Motonormativity: How social norms hide a major public health hazard

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26   **Abstract**

Decisions about motor transport, by individuals and policy-makers, show unconscious biases due

28   to cultural assumptions about the role of private cars - a phenomenon we term motonormativity. To

explore this claim, a national sample of 2157 UK adults rated, at random, a set of statements about

30   driving ("People shouldn't drive in highly populated areas where other people have to breathe in

the car fumes") or a parallel set of statements with key words changed to shift context ("People

32   shouldn't smoke in highly populated areas where other people have to breathe in the cigarette

fumes"). Such context changes could radically alter responses (75% agreed with "People shouldn't

34   smoke... " but only 17% agreed with "People shouldn't drive... "). We discuss how these biases

systematically distort medical and policy decisions and give recommendations for how public policy

36   and health professionals might begin to recognise and address these unconscious biases in their

work.

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Keywords transport; sustainability; active travel; physical activity; public health; unconscious bias;

40   prejudice; decision-making; cultural influences

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Here in the United Kingdom, like in many societies around the world, we are in the midst of

46   environmental degradation and no fewer than three parallel health epidemics thanks to the easy

hypermobility (Adams, 2001) afforded by private motor vehicles. We have an epidemic of

48   collisions, with 1752 deaths and 25,945 serious injuries in 2019, the last year before the Covid

pandemic (DfT, 2020); we have an epidemic of physical inactivity – responsible for 22-23% of

50   coronary heart disease, 16-17% of colon cancer, 15% of diabetes, 12-13% of strokes and 11% of

breast cancer (World Health Organisation, 2002) – despite 24% of car trips being under 2 miles

52   and so mostly amenable to walking or cycling (DfT, 2022); and we have an epidemic of pollution,

with vehicle exhaust fumes causing cancer (Raaschou-Nielsen et al., 2013), heart disease (Hoek

54   et al., 2013) and diabetes (Rao et al., 2015) at such levels that estimates have put the UK air

pollution death toll at 40,000 per year (Royal College of Physicians, 2016). Even a future switch to

56   electric vehicles would address only one of these three epidemics (Walker & Bösehans, 2016). It is

clear we must acknowledge a simple fact: *transport issues are not just environmental issues: they*

58   *are also inherently public health issues.*

60   A society's ability to tackle any public health or sustainability issue appropriately will depend on

people at all levels – from policy makers to medical practitioners to the general public – being able

62   to judge the situation rationally and objectively. Overestimating or underestimating the seriousness

of an issue can lead to panic or complacency respectively. We suggest that, in the specific context

64   of individual motor transport, we have a cultural inability to think objectively and dispassionately.

This arises because of shared, largely unconscious assumptions about how travel is, and must

66   continue to be, primarily a car-based activity. We label this phenomenon *motonormativity*. This

term is chosen to draw parallels with other problematic cultural expectations such as

68   heteronormativity (e.g., Kitzinger, 2005). In heteronormativity, majority heterosexual people

automatically, but inappropriately, assume all other people fit their own categories and thereby fail

70   to accommodate the needs of minority groups (e.g., a school that specifically asks for 'mother's

name' and 'father's name' fails to accommodate same-sex couples). In extreme cases, such normalities can lead to minority groups being obliged to live according to the practices of the majority even when this goes against their will.

Motonormativity, in a similar way, leads to such issues as town planning predicated on the assumption that access will be by car, and to the minority who choose not to use cars being forced to accept the harms arising from other people's motoring whether they like it or not. Critically, at the level of the individual, we suggest motonormativity leads people who are thinking about the specific topic of driving systematically to suspend the ethical and moral judgements that they would apply in other contexts. This sort of double-standard is at the core of the public health challenge we wish to raise here.

