Electric vehicle drivers use better strategies to counter stereotype threat linked to pro-technology than to pro-environmental identities

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Abstract

Battery electric vehicles (BEVs) could play a crucial role in reducing greenhouse gas emissions around the world. Much research has examined the practical barriers to large-scale BEV uptake, but very little has examined the psychological barriers. The current study addresses this gap in the literature by investigating the effects of stereotype threat on BEV drivers. This psychological predicament occurs when an individual imagines or experiences being judged in terms of negative stereotypes about their social group. Qualitative thematic analysis of interview data revealed three distinct stereotypes that the BEV drivers imagined or reported other people to hold: eccentric, low-status environmentalists; hypocritical, high-status environmentalists; and geeky technophiles. With regard to the first and second stereotypes, drivers tended to use individualist defence strategies by downplaying their pro-environmental attitudes and dissociating themselves from the undesirable environmentalist groups. With regard to the third stereotype, they tended to use more constructive, group-level defence strategies by perceiving their BEV driver ingroup as superior on the innovative technology adopter dimension compared to their non-BEV driver outgroup. Suggestions are made for countering the psychological barrier of stereotype threat, such as promoting images of BEV drivers as future-shaping market leaders and treating them as members of an influential and desirable consumer group.

Keywords: electric vehicles; stereotype threat; consumer identity; environmentalists; technophiles; innovative technology adoption

Declarations of interest: none.

1. Introduction

The need to increase mainstream market uptake of electric vehicles (EVs) is becoming a major concern for governments around the world. New regulations to reduce greenhouse gas emissions that contribute to global warming require alternatives to vehicles powered by the traditional internal combustion engine (ICE). Pure battery EVs (BEVs) present a key solution for decarbonising the transportation sector. Widespread adoption would also improve local air quality by removing other harmful ICE tailpipe emissions (Department for Environment, Food and Rural Affairs [Defra] & Department for Transport [DfT], 2017). The UK government plans to end the sale of all new ICE cars and vans by 2040, and for almost every car and van to be a zero emission vehicle by 2050 (Defra & DfT, 2017). However, the number of non-commercial BEV cars (13,597) registered in the UK in 2017 formed only 0.54% of the total number of non-commercial cars (Society of Motor Manufacturers and Traders [SMMT], 2018a). This rose by just 0.03% in the first 6 months of 2018 (SMMT, 2018b).

An extensive body of research has analysed the practical barriers to BEV uptake, including high upfront purchase costs, limited driving range, and insufficient public charging infrastructure (DfT, 2016). The problem with these barriers is that they are easy to identify, but difficult to remove. This is partly due to a 'chicken and egg' situation (Office for Low Emission Vehicles, 2013, pp. 11, 31), whereby stakeholders are unwilling to make significant financial investments until a sufficient number of BEVs have been purchased, but the majority of mainstream consumers want to see these hurdles removed before considering a switchover to the unfamiliar technology. In comparison, psychological barriers to BEV uptake have received little attention. This is surprising, given that car choice is closely tied to issues of image and identity (Grubb & Hupp, 1968; Heffner, 2007; Sowden & Grimmer, 2009; Steg, 2005; Steg, Vlek, & Slotegraaf, 2001). People often make judgments about others

26 based on their choice of car, inferring their personality traits and social positions by drawing

27 on car owner stereotypes linked to certain types or brands (Belk, 2004; Grubb & Hupp, 1968;

28 Sowden & Grimmer, 2009). The current study addresses this important gap in the EV

29 literature. Specifically, it examines the perspectives of BEV drivers in a large-scale UK BEV

30 trial, who regarded BEVs as desirable on a personal level but often believed other people to

31 see BEV drivers in a negative light.

