no option but to adapt to the new technologies that are coming
- **Machines are taking over some of the roles that humans should have (R)**
- The more that we can use technology to control the natural world, the better

The enjoyment of driving scale is comprised of semantic differential items in Q3 (the statements on the left were coded 1 and the statements on the right coded 5). Those items used in the scale are highlighted in bold font, and (R) denotes where we reversed the scoring direction for the item, so that higher values in all cases indicate greater enjoyment of driving.

Q3. Now we are going to move on to talking about driving. Please read the following pairs of statements. For each pair, please select a point on the scale to show how much closer your view is to one of them than to the other. If you agree with both equally strongly, please select the middle point.

In this country, most people on the roads drive badly		In this country, most people on the roads drive well
I only drive because I have to		**I enjoy driving**
My car says something about who I am		I don't mind what car I'm driving: it's just a car
I find driving easy (R)	*[5 points are given between the statements]*	**I find driving difficult (R)**
If I'm travelling by car I prefer to be a passenger rather than the driver		**If I'm travelling by car I prefer to be the driver rather than a passenger**
I am glad that there are comprehensive rules and regulations on the road		I find all the rules and regulations on the road a nuisance
I find new technology/gadgets in cars helpful for my driving		I find new technology/gadgets in cars unhelpful for my driving
I like to know the technicalities about how my car works		I'm not interested in knowing the technicalities of how my car works
I don't mind being a passenger in a car		I feel I need to be the one in control of the car

Q4. Approximately how far do you drive in a typical year?
- Less than 5,000 km (3,100 miles)
- Between 5,000 and 10,000 km (3,100 and 6,200 miles)
- Between 10,000 and 20,000 km (6,200 and 12,500 miles)
- Between 20,000 and 40,000 km (12,500 and 25,000 miles)
- More than 40,000 km (25,000 miles)
- I don't know

Q5. How many years ago did you obtain your driving license?
- Less than 3 years ago
- 3 - 7 years ago
- 8 - 15 years ago
- 16 - 25 years ago
- More than 25 years ago

Q6. Over the course of a typical year, how much of your driving time do you spend on the following types of roads?
Response options: None of my driving time, A little of my driving time, A fair amount of my driving time, A lot of my driving time, All of my driving time
- Motorways or similar multi-lane roads
- Roads in cities or large towns
- Roads in small towns or villages
- Small roads in the countryside

For one of the split ballot experiments in this study, half UK and German respondents were randomly allocated to the condition that Q7-Q9 were asked very near the end of the questionnaire, just before Q31.

The driving sociability scale is comprised of items in Q7 and Q8. Those items used in the scale are highlighted in bold font, and (R) denotes where we reversed the scoring direction for the item, so that higher values in all

cases indicate more sociable orientations towards driving. Note that scale scores for Serbia are calculated excluding the item 'Each driver has to prioritise their own progress over other people's', due to the low reliability of the items for Serbia in general and for that item in particular.

Q7. Please tell us to what extent you agree or disagree with the following statements about driving in general.
Response options: Strongly agree, Agree, Neither agree nor disagree, Strongly disagree, Don't know
- You need to be able to communicate with other road users when you are driving
- **The other motor vehicles all have the same right to be on the road**
- **As drivers we all need to help keep the traffic flowing**
- Being able to make eye contact with other drivers is an important element of driving
- **Each driver has to prioritise their own progress over other people's (R)**
- **As drivers we all need to co-operate with the other drivers on the road**

Q8. And now, please give us your opinion on the following statements, by telling us for each one how often it applies to you.
Response options: Always, Usually, Sometimes, Occasionally, Never, Don't know
- I think of other cars as just traffic rather than thinking about the drivers inside them
- **I find that other drivers try to bully me on the road (R)**
- **I don't mind being at the back of a queue of traffic, because we all get there in the end**
- **When I am in a queue of traffic that is merging with another I just force my way in (R)**
- **When another driver has made way for me I feel it's my turn to make way for someone else later on**
- **If another driver impedes me I will impede another driver later on (R)**
- **When queues of traffic are merging drivers should take turns**
- **It's ok for someone to push into a queue if they are in a hurry (R)**
- **If it slows me down I won't help other drivers (R)**