One place we can easily see motonormative double-standards is the widespread acceptance of law-breaking... provided it is law-breaking by drivers. Speeding, for example, is an illegal behaviour practised by most drivers[1] that is widely indulged by the public, the media, and the justice system (road.cc, 2011). The treatment of speeding and dangerous driving can be contrasted with other infringements of law that are much more socially disapproved, such as littering, graffiti, public drunkenness, or street-noise (unless that noise comes from motor vehicles, of course – Davies & van Kamp, 2011; Walker et al., 2016). But if motonormativity were just the casual acceptance of illegal and antisocial behaviour we would be writing for a criminological audience; perhaps more serious is that motonormative thinking is also endemic in the medical and sustainability worlds and their surrounding policy spheres. It is at the root of how we address vulnerable road user injury by asking what the victims were wearing (Miller et al., 2010; Olivier et al., 2014) rather than why they were expected to mix in the first place with vehicles carrying thousands of times more kinetic energy; it is why we permit essential facilities to be placed in out-of-town locations (e.g., Ahmed et al., 2001) when millions of UK homes have no car (DfT, 2021); it is why the UK government bans

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1 In Great Britain in 2015, 84% of cars were found to be exceeding the limit on 20 mph (30 kph) roads and 52% of cars were speeding on 30 mph (50 kph) roads (DfT, 2016c).

smoking inside cars to protect children's health while ignoring the toxins and particulates inside

98   those same cars from engine emissions (Kaur et al., 2007); and (to return to public health) a

motonormative mindset is why general practitioners routinely ask their patients about diet, smoking

100 and drinking, but never about how they travel – despite us long knowing that this is a better

predictor of early mortality (Andersen et al., 2000).

102

We expand all these ideas and explore their implications in the Discussion section below. But first,

104 we wish more systematically to demonstrate our claim that normal standards of judgement can be

altered in the specific context of motoring. Using a national opinion poll with a large sample, we

106 devised five simple questions about motoring and then changed one or two key words in each so

that we had a parallel set of questions where the underlying principle was identical, but now

108 referred to a non-motoring context. If people's judgements were made by rationally applying

general principles, the change in wording should not matter and the motoring and non-motoring

110 contexts should be judged equivalently. But if people treat motoring differently from other topics,

we should expect systematic differences when judging the motor-focused versions.

112

114 **Method**

Participants

116 2157 members of the UK public (1025 male, 1132 female) participated in this study. These were

adults who had previously agreed to be approached from time to time by an independent market

118 research company, YouGov. Our questions were administered as part of a wider package on 12-13

October 2016. Participants received reward points for taking part, as part of their ongoing

120 arrangement with YouGov, and these could later be exchanged for cash rewards or prize draws.

Participants were informed about the study in advance and when signing up had been told that

122 participation was voluntary and anonymous. YouGov's surveying method aims to provides an age,

gender, working status, marital status and regional breakdown representative of the whole UK

124 population. Full or provisional driving licences were held by 1828 participants and 316 had no

licence. When asked about personal driving, 1509 said they drove a motor vehicle once a month or

126   more and 648 did not.

128   *Materials*

Five questions were constructed to ask about facets of motoring behaviour. These were chosen to

130   cover a range of motoring issues in a way that allowed one or two key words to be changed to alter

the subject of the question to a non-motoring domain. The questions were initially selected by the

132   authors to cover a range of health and risk issues related to driving, and the question forms were

refined in discussion with the opinion pollsters. The two parallel sets of questions are shown in

134   Table 1.

136   **Table 1 – Survey questions used to compare five underlying principles in motoring and non-motoring contexts**

138

Motor transport form	Non-motor transport form
If somebody leaves their **car** in the street and **it gets** stolen, it's their own fault for leaving **it** there and the police shouldn't be expected to act	If somebody leaves their **belongings** in the street and **they get** stolen, it's their own fault for leaving **them** there and the police shouldn't be expected to act
It's okay for a **delivery driver** to bend a few health and safety rules in order to keep their business profitable	It's okay for a **chef** to bend a few health and safety rules in order to keep their business profitable
Risk is a natural part of **driving**, and anybody **driving** has to accept that they could be seriously injured	Risk is a natural part of **working**, and anybody **working** has to accept that they could be seriously injured