32   A very small body of research has touched on the topic of undesirable identities linked to

33 EVs (for overviews, see Burgess, King, Harris, & Lewis, 2013; Bennett & Vijaygopal, 2018).

34 EV drivers' own perceptions of undesirable identities emerged from interview data in the UK

35 (Burgess et al., 2013; Graham-Rowe, Gardner, Abraham, Skippon, Dittmar, Hutchins, et al.,

36 2012) and the US (Heffner, 2007). Although not the main focus of these studies, some BEV

37 or hybrid EV (HEV) drivers expressed concern that other people might see them as an

38 'eco warrior' (Burgess et al., 2013, p. 39), a 'tree-hugger' (Heffner, 2007, p. 407), a 'spinster

39 lady currently working in a library, hugging trees and going to public meetings about saving

40 the planet' (Graham-Rowe et al., 2012, pp. 147–148), or a 'socially-challenged geek'

41 (Heffner, 2007, p. 164). In most of these cases, the drivers did not appear to actually

42 encounter such stereotypes, but simply assumed that members of the public might perceive

43 them in this way.

44   Why would EV drivers make such assumptions? The above research did not answer this

45 question directly, although a number of UK EV drivers reported real-world interactions with

46 people who were sceptical about the cars, seeing them as strange, unviable, and inferior to

47 their ICE counterparts (Burgess et al., 2013; Graham-Rowe et al., 2012). These images

48 carried the implication that EV drivers were also regarded as strange and inferior. This view

49 is sometimes expressed in the media and social media, where EVs have been described as

50 'tools for fools' and their owners as 'not very bright' (Clarkson, as cited by Sunday Times

51   Driving, 2013, paras 9, 15). A survey of 445 residents of London found similar 'ingrained

52   negative associations' of EVs, alongside a general perception that they were a 'niche idea that

53   appeals to techy early adopters or the "super green"' (Transport for London [TfL], 2016,

54   pp. 23–24). These two distinct consumer categories are linked to multiple meanings, which

55   may be very positive for those who identify with either group, but may be associated with

56   negative stereotypes for those outside the groups.

57   To give an example of environmentalist stereotypes, one issue of *The Sunday Times*

58   *Magazine* (a publication renowned for high-quality journalism) focused on the topic of global

59   warming. Despite its strong emphasis on the need to address this problem, various articles

60   made reference to 'tree-hugging, soft-headed warmists'; 'dinner-party eco-warriors'

61   (Appleyard, 2009, pp. 12, 11); the 'eco-nutter'; the 'shouty mob of eco-protesters'; the 'green

62   fringe' (Hattersley, 2009, pp. 29, 31); and the 'eco-hypocrites' who go around 'spouting

63   green virtue but spewing out hundreds of tons of carbon from their private jets or multiple

64   holiday homes around the globe' (Foreman, 2009, pp. 52, 54). Although the authors

65   attempted to *disprove* these stereotypes, the use of such descriptions nevertheless functioned

66   to invoke and reinforce the impression that people with pro-environmental attitudes occupy a

67   unique social group that attracts and deserves a certain amount of ridicule. With regard to

68   technophile stereotypes, these are often based on the image of the 'geek', which can be

69   defined as 'a peculiar person . . . unfashionable, or socially awkward' (Dictionary.com, n.d.).

70   Rose (2003) described how a globally popular series of computer manuals continually

71   belittled IT experts by joking derisively about 'nerd programmers', 'techogeeks', and

72   'computer dweebs' who differ substantially from 'normal people' (p. 123).

73   Together, this evidence suggests that EV drivers (and potential EV drivers) face a

74   considerable psychological dilemma. Several studies propose that EVs may appeal initially to

75   people with strong pro-environmental or pro-technology attitudes (e.g., Axsen & Kurani,

76   2013; Egbue & Long, 2012; Heffner, 2007; Schuitema, Anable, Skippon, & Kinnear, 2013;

77   White & Sintov, 2017). Such individuals might see the psychological benefits of driving an

78   EV (e.g., feeling good about protecting the environment or being an early adopter of

79   innovative technology) to outweigh the practical barriers. However, this would be

80   undermined if drivers are simultaneously confronted with a belief that other people might see

81   them through the lens of a negative stereotype. The current study examines this dilemma by

82   drawing on the well-established theory of 'stereotype threat'.