Q9. Now we are going to ask you about how drivers know the right way to behave towards other drivers on the road. To what extent do you agree or disagree with any of the following statements?
Response options: Strongly agree, Agree, Neither agree nor disagree, Strongly disagree, Don't know
- The formal, written driving regulations are detailed enough to tell drivers how to behave in all situations
- Experience on the road is the most important factor in learning how to behave towards other road users
- Formal driving instruction is the most important factor in learning how to behave towards other road users
- There are unwritten rules about how one should behave towards other drivers
- All drivers would agree on how to behave in the right way with other road users

Q10. Now we'd like to ask you next for your opinion on autonomous cars, sometimes also called driverless cars. Autonomous cars are cars which drive themselves with little or no intervention by the human user. Already, many cars have advanced driver assistance systems such as lane departure warning intended to increase safety. Now, making the car fully autonomous could be the next step. How would you feel about driving on roads alongside autonomous (driverless) cars?
- Totally comfortable
- Quite comfortable
- Not very comfortable
- Not at all comfortable
- Don't know

The Perceptions of AV (PAV) scale is comprised of items in Q11 and Q13. Those items used in the scale are highlighted in bold font, and (R) denotes where we reversed the scoring direction for the item, so that higher values in all cases indicate more positive attitudes towards AVs.

Q11. Thinking about your choice in the previous question, how much do you agree or disagree with the following statements?
Response options: Strongly agree, Agree, Neither agree nor disagree, Strongly disagree, Don't know
- **Most accidents are caused by human error so autonomous vehicles would be safer**
- **I wouldn't mind whether I was driving alongside human drivers or autonomous vehicles (R)**
- I don't know enough about how autonomous vehicles work
- **Autonomous cars could malfunction (R)**
- **As a point of principle, humans should be in control of their vehicles at all times (R)**
- **Autonomous cars would behave more predictably than human drivers**
- **Machines don't have the common sense needed to interact with human drivers (R)**
- **Machines don't have emotions so they might be better drivers than humans**
- I wouldn't mind as long as all cars were autonomous but mixing human drivers and autonomous vehicles will not work

Q12. And how would you feel about using an autonomous (driverless) car instead of driving a traditional car?
- Totally comfortable
- Quite comfortable
- Not very comfortable
- Not at all comfortable
- Don't know

Q13. Thinking about your choice in the previous question, how much do you agree or disagree with the following statements?
Response options: Strongly agree, Agree, Neither agree nor disagree, Strongly disagree, Don't know
- **Most accidents are caused by human error so autonomous vehicles would be safer**
- **Autonomous cars could malfunction (R)**
- **I would miss the enjoyment of driving (R)**
- **I would feel uncomfortable if I wasn't in control of my car (R)**
- **I would take the opportunity to do other things while the autonomous car takes care of the driving**
- **It would make no difference to me whether I was in control of the car or not**
- **Riding in an autonomous car would be easier than driving myself**
- I don't know enough about how autonomous cars work

Q14. How well do you think autonomous cars would handle these situations?
Response options: Very well, Quite well, Not very well, Not at all well, Don't know
- Motorways
- Roads in cities or large towns
- Small roads in the countryside
- Roundabouts or other intersections
- Roads with temporary obstructions (such as roadworks or parked vehicles)

Q15. And how would you feel about autonomous vehicles more broadly being developed for the following purposes?

Response options: Very positive, Positive, Neither positive nor negative, Negative, Very negative, Don't know

- Public transport, such as buses
- Commercial transport, such as large lorries or trucks carrying goods
- Emergency vehicles, such as ambulances
- Helping people travel if they have physical disabilities and cannot drive a regular car
- Helping people travel if they have committed driving offences and have been banned from driving

For Questions 16-20 we employed another split ballot experiment. Half of respondents were randomly allocated to the sequence below (Q16, Q17, Q18, Q19, Q20). The other half were allocated to the sequence Q18, Q16, Q17, Q20, Q19.