Motor transport form	Non-motor transport form
There is no point expecting people to **drive** less, so society just needs to accept any negative consequences it causes	There is no point expecting people to **drink alcohol** less, so society just needs to accept any negative consequences it causes
People shouldn't **drive** in highly populated areas where other people have to breathe in the **car** fumes	People shouldn't **smoke** in highly populated areas where other people have to breathe in the **cigarette** fumes

140 *Procedure*

This study was approved by the University of Bath Psychology Ethics committee (reference 16-

142 178). Participants were randomly allocated to receive the motor form of the questionnaire (1053

people) or the non-motor form (1104 people). As noted above, the questions were presented

144 amongst a wider set administered as part of a regular panel survey process.

146

Results

148 The responses to the motor and non-motor forms of the questions are shown in Figure 1.

Legend: Strongly agree, Agree, Neutral, Disagree, Strongly disagree

(Ai) If somebody leaves their **car** in the street and **it gets** stolen, it's their own fault for leaving **it** there and the police shouldn't be expected to act
4% 1% 9% 55% 32%

(Aii) If somebody leaves their **belongings** in the street and **they get** stolen, it's their own fault for leaving **them** there and the police shouldn't be expected to act
9% 8% 29% 23% 31%

(Bi) It's okay for a **delivery driver** to bend a few health and safety rules in order to keep their business profitable
7% 2% 12% 45% 34%

(Bii) It's okay for a **chef** to bend a few health and safety rules in order to keep their business profitable
5% 2% 10% 52% 30%

(Ci) Risk is a natural part of **driving**, and anybody **driving** has to accept they could be seriously injured
13% 5% 15% 19% 48%

(Cii) Risk is a natural part of **working**, and anybody **working** has to accept they could be seriously injured
4% 20% 27% 20% 28%

(Di) There is no point expecting people to **drive** less, so society just needs to accept any negative consequences it causes
9% 11% 34% 20% 26%

(Dii) There is no point expecting people to **drink alcohol** less, so society just needs to accept any negative consequences it causes
4% 18% 24% 21% 34%

(Ei) People shouldn't **drive** in highly populated areas where other people have to breathe the **car** fumes
4% 16% 13% 31% 36%

(Eii) People shouldn't **smoke** in highly populated areas where other people have to breathe the **cigarette** fumes
4% 6% 14% 48% 27%

Figure 1 – Agreement with motor (N = 1053) and non-motor (N = 1104) question forms.

People responding 'Don't know' have been omitted (31 or fewer people per question)

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As Figure 1 shows, the clearest change emerges for the final question on smoking, where

156 switching from a car to non-car context dramatically shifted responses despite the underlying

principle being unchanged. The only question to show no substantial change was the "delivery

158 driver/chef" question, where the public were apparently opposed to businesses putting people at

risk for profit, whether driving or not. It is interesting to see the disparity between the "Risk is a

160 natural part of driving/working..." question forms, given that for millions of people, driving *is*

working.

162

For each form of each question, 'strongly agree' and 'agree' were collapsed to provide overall

164 agreement counts, and 'strongly disagree' and 'disagree' were collapsed to get overall

disagreement. A 2 (agree/disagree) × 2 (motor/nonmotor) chi-square test looked for patterns in

166 each question's responses, and where this was significant, two Bonferroni-corrected one-way chi-

square tests compared the proportion of people agreeing across the two question forms, and then

168 the proportion disagreeing. For the main five analyses, phi statistics (φ) are given as standardized

measures of effect size, and their magnitudes can be interpreted like correlation coefficients.