83   *1.1. Stereotype threat*

84   Stereotype threat occurs when an individual imagines or experiences being judged and

85   potentially treated by others in terms of a negative stereotype about their social group, or

86   fears that they are confirming this stereotype in their own eyes or in the eyes of others

87   (Aronson, 2002; Steele, 1997; Steele, Spencer, & Aronson, 2002; see also Shapiro &

88   Neuberg, 2007, for discussion of the definition of stereotype threat). It evolved as a

89   microtheory of social identity theory, which examines intergroup relations and collective

90   behaviour (Tajfel, 1978; Tajfel & Turner, 1979). Stereotype threat can have a significant

91   impact on people's attitudes and behaviours in stereotype-relevant domains. It is a

92   predicament that affects a broad array of groups and domains of activity, and as everyone has

93   some form of social identity for which a negative stereotype exists, virtually everyone will

94   experience stereotype threat at some time (Aronson, 2002; Steele et al., 2002). It can be

95   activated by various types of situational cues, ranging from explicit discriminatory behaviour

96   to 'the mere threat of discrimination and devaluation implied by the perceived relevance of a

97   negative group stereotype' (Steele et al., 2002, p. 389). Individuals may experience different

98   kinds of stereotype threat, ranging from a brief sense of apprehension linked to a specific

99   activity to a continuous 'engulfing predicament' over a long time period (Steele et al., 2002,

100 p. 385).

101   The large majority of studies applying this theoretical framework have assessed the effect

102   of negative stereotypes on performance tasks (e.g., intellectual or athletic tasks), and found

103   that experience of stereotype threat generally decreases performance (see Pennington, Heim,

104   Levy, & Larkin, 2016, for a review). Many studies have shown, for example, that female

105   participants perform less well than males on mathematical tasks in contexts which trigger the

106   stereotype of women having poorer mathematical ability than men (e.g., Lesko & Corpus,

107   2006; Sekaquaptewa & Thompson, 2003; Spencer, Steele, & Quinn, 1999). A much smaller

108   number of studies have found that stereotype threat has a negative impact in other domains,

109   including healthcare decisions and outcomes (Abdou & Fingerhut, 2014), leadership

110   aspirations (Davies, Spencer, & Steele, 2005), and financial decision-making (Carr & Steele,

111   2010). Despite extensive research on the topic of stereotype threat, however, almost all

112   studies have used experimental or questionnaire methods, and focused on stereotypes linked

113   to stable and pre-determined identities such as gender and ethnicity (see Pennington et al.,

114   2016). This is surprising, given that stereotypes are prevalent in real-world environments, and

115   individuals have many flexible social identities that they have chosen to adopt. They also

116   engage in numerous activities that do not involve performance tasks, such as making lifestyle

117   choices and consumer decisions.

118   *1.2. Consumers and social identity theory*

119   A small number of studies have applied social identity theory to consumer attitudes and

120   behaviours (e.g., Sowden & Grimmer, 2009; White & Argo, 2009; White, Argo, & Sengupta,

121   2012; White & Dahl, 2007). Sowden and Grimmer, for example, analysed interviews

122   conducted with 22 drivers who had recently bought a new car, and found that many saw their

123   choice as a way of maintaining and promoting their social identity. They reported feeling

124   akin to other people who drove the same type of car, and compared themselves favourably to

125   drivers of different types of car, which they would *not* want to be seen driving. Similarly,

126   other studies have revealed how consumers tend to avoid products perceived as being linked

127   to social groups with which they do not want to be associated (e.g., White & Argo, 2009;

128   White & Dahl, 2007). However, these studies did not examine the specific phenomenon of

129   stereotype threat; they focused only on participants' responses to products felt to be linked

130   with social outgroups that conflicted with their existing social identities, such as an American

131   outgroup for Canadian participants (White & Dahl, 2007).

1.3. Study objectives

133   The current study therefore seeks to extend the existing research on EV uptake and

134   stereotype threat. It uses a qualitative approach to investigate a psychological barrier to BEV

135   adoption, and focuses on stereotype threat linked to real-world social identities that

136   individuals can choose to adopt or not adopt (in this case, BEV drivers, environmentalists,

137   and technophiles). It also examines naturally occurring stereotype threat over a time period

138   when it becomes salient, as opposed to when it is triggered at a specific time-point in

139   laboratory conditions or questionnaires. This naturally occurring form of stereotype threat is

140   greatly underexplored, yet potentially impactful. The interview data were collected from

141   BEV drivers participating in the UK's Technology Strategy Board (TSB) Ultra Low Carbon

142   Vehicle Demonstrator (ULCVD) programme (see subsection 1.4 for an overview; for full

143   details, see Carroll, Walsh, Burgess, Harris, Mansbridge, King, & Bunce, 2013). This trial

144   enabled drivers to integrate leased BEVs into their everyday lives and provide extensive

145   feedback on their experiences.

