Motonormativity: How social norms hide a major public health hazard

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Abstract

Decisions about motor transport, by individuals and policy-makers, show unconscious biases due 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 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 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 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 and health professionals might begin to recognise and address these unconscious biases in their work.

Keywords transport; sustainability; active travel; physical activity; public health; unconscious bias; prejudice; decision-making; cultural influences

Motonormativity: How social norms hide a major public health hazard

Here in the United Kingdom, like in many societies around the world, we are in the midst of 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 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 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 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 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 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 are also inherently public health issues*.

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 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 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 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 heteronormativity (e.g., Kitzinger, 2005). In heteronormativity, majority heterosexual people automatically, but inappropriately, assume all other people fit their own categories and thereby fail 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

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 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 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).

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

Method

Participants

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 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 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 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 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 more and 648 did not.

Materials

Five questions were constructed to ask about facets of motoring behaviour. These were chosen to 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 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 Table 1.

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

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

Procedure

This study was approved by the University of Bath Psychology Ethics committee (reference 16-178). 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 amongst a wider set administered as part of a regular panel survey process.

Results

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

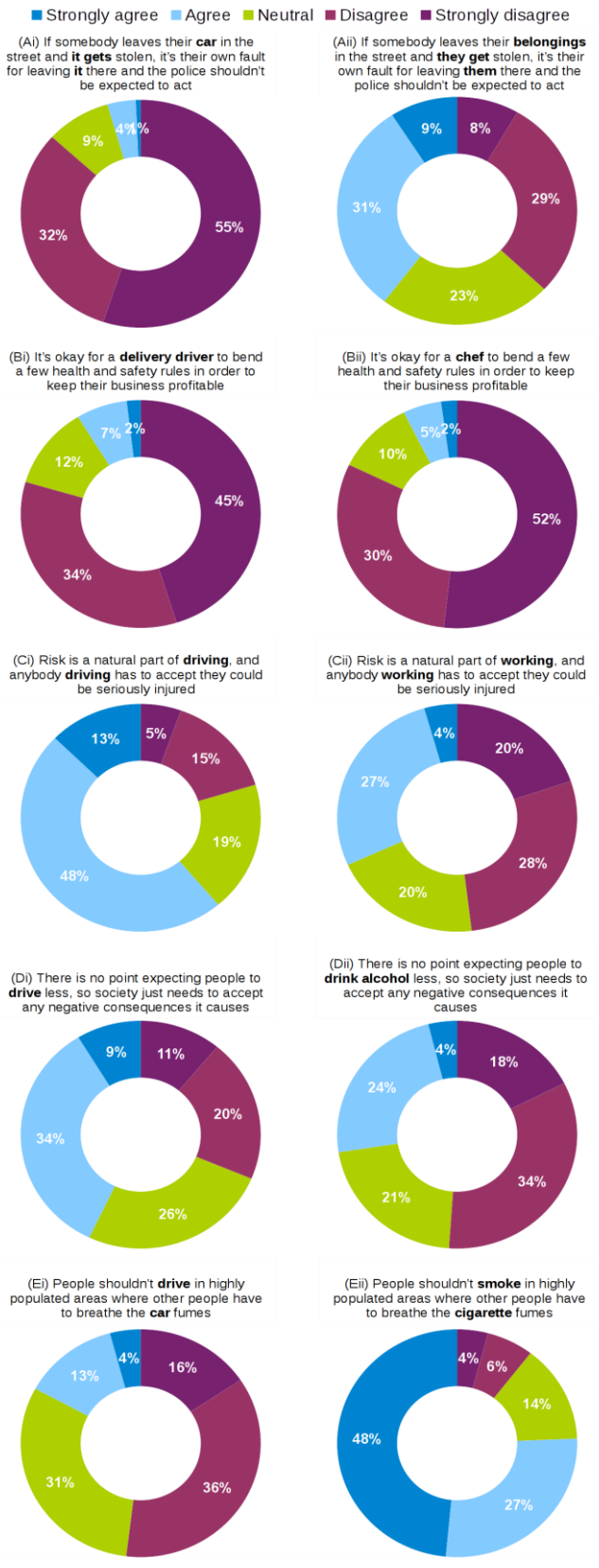

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Figure 1 – Agreement with motor (N = 1053) and non-motor (N = 1104) question forms.