Q16. Imagine you are driving on a two-lane street or road in your own usual car (indicated by the white car in the diagram). A delivery truck has stopped and blocked the other lane, and traffic is busy in both directions.
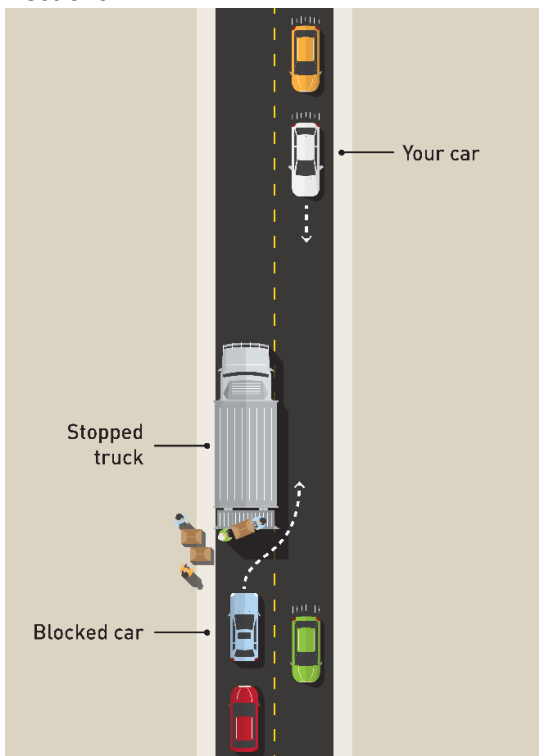
With the traffic in the oncoming lane blocked, how would you respond?

Response options: Always, Usually, Sometimes, Occasionally, Never, Don't know

- I would slow down, or stop, to let oncoming vehicles pass around the truck in front of me
- I would keep driving, because it is my right of way
- I would keep driving if I could see in my rear-view mirror that there is a gap behind me
- I would help the car if it didn't inconvenience me
- I would communicate e.g. by flashing my headlights to tell the car to come through

Q17. Would any of the following factors make it more or less likely that you would help the oncoming traffic?

Response options: More likely to help, Would make no difference, Less likely to help, Don't know

- If instead of a queue there was only one vehicle that needed to pass the truck
- If I thought that the oncoming traffic was getting badly held up
- If I had recently been held up on my journey

Q18. Now imagine you are in the lane which is blocked, as in the diagram below.
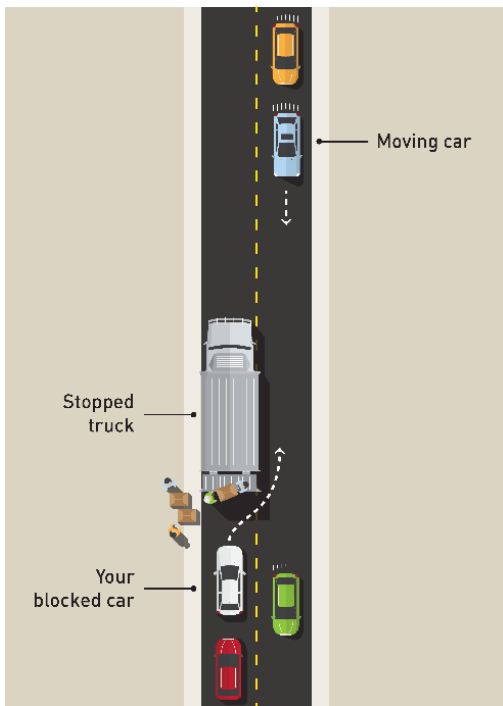
How would you get round the truck?
Response options: Always, Usually, Sometimes, Occasionally, Never, Don't know

- I would wait until there was a clear gap in the oncoming traffic
- I would nudge out into the oncoming traffic lane to encourage people to let me through
- I would try to make eye contact with an oncoming driver to get them to let me through
- I would be annoyed if the moving car did not let me out