146   The study focuses on three research questions. As in much qualitative research, these were

147   refined over the course of the analysis (Creswell, 2012). RQ1: *To what extent do drivers*

148   *identify as environmentalists and/or technophiles?* This is an important issue, because some

149   studies have shown that individuals are more susceptible to stereotype threat when they

150   identify strongly with the threatened group or domain, but others suggest that strong

151   identification may help to overcome harmful consequences (Pennington et al., 2016; Steele et

152   al., 2002). RQ2: *Do drivers experience stereotype threat, and if so, what is the nature of the*

153   *threat?* The analysis initially looked for references to any kind of negative stereotypes, and

154   also considered whether the drivers' sense of stereotype threat was activated internally (in

155   their own minds) or externally (by other people). Both internally and externally activated

156   forms of stereotype were included in the analysis. RQ3: *What are drivers' defence strategies*

157   *towards stereotype threat?* 'Defence strategies' in this context refers to general attitude and

158   behaviour patterns rather than immediate, individual responses to specific triggers. Shapiro

159   and Neuberg (2007) argue that outcomes of stereotype threat other than decreased

160   performance, such as disengagement or disidentification with the negatively stereotyped

161   domain (Steele et al., 2002), are potentially more significant and likely to have longer-lasting

162   consequences. In addition, they are relevant to a wider range of social groups that are

163   stereotyped on grounds other than performance (Shapiro & Neuberg, 2007).

164   *1.4. Context of the study: The TSB ULCVD programme*

165   This project (2008–2012) was a large-scale ultra low carbon vehicle (ULCV) trial, jointly

166   funded by the TSB (now Innovate UK) and the UK's Office for Low Emission Vehicles. It

167   involved eight consortium groups positioned around England and Scotland, comprising

168   vehicle manufacturers, equipment producers, energy suppliers, university partners, and local

169   authorities. The project was intended to support the development of technologies and markets

170   for ULCVs, assessing drivers' perceptions and concerns in order to identify ways to improve

171   integration and optimise drivers' experiences. It provided a platform for the UK government

172   and consortium group members to evaluate the major facilitators and obstacles facing drivers

173   adopting ULCVs on a long-term basis.

174   Over 90% of the 349 ULCVs deployed were BEVs, and drivers were either corporate

175   (70%) or private (30%). Each consortium group recruited its own participants, handled the

176   distribution of BEVs, and provided appropriate training and support. Private drivers (the

177   focus of the current study) responded to advertisements in newspapers, flyers, and websites,

178   and applied for the programme by post or online. Successful applicants were assigned a BEV

179   for periods of 6–12 months, and most paid a monthly lease fee. Data were collected from

180   both the vehicles (through on-board data loggers) and the drivers (through interviews and

181   questionnaires). A research team in the Department of Psychology at Oxford Brookes

182   University collaborated with all consortium groups, designed interviews and questionnaires,

183   and collected data from over 300 private drivers between 2009 and 2012.

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185   **2. Method**

186   *2.1. Participants*

187   Participants were 53 private drivers in the TSB ULCVD programme. There were 39 men

188   and 14 women, with an age range of 23–71 years (Mean = 46.91, SD = 12.00). Additional

189   demographic details were provided by 24 of the 53 drivers; these are presented in Table 1.

190   These demographics are similar to those of the whole TSB dataset, in which drivers were

191   predominantly male, in their mid-40s, white, living with a spouse or partner, and had a

192   university degree (Carroll et al., 2013). Drivers came from three consortium groups, each

193   based in a broad area of England. They were assigned to one of four fully-electric BEV

194   models. This created five driver categories: (i) Consortium group 1, BEV A; (ii) Consortium

195   group 1, BEV B; (iii) Consortium group 1, BEV C; (iv) Consortium group 2, BEV A;

196   (v) Consortium group 3, BEV D. Car manufacturers in the TSB trial have allowed data to be

197   disseminated to a wider audience provided that specific BEVs are not identified in the results.