170

Question 1 showed a significant association between question form and response, $\chi^2(1) = 501.61$,

172 $p < .001$, $\varphi = .53$, meaning that responses were different across the two question forms. Follow-up

tests showed the two question forms differed on how much people agreed, $\chi^2(1) = 292.82$, $p <$

174 $.001$, and disagreed, $\chi^2(1) = 223.52$, $p < .001$. Question 2 showed no association between question

form and response, $\chi^2(1) = 1.45$, $p = .23$, $\varphi = .03$, showing the two question forms were treated the

176 same. Questions 3-5 showed the same pattern as Question 1, with significant overall effects and

significant differences between agreement and disagreement levels on every question. Question 3:

178 $\chi^2(1) = 214.94$, $p < .001$, $\varphi = .35$, agreement $\chi^2(1) = 100.53$, $p < .001$, disagreement $\chi^2(1) = 116.16$,

$p < .001$; Question 4: $\chi^2(1) = 83.83$, $p < .001$, $\varphi = .23$, agreement $\chi^2(1) = 36.15$, $p < .001$,

180 disagreement $\chi^2(1) = 49.73$, $p < .001$; Question 5: $\chi^2(1) = 671.11$, $p < .001$, $\varphi = .64$, agreement

$\chi^2(1) = 383.17$, $p < .001$, disagreement $\chi^2(1) = 292.45$, $p < .001$.

182

These analyses show that rewording the questions clearly changed how likely people were to

184 agree and disagree on every question except Question 2. In most cases the effects did not differ

as a function of demographics. The only places where there were substantial differences by

186 gender were:

188 • "Risk is a natural part of driving...", to which 65% of men agreed versus 55% of women, and

"Risk is a natural part of working...", to which 38% of men agreed but only 25% of women

190 • "It's okay for a chef to bend a few rules...", to which 10% of men agreed but only 4% of

women (the two groups responded the same to the motor form of the question)

192 • "There is no point expecting people to drink alcohol less...", to which 34% of men agreed

but only 20% of women (the two groups responded the same to the motor form of the

194 question)

196 The only question where agreement differed notably as a function of social class was "People

shouldn't smoke in highly populated areas...", where 82% of people in the higher ABC1 social

198 grades agreed compared to 67% in the lower C2DE grades (the two groups responded the same

to the motor form of the question).

200

Drivers (defined as people who drove a motor vehicle once a month or more) responded similarly

202 to non-drivers on all questions except "It's okay for a delivery driver to bend a few rules..." (8.4% of

drivers agreed versus 17.2% of non-drivers) and "People shouldn't drive in highly populated

204 areas..." (18.0% of drivers versus 31.4% of non-drivers agreed). Agreement between drivers and

non-drivers was very close on all the non-motor questions and levels of disagreement to the above

206 questions were comparable between drivers and non-drivers.

208

Discussion

210 Our survey showed that people can go from agreeing with a health or risk-related proposition to disagreeing with it simply depending on whether it is couched as a driving or non-driving issue. In

212 the most dramatic case, survey respondents felt that obliging people to breathe toxic fumes went from being unacceptable to acceptable depending on whether the fumes came from cigarettes or

214 motor vehicles. It is, objectively, nonsensical that the ethical and public health issues involved in forcing non-consenting people to inhale air-borne toxins should be judged differently depending on

216 their source, but that is what happened here. It seems that normal judgement criteria can indeed be suspended in the specific context of motoring, as we suggested.

218

Obviously, we used questions in this study that we felt would stand a good chance of

220 demonstrating a difference between how motoring and non-motoring issues were viewed. But choosing questions likely to reveal differences is not the same thing as stacking the deck. We gave

222 the social bias every chance to reveal itself, but that could only happen because it was out there to be revealed. Prentice and Miller (1992) argue that the ease with which a behavioural phenomenon

224 can be triggered is an index of its true magnitude. The ease with which effects appeared in this study was striking: in the final question the UK public went from 17% agreement to 75% agreement