Q19. Now imagine that you are in the blocked lane, and the oncoming moving car is an autonomous (driverless) car, as in the diagram below.
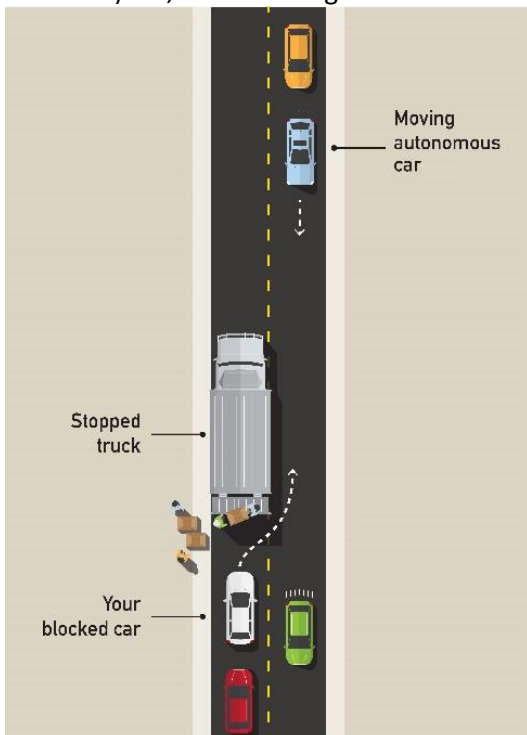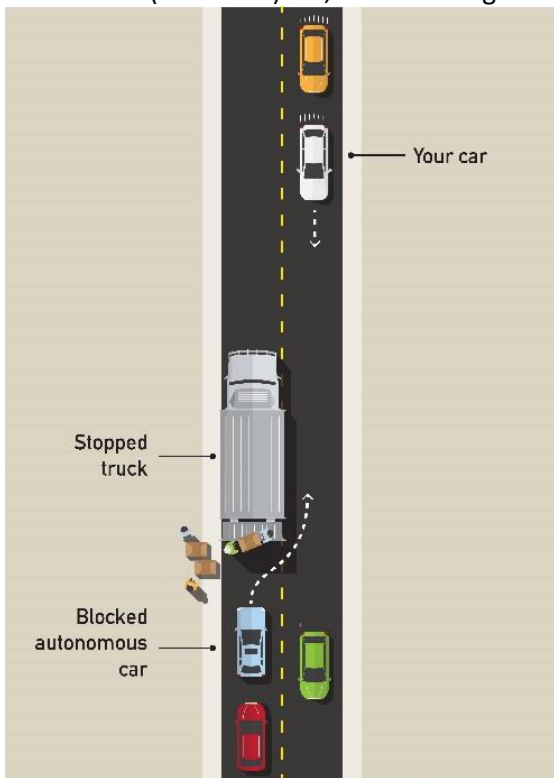

To what extent do you agree or disagree with the following statements?
Response options: Strongly agree, Agree, Neither agree nor disagree, Strongly disagree, Don't know

- I would be annoyed if the autonomous car did not let me proceed
- It would be easier for me to get around the truck
- The autonomous car ought to keep moving because it has the right of way
- If I nudge out the autonomous car ought to stop to let me proceed
- If a driverless car lets me proceed in this situation, I would be more likely to help another vehicle progress in a similar situation.

Q20. And now, please imagine that you are in the moving traffic, and the car at the front of the queue is an autonomous (driverless) car, as in the diagram below.

To what extent do you agree or disagree with the following statements?
Response options: Strongly agree, Agree, Neither agree nor disagree, Strongly disagree, Don't know

- I would not help an autonomous car
- I would behave in just the same way as with any car
- The autonomous car ought to wait for a gap to move out
- The autonomous car ought to be programmed to communicate with me to ask to be let out
- The autonomous car may be stuck there for a long time
- I would be annoyed if I was in the car behind the autonomous car

Q21. Now we would like to ask you some questions about using navigation systems on a mobile phone or SatNav device. How often, if at all, do you do any of the following?
Response options: Always, Usually, Sometimes, Occasionally, Never, Don't know

- I use navigation systems to monitor traffic conditions and journey times
- I use navigation systems when I am driving an unfamiliar route
- I consult a map when I am driving an unfamiliar route
- I keep to the route instructed by the navigation system
- If the navigation system advises a change in route during the journey (for example, to avoid traffic congestion), I follow the new route