198   The sample size was felt to be optimal for gaining both breadth and depth of

199   understanding. Appropriate inclusion and exclusion criteria were applied. These focused

200   initially on vehicle type. Drivers of four BEV models that were relatively similar in terms of

201 size and performance were included. Drivers of other BEVs were excluded because the

202 vehicles were too different (e.g., vans or sports cars). The criteria then focused on the

203 interview data collected, and drivers who had not completed at least two interviews,

204 including the pre-trial interview, or had given insufficient responses, were excluded. This

205 narrowed down the potential dataset, but two driver categories significantly outweighed the

206 others. These were reduced by a process of random selection, designed to ensure that an

207 appropriate number of female drivers was included for the sample to be regarded as similar to

208 the TSB ULCVD programme private driver group as a whole in terms of gender. The final

209 sample comprised 8–12 drivers in each of the five driver categories (Mean = 10.6).

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221   Table 1

222   *Demographics for a Subset of Participants*

Category	Response				
Ethnic background	White		Mixed		
N = 23	96%		4%		
Marital status	Single	Married	Living with partner	Divorced/ separated	Widowed
N = 24	4%	67%	13%	12%	4%
Education level	GCSE/ equivalent	A-level/ equivalent	Graduate	Post-graduate	Other
N = 24	4%	29%	25%	33%	8%
On average, how often do you drive?	Every day		4–6 days per week		
N = 24	83%		17%		
How many hours per week do you spend driving?	Range	Mean		SD	
N = 22	2–20 h	8.91 h		3.97 h	

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224   *2.2. Procedure and interview schedule*

225   Interview data analysed in this study were collected at three time-points: pre-trial (in the

226   week preceding each driver's collection of their BEV), 1 week after collection of their BEV,

227   and 3 months after collection of their BEV. Due to the nature of the field trial, drivers of

228   different categories (i–v) were interviewed at different combinations of time-points: pre-trial

229   + 1-week (18/53); pre-trial + 3-month (8/53); pre-trial + 1-week + 3-month (15/53); 3-month

230   (12/53). A 'combined' schedule was used for drivers who were interviewed only at the

231   3-month stage, which included all questions from the pre-trial as well as the 3-month

232   interview. Questions from the pre-trial interview were put into the past tense, and reminded

233   drivers to reflect back on their pre-trial thoughts and feelings. Drivers were not primed to

234   think specifically about stereotypes or negative images, but some questions asked about their

235   perceptions of other people's attitudes (e.g., *What have other people's reactions been to you*

236   *driving your electric car and to the car itself?*), and about general barriers facing BEV drivers

237   (e.g., *What needs to be overcome for the successful widespread adoption of electric*

238   *vehicles?*). Data were initially analysed by driver category to ensure that no distinct patterns

239   emerged between categories. BEV type, consortium group, and interview time-points were

240   just two variables among many in the project (e.g., driver age, gender, occupation, and

241   location), and this study focuses on findings relevant to the wider BEV market rather than to

242   specific BEVs. All relevant information provided by drivers was analysed, regardless of the

243   questions used to elicit it.

244   The interviews were one-on-one and conducted over the telephone. The majority lasted

245   between 30–90 minutes. The semi-structured schedules were designed to cover a wide range

246   of topics, varying from the practical aspects of BEV usage to drivers' deeper, psychological

247   engagements with their cars. The main topics were: drivers' motivations and expectations of

248   the trial; perceived barriers and facilitators to BEV uptake; experiences of charging, driving,

249   and dealing with limited range; general and specific adaptation experiences; challenges

250   encountered and coping strategies used; other people's attitudes towards BEVs; and image

251   and identity issues. The interviewer prompted drivers to give specific examples in response to

252   the questions, and encouraged them to elaborate on their initial answers with follow-up

253   probes (Smith & Osborn, 2008). Interviews were transcribed verbatim, including all non-

254   verbal utterances (e.g., laughing, sighing) and vocal distractors (e.g., ums, ers).