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

As Figure 1 shows, the clearest change emerges for the final question on smoking, where 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 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 natural part of driving/working..." question forms, given that for millions of people, driving *is* working.

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

Question 1 showed a significant association between question form and response, $\chi^2(1) = 501.61$, $p < .001$, $\varphi = .53$, meaning that responses were different across the two question forms. Follow-up tests showed the two question forms differed on how much people agreed, $\chi^2(1) = 292.82$, $p < .001$, 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 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: $\chi^2(1) = 214.94$, $p < .001$, $\varphi = .35$, 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 $\chi^2(1) = 36.15$, $p < .001$,

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

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

- "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
- "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)
- "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 question)

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 grades agreed compared to 67% in the lower C2DE grades (the two groups responded the same to the motor form of the question).

Drivers (defined as people who drove a motor vehicle once a month or more) responded similarly 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 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 questions were comparable between drivers and non-drivers.

Discussion

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 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 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 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.

Obviously, we used questions in this study that we felt would stand a good chance of 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 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 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 just by changing two words in the question whilst leaving its underlying principle unchanged.

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

By surveying people individually and privately, and asking questions they likely have not explicitly 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 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 (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 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 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 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 situation in which minority non-drivers have internalised the mindset of the majority drivers.

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

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

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

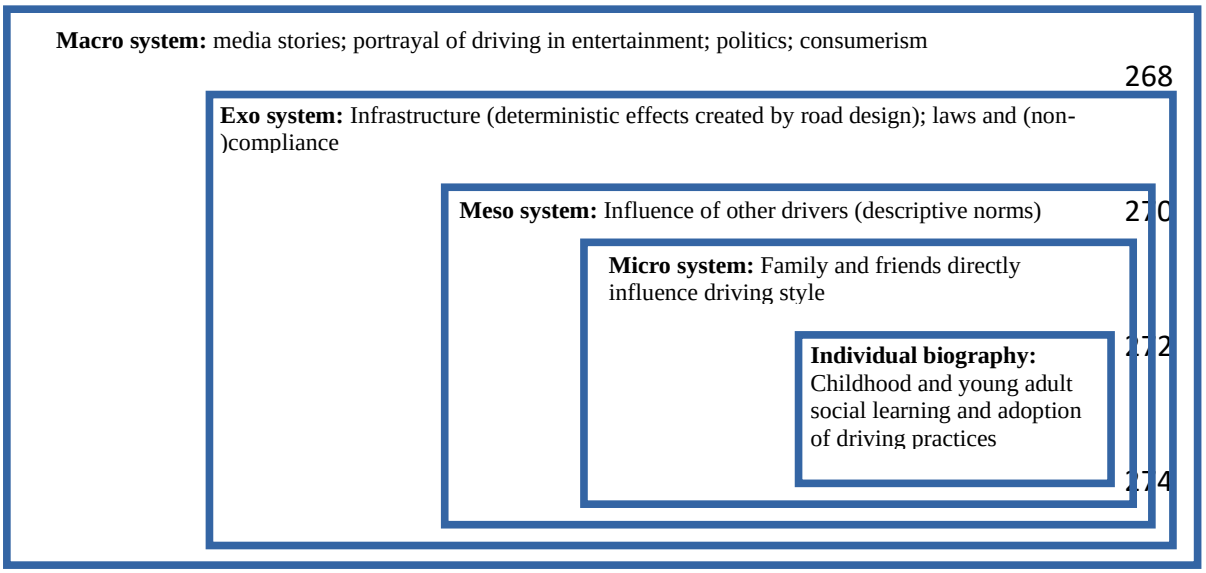

Figure 2 – The social ecological model, representing the multiple influences on an individual, presented here in the context of driving behaviour influences

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:

- **Micro system:** Children observe that cars are commonly used even for short journeys; 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)
- **Meso system:** Speeding, aggression and mobile phone use observed on the road are internalised through descriptive norm processes (Cialdini, 1990)
- **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.

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 – 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 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 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 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 emissions; and scrutinising patients' transport behaviours with the care currently given to arguably less harmful lifestyle choices like alcohol and tobacco use.

Conclusions

Our ability to address the multiple harms arising from over-use of private cars will be determined by 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 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 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 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 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 means core public health and sustainability issues are being systematically neglected by

2 This includes judicial decision panels.

policymakers. People within such roles need to recognise their own unconscious biases, to work towards providing objective judgements of the consequences of travel and to build these into their day-to-day work.

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