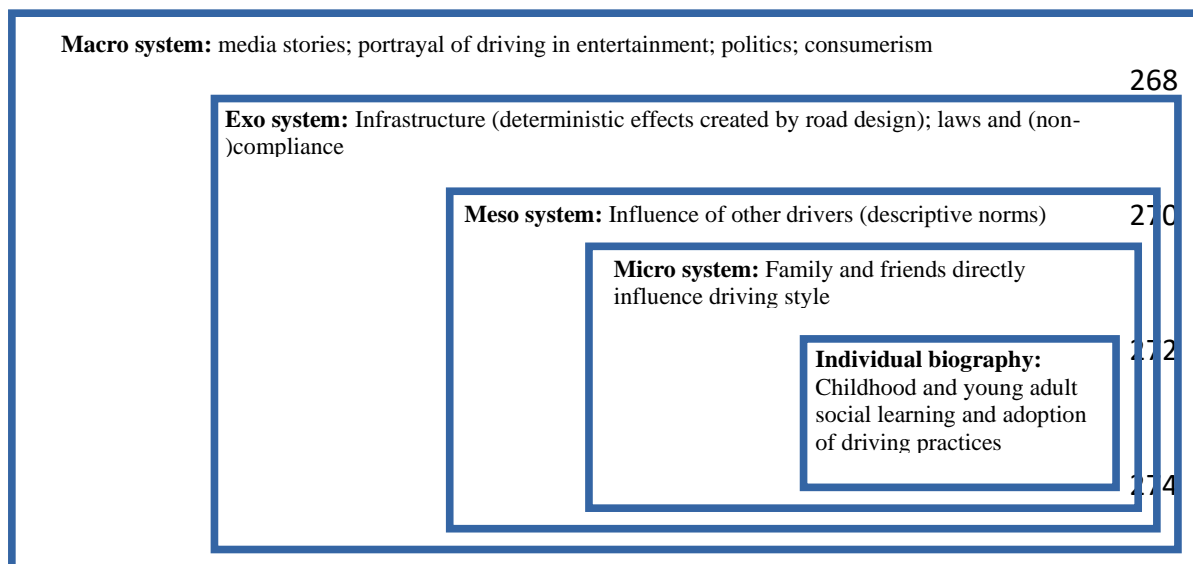226 just by changing two words in the question whilst leaving its underlying principle unchanged.

228 What is the mechanism underpinning these findings? One possibility we considered was that public acceptance of driving's problems might be an example of *pluralistic ignorance*, whereby

230 most people reject an idea in private but publicly express support on the (false) assumption that they are in the minority (Miller & McFarland, 1987; Walker, 2020). In this case, a pluralistic

232 ignorance explanation would be that most people feel uncomfortable knowing that driving harms or inconveniences others, but each person (perhaps because they routinely see such behaviour)

234 assumes they are unusual in feeling that way and so does not publicly express their true feelings.

11

By surveying people individually and privately, and asking questions they likely have not explicitly

236   thought about or discussed before, we hope we captured a reasonable estimate of the public's

private views and so can probably reject this explanation. Moreover, it is notable that the one

238   question not showing a difference between the motoring and non-motoring contexts (delivery

driver/chef) is the only one that does not refer to the everyday driving practices of ordinary people

240   (it concerns a special and identifiable subgroup of drivers). If the effects seen in the other four

questions arose because people excuse the sorts of driving actions done by themselves, or people

242   they associate with, then the lack of an effect in this professional driver question suggests people

are able to see the problem with dangerous or antisocial driving behaviour in the abstract, but only

244   when 'others' do it – all of which would be incompatible with a pluralistic ignorance explanation.

Finally, it is also notable that in most cases, people responded the same whether or not they were

246   themselves drivers. This implies that motonormative thinking is not just the assumption that

everybody else is like oneself; rather, the results are consistent with an even more extreme

248   situation in which minority non-drivers have internalised the mindset of the majority drivers.