255   *2.3. Data analysis*

256   Transcripts were analysed in accordance with the guidelines for thematic analysis (Braun

257   & Clarke, 2006, 2012). The current study evolved out of a broader investigation into issues of

258   image and identity related to BEVs, for which inductive (data-driven) analysis prioritised the

259   drivers' perspectives and identified 'undesirable stereotypes of BEV drivers' as a potential

260   theme. When the initial, broad research questions for this study were developed (RQ1: *Do*

261   *drivers feel that they are being stereotyped, and if so, in what way?*; RQ2: *What are drivers'*

262   *reactions to stereotypes?*) the process of thematic analysis was conducted afresh. It shifted

263   from an inductive to a deductive (theory-driven) approach when the main themes had been

264   established. The research questions were then refined and the theoretical framework of

265   stereotype threat was selected and applied (Braun & Clarke, 2006, 2012).

266   Early readings of the transcripts focused on pinpointing meaningful features of the data

267   which were firmly grounded in the drivers' statements, as this helped to ensure that themes

268   did not simply evolve out of extraneous preconceptions. The transcript annotations were then

269   coded and collated across the entire dataset, resulting in a list of semantic-level codes. These

270   codes were sorted and collated into potential themes and subthemes, a process which

271   involved clustering and re-clustering of codes in order to reflect clear and meaningful

272   patterns across the data. Potential themes and subthemes were reviewed and revised until they

273   met Patton's (1990) dual criteria of 'internal homogeneity' (meaningful coherence of data

274   within a theme) and 'external heterogeneity' (clear distinctions between each theme). This

275   phase focused on the latent, psychological meanings beneath the surface of the data. Due to

276   the subtleties and ambiguities of some of the drivers' statements (e.g., emotions

277   communicated, use of irony), the first author listened to interview recordings where necessary

278   to assess vocal nuances (e.g., tone, pitch, tempo, volume) and interpret the drivers' intended

279   and implied meanings. The selected themes and subthemes were then named and refined

280   further, in order to ensure that they captured the essence of both the data and the overall

281   narrative. This phase drew on in-depth, deductive analysis, and related data back to existing

282   literature and the theoretical approach.

283

284   **3. Results and Discussion**

285   This section comprises two main themes: *Environmentalist identities* and *Technophile*

286   *identities*. The initial, inductive analysis looked for references to any kind of negative

287   stereotypes, such as foolish over-spenders (Heffner, 2007) or 'sensible and boring' people

288   with slow-moving lifestyles (Graham-Rowe et al., 2012, p. 149), but all quotes directly

289   relating to stereotypes of social groups, as opposed to individual personality characteristics,

290   clustered into the above two categories. This suggests that while other stereotypes may have

291   existed, the environmentalist and technophile stereotypes were the main ones to affect the

292   drivers. Quantitative data in the form of numbers and percentages are presented to provide

293   clarity, expose complexities, and enable comparison within the participant sample (see

294   Maxwell, 2010, for discussion of advantageous use of numbers in qualitative research). They

295   are not intended to be generalised beyond the participant sample. Numerical identifiers were

296   assigned to drivers in order to maintain anonymity.

297   *3.1. Environmentalist identities*

298   *3.1.1. Did drivers identify as environmentalists?*

299   At pre-trial, almost all drivers (51/53, 96%) agreed that it was important to power cars in a

300   way that limited environmental damage. However, in response to open-ended pre-trial

301   questions asking them to indicate the most important reasons for participating in the trial,

302   only 16 drivers (30%) reported that protecting the environment had been a primary (6/53,

303   11%) or subsidiary (10/53, 19%) personal motivating factor. Analysis of the whole interview

304   dataset revealed that just 14 drivers (26%) made reference at any point to the 'green' image

305   of BEVs interacting with their individual identities in a positive way, either by matching or

306   enhancing their existing self-images. Three of these drivers (6%) implied that they perceived

307   themselves to be part of a 'green' social group, but this sense of support was undermined for

308   one driver who stated that even his pro-environmental friends viewed adoption of a BEV as

309   being a step too far. Together, these findings suggest that although the majority of drivers

310   liked to perceive themselves as being environmentally friendly *to some extent*, they did not

311   identify strongly as environmentalists.