Q22. Autonomous vehicles will need to be controlled by satellite communications, and by traffic management systems that gather information about vehicles on the road. Eventually, traffic management systems might be able to send signals to both driverless cars and cars with human drivers. They might, for example, send different navigation instructions to different vehicles on the same route, in order to spread congestion and manage traffic flow. To what extent do you agree or disagree with the following statements?
Response options: Strongly agree, Agree, Neither agree nor disagree, Strongly disagree, Don't know

- I would find information about the movement of other cars useful
- Traffic management systems for autonomous cars should not collect information from human-driven vehicles
- I don't want satellites tracking my movements
- I would welcome the traffic management system choosing my route for me
- It would be wrong for traffic management systems to require changes in behaviour from human drivers
- It would be useful for me to be able to access information from the system, e.g. to see where my family members are on the road
- I worry about these systems being hacked or malfunctioning

Q23. If you were using an autonomous car instead of driving yourself and didn't have to pay any attention to the road, would you spend your time doing any of the following?
Response options: Definitely, Probably, Probably not, Definitely not, Don't know

- Working
- Doing things related to family, friends or leisure
- I would prefer to keep aware of the road around me

The next question is asked as long as answers here are not 'definitely not' to both 'Working' and 'Doing things related to family, friends or leisure' – i.e. if respondents indicate that they might choose to do something other than driving.

Q23a. Which, if any, of the following things might you do? Please tick all that apply.

- Reading
- Emailing
- Texting or telephoning
- Browsing the internet
- Watching video content
- Sleeping
- Talking to other passengers
- None of these things

Q24. Imagine you are using an autonomous car instead of driving yourself. In what circumstances would you want to override the system and take control of the vehicle? Please tick all that apply.
Response options: Always, Usually, Sometimes, Never, Don't know

- On country roads
- On motorways
- Approaching junctions and roundabouts
- In areas where there are many pedestrians, e.g. near schools
- Overtaking
- When I want the enjoyment of driving
- When I have passengers in the car

Q25. Which of the following characteristics do you think autonomous cars should have? Do you think they should...(please tick all that apply)

- be environmentally friendly?
- be high performance?
- be able to communicate with other vehicles?
- be powered electrically?
- be fully autonomous, requiring no driver intervention (other than setting a destination)?
- be suitable for a car sharing scheme?
- be monitored remotely by the manufacturer in order to manage its maintenance?
- not need to have any of the above?

Q26. And do you think they should have any of the following special features? (Please tick all that apply)
- Smart tyres (with intelligent sensors capable of assessing road and weather conditions)
- Cybersecurity/anti-hacking features
- An internet connection
- Privacy features to protect driver anonymity
- A steering wheel to allow the driver to override the system and take control of the vehicle
- Advanced safety features to protect pedestrians
- None of the above

Q27. Thinking of the motor vehicle you drive most often, how old is it (in years)?

The 'technology in car' scale is comprised of items in Q28, with one point assigned for every box ticked, and the sum of those points comprising the final scale score for each respondent.

Q28. Thinking of the motor vehicle that you drive regularly, please tick the boxes to tell us which features it has, which ones you use, and your opinions of them.
Response options: My car has this feature, I use this feature regularly, I am glad my car has this feature, I wish my car had this feature
- Cruise control
- Proximity warnings
- Other parking assistance
- Lane keeping assist
- Lane change assist
- Automatic gear change
- SatNav (satellite navigation) including phone apps.
- Tyre pressure monitoring system
- Automatic lighting controls
- Engine stop/start when stationary

Q29. Having thought about autonomous cars by answering the questions in this survey, how would you now say you feel about driving on roads alongside autonomous (driverless) cars?
- Totally comfortable
- Quite comfortable
- Not very comfortable
- Not at all comfortable
- Don't know

Q30. And how would you feel about using an autonomous (driverless) car instead of driving a traditional car?
- Totally comfortable
- Quite comfortable
- Not very comfortable
- Not at all comfortable
- Don't know

To finish, please tell us a little about yourself.

Q31. What is your gender?
- Male
- Female
- Other

Q32. How old are you? Please type your age in years below.

Q33. And finally, how (if at all) have your opinions about autonomous cars changed since answering the questions in this survey?
- I feel more positive about them
- I feel more negative about them
- My opinion hasn't changed
- I feel I need more information about them in order to decide what I think