250   Given all this, we believe the phenomenon seen here requires a psycho-socio-cultural explanation.

At the level of the individual decision-maker, the effect is the result of what psychologists call

252   *schemas* – organised packets of subject-specific knowledge that shape the way we perceive and

remember the world (Tesser & Leone, 1977). Schemas – preconceptions, in other words – have

254   widely been shown to affect judgements, and activating a particular schema in a person's mind in

advance of a judgement, and thereby influencing how that judgement is made, is the mechanism

256   underpinning *decision framing* (Simons, 2001).

258   But where do these schemas come from, and why are they so clearly shared across society to the

extent that many non-motorists gave us a motorist's perspective in this survey? These questions

260   can be answered if we view individual psychology as part of a wider framework of cultural and

social influences. Such an approach fits closely with the Social Ecological Model, first outlined in

262   the context of child development by Bronfenbrenner (1974). This account proposes that there are

12

multiple layers of influence stretching out from individuals, through families (micro system) to wider

264 societal structures (meso system), physical infrastructure (exo system) and national cultures

(macro system). Adapted to the context of driver behaviour, the model is illustrated in Figure 2.

266

Macro system: media stories; portrayal of driving in entertainment; politics; consumerism

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Exo system: Infrastructure (deterministic effects created by road design); laws and (non-)compliance

Meso system: Influence of other drivers (descriptive norms)   270

Micro system: Family and friends directly influence driving style

Individual biography: Childhood and young adult social learning and adoption of driving practices   272

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Figure 2 – The social ecological model, representing the multiple influences on an

278   **individual, presented here in the context of driving behaviour influences**

280 Figure 2 illustrates a mutually reinforcing multi-level series of influences that shape an individual's

views on driving, and thereby create a motonormative mindset. Specific examples might include:

282

- **Micro system:** Children observe that cars are commonly used even for short journeys;

284   they are given toy cars to play with; they absorb their parents' driving styles through

observation (Bianchi & Summala, 2004; Taubman-Ben-Ari et al., 2005)

286 - **Meso system:** Speeding, aggression and mobile phone use observed on the road are

internalised through descriptive norm processes (Cialdini, 1990)

288 - **Exo system:** Transport systems make car use easy, even for short journeys, by absorbing

externalities, subsidising parking, providing priority over other modes, providing ineffective

290   public transport alternatives; traffic safety laws are unambitious and poorly enforced

        (Voelcker, 2007); car design facilitates and normalises distracted driving (mobile

292   communication devices and entertainment) and potentially makes spaces outside the car

        feel threatening (Gatersleben et al., 2013)

294   • **Macro system:** Discourses and narratives about driving are shaped through

        representations in news media (which under-report traffic crashes and present them as less

296   important, and less preventable, than injuries from other sources); through advertising,

        which substitutes the reality of driving (congestion, unpredictable arrival times) for images

298   of pleasure and control; and through entertainment, which promotes dangerous and

        antisocial driving through the imagery of heroes in films (James Bond) and television (Top

300   Gear)

302   The specific influences outlined above will vary from one person to another, but the social-

        ecological approach provides a general account of how, as a result of the interplay between

304   individual psychology and wider social and cultural influences, motonormativity might be created

        and maintained such that our respondents applied different standards to driving and other activities

306   that are objectively comparable.

308   Naturally, we are not the first to view these issues from the outside; other people have commented

        how, were cars invented today, no device killing 35 people in the UK each week would be

310   permitted in our streets, however convenient. So another way to look at what we are talking about

        here is as an example of *normalization of deviance* (Banja, 2010) over the past century – or, in

312   more colourful terms, we find ourselves in the same sort of uncomfortable state as the slowly

        boiled frog. It is because every Westerner alive today knows only a world where motoring's

314   problems are the norm that is it so difficult to see with fresh eyes the issues with, for example, a

        system that demands one hundred pedestrians yield to one motorist, or with allowing children to

316   have toy cars whilst prohibiting toy guns, or with the first author's GP assuming he will drive to a

        pharmacy only 400 metres away...