312   *3.1.2. Stereotypes of environmentalists*

313   Shifting from the drivers' own points of view to their assumptions and beliefs about other

314   people's perceptions, over half (27/53, 51%) referred at some point in their interviews to a

315   form of undesirable environmentalist stereotype attached to the BEVs. Two opposing

316   categories emerged: the *Low-status 'green' identity* and the *High-status 'green' identity.*

317   Three drivers (6%) made reference to both categories, implying that different individuals saw

318   BEV drivers in different ways.

319   *Low-status environmentalists*

320   Twenty of the 53 drivers (38%) made reference to a low-status environmentalist

321   stereotype. Most of their comments were relatively light-hearted, but nevertheless carried the

322   impression that other people could judge and treat them as belonging to a stigmatised social

323   group. They felt that BEV adopters could be perceived by others as deviant 'tree-huggers'

324   (P17), 'eco-warriors' (P15, P22, P46), 'eco-freaks' (P11), and 'weird, freaky nutters' (P40)

325   who defied established social norms and embraced alternative 'hippy and green' ones (P43):

326   I think people see you as a tree hugger. . . . There's a bit of a difference between an

327   electric car and a Porsche, they're opposite ends of the [status] spectrum. (P17)

328   I suppose what's happened is that others – colleagues, neighbours, friends – have seen

329   me drive this car and their perception of me may have changed, they may think he's

330   an eco-warrior. (P22)

331   Nineteen of these 20 drivers spoke about how they *imagined* other people to view them, as

332   opposed to referring to actual encounters. Despite the fact that the majority of drivers did not

333   identify strongly as environmentalists, the act of simply driving a BEV seemed to trigger this

334   well-established stereotype in their minds.

335   The images evoked by the drivers were linked to impressions of radicalism, eccentricity,

336   and self-sacrificing frugality. This is in line with research findings that indicate how such

337   environmentalist stereotypes can be used by the public to alienate and denigrate people who

338   are felt to present a challenge to existing attitudes and behaviours (Hutchings, 2005;

339   Jorgensen, 2011). These stereotypes could function to reduce public cognitive dissonance

340   over pro-environmental behaviour by making BEV adopters look foolish and out of touch. In

341   addition, they may have appeared particularly absurd in the BEV context, as the idea of

342   clinging to trees and embracing an outdated 'hippy' mindset contrasts vividly with the image

343   of an early adopter of new vehicle technology. Only one driver reported encountering any

344   comments related to low-status environmentalists:

345   [Friends and family think] Oh [him] and his bloody electric cars, stuff like that!

346   [Laughter] You and your holier-than-thou go-kart, you're one of those eco-people!

347   That sort of thing. So I've had a bit of that. (P40)

348   The stereotype seemed to operate to a large extent in the drivers' imaginations, influencing

349   the ways in which they perceived, constructed, and attempted to project their own identities.

350   *High-status environmentalists*

351   On the other side of the status spectrum, 10 drivers (19%) indicated that BEVs were

352   associated with a high-status environmentalist stereotype. None of these drivers reported real-

353   world encounters, so the stereotypes appeared to exist in their own minds. They were often

354   linked to the adoption of EVs by film stars, but this connection with Hollywood was felt to be

355   'uncomfortable' as it implied that the BEV drivers were simply trying to show off their

356   altruism or copy US celebrities:

357   I think there's a kind of a . . . slightly uncomfortable feeling of 'holier-than-thou'. . . .

358   Like Hollywood stars driving [HEVs] . . . there is a little bit of wearing your

359   environmental heart on your sleeve. (P53)

360   There may be a bit of snobbery attached to it that says . . . "I am very environmental,

361   very switched on", oh, a new term I've heard – "environmental bling". [Laughter]

362   (P22)

363   These drivers seemed to fear that they might inadvertently confirm the sanctimonious

364   stereotypes in their own eyes, as well as in the eyes of other people. They also implied that

365   mainstream consumers would dismiss BEVs as a fashion statement or a passing fad, rather

366   than a viable, long-term transport option. They felt the high-status 'green' image to carry an

367   impression of pretentiousness and hypocrisy which they wanted to avoid:

368   Judging by the use of hybrid vehicles by the Hollywood set . . . I think a lot of these

369   actors and actresses like to improve their image by either pretending or actually doing

370   good deeds. (P45)