318

And this final example brings us to our decision to publish in the *International Journal of*

320 *Environment and Health.* Our point is not just that the cultural lens of normalized car-centric

thinking exists, but also that it specifically masks environmental and public health crises like those

322 outlined at the start of this article by making the public *and the people who look after the wellbeing*

of the public apply inappropriate judgement criteria in areas with profound health implications. We

324 provided national-scale data from a large sample because it was important that the existence and

power of the phenomenon be shown as clearly as possible. Our call to action now is for decision-

326 makers to become aware of their own individual and institutional unconscious biases and how

these have health and quality of life implications for others. We each need to ask whether the

328 criteria we use when making a decision about transport would be applied equally if we were

looking at any other domain. For example, would we teach children that it is their responsibility to

330 dress properly to protect themselves from sex abusers, as we currently teach them it is their

responsibility to protect themselves from dangerous drivers (DfT, 2009; see also Roberts &

332 Coggan, 1994)? Obviously such reflexivity becomes increasingly important as we move from

individuals to policy makers.

334

Just as it was only through recognising shared unconscious prejudices that the UK's Metropolitan

336 Police began to address its problem with 'Institutional Racism' (Macpherson, 1999), national-level

institutions – perhaps above all the government and the medical profession – need to address

338 what our colleague Charles Musselwhite once termed the 'Institutional Car-ism' underpinning their

own thinking. Progress will start to be apparent when car adverts carry 'Please use responsibly'

340 warnings like adverts for alcohol or gambling, and when pedestrian crossings are redesigned so

that walkers no longer need to stop and ask permission to cross a road on which inactive and

342 polluting motorists are automatically given priority. The extent to which these suggestions currently

sound outlandish is an index of motonormativity, revealing the extent to which our society is failing

344 to apply objective and dispassionate risk analyses.

346 Our specific call to government and medical professionals is to begin (a) auditing all decisions from

the viewpoint of a person who does not drive and (b) incorporating the harms from motoring –

348 particularly physical inactivity and pollution – into day-to-day practice. Addressing (a) will involve,

amongst other things, viewing decision panels[2] that include no active-travel commuters with the

350 same suspicion we are beginning to apply to all-male or all-white decision panels; it might also

involve seeking systematically to recast all transport decisions into non-transport parallels, like we

352 did in our survey, to ensure the underlying principles are viewed objectively. Addressing (b) will

include treating inactivity arising from over-reliance on the car as a medical problem, somewhat

354 akin to prescription drug addiction (wherein patients similarly cause themselves long-term harm

through their over-use of a helpful agent); lobbying for reductions in traffic toxin and noise

356 emissions; and scrutinising patients' transport behaviours with the care currently given to arguably

less harmful lifestyle choices like alcohol and tobacco use.

358

360 **Conclusions**

Our ability to address the multiple harms arising from over-use of private cars will be determined by

362 our ability to judge these objectively. In this study, a large representative sample of the UK public

judged questions entirely differently depending on whether they were framed as driving issues or

364 non-driving issues, even though the underlying principles were identical in both cases. This

provides evidence of how driving automatically receives systematically biased treatment across

366 society so as to favour the needs of a majority – an effect we term *motonormality*. We argue that

our results arose because individuals have their views about motoring shaped over their whole

368 lifespan by a multi-level series of external influences ranging from observing their parents' driving

while growing up to mass-media discourses about how it is not only normal but even desirable to

370 drive short distances in antisocial styles. Finally, we suggest that this motonormative thought style

is as endemic amongst government and the medical profession as in the general population. This

372 means core public health and sustainability issues are being systematically neglected by

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2   This includes judicial decision panels.

16

policymakers. People within such roles need to recognise their own unconscious biases, to work

374 towards providing objective judgements of the consequences of travel and to build these into their

day-to-day work.

376

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