371   I bet you those people that say, "Oh yes it shows that we're fantastically

372   environmentally friendly", I bet you they take flights abroad frequently. (P43)

373   *3.1.3. Drivers' defence strategies for environmentalist stereotypes*

374   In the face of these two environmentalist stereotypes, the drivers tended to downplay their

375   environmental concerns. Despite the lack of real-world encounters, many appeared to have

376   internalised the stereotypes to the extent that they felt it necessary to create a defensive

377   understanding of who they were in relation to their BEVs. When they expressed pro-

378   environmental views, they were careful to make moderate and sensible statements such as,

379   'I'm fairly green' (P46) or 'We quite like to be green' (P26), which differed from the

380   passionate assertions made by many US HEV drivers who liked to wholeheartedly 'embrace

381   the image of environmental stewardship' (Heffner, Kurani, & Turrentine, 2005, p. 5). Seven

382   drivers in the current study (13%) defined their 'green' identities clearly in terms of what

383   they were *not*, wavering between endorsing pro-environmental attitudes and rejecting the

384   radical 'environmentalist' label:

385   I'm not a, you know, big sort of green environmentalist . . . I don't wear that big

386   badge, but I do my bit, you know, recycle . . . I'm probably a mediocre greenie rather

387   than a . . . "I'm out to save the planet". (P32)

388   I'm not an environmentalist . . . but . . . if you were an environmentalist, you'd think

389   you could sleep at night knowing that you're not polluting from carbon emissions.

390   (P24)

391   I asked for [the BEV] because I thought it was a great concept . . . not because I'm an

392   environmental egghead, just that I think it's a good solution. (P16)

393   A further three drivers (6%) indicated that EVs were only considered a high-status

394   environmentalist symbol by people who identified with this particular social group and had

395   positive images reflected back to them by other group members. They did not seem to know

396   any people like this, but nevertheless made clear that they did not regard themselves as

397   belonging to this category:

398   I suppose you could argue, yes, I'm an environmentalist, therefore I've got an electric

399   car. So yes, I think for some people they can be a status symbol. (P47)

400   I think [BEVs] probably are [a status symbol] to some people. . . . That is a lot of

401   money to park one on your driveway and say, "Look at me, I'm being really green". I

402   suppose for eco-warriors with massive budgets they are a bit of a status symbol. (P46)

403   Two drivers (4%) said that using a BEV was not a fixed or permanent environmental

404   commitment, but an identity that could be shrugged off if necessary. In other words, the

405   stereotypes appeared to prompt them to identify less strongly as BEV drivers:

406   I'm not doing it, it's not a religion, it's because I think it's the right thing to do, but if

407   it turns out to be the wrong thing to do then I'll stop doing it. (P26)

408   If the car is just a toy for an environmentalist to do their little one-mile journey in

409   every day then fine, that's where it'll be, and I can go and buy my high performance

410   sports car. (P43)

411   The stereotype threat literature would define these psychological defence strategies as

412   'disengagement' (a short-term, reversible response) or 'disidentification' (a long-term,

413   chronic response that involves a reconceptualisation of the self and of one's values) (Steele,

414   1997; Steele et al., 2002). They operate on an individualist level, in that the person who

415   experiences or anticipates stereotype threat acts to reduce the negative effects by dissociating

416   themselves from the domain in which the stereotype is relevant, or from the group at which

417   the stereotype is targeted (Pronin, Steele, & Ross, 2004; Steele et al., 2002). In the case of the

418   BEV drivers, they indicated that the domain of caring about the environment was not overly

419   important to them, or that they could even reject their whole BEV driver group membership.

420   One driver mentioned the possibility of engaging in highly counter-stereotypic behaviours by

421   switching to a fuel-guzzling ICE sports car, reflecting the actions of a HEV driver who

422   reported how he chose to drive at very high speeds to avoid being labelled a '"tree-hugger"

423   driving an econo-box' (Heffner, 2007, p. 175), and the hypermasculine, risk-taking

424   behaviours described by male drivers who felt threatened by a feminine image attached to

425   their ICE Porsche model (Avery, 2012).

426   Although these disengagement and disidentification strategies work to protect the

427   individual's self-esteem to some extent, they can be detrimental in other ways as they may

428   cause internal conflict and limit opportunities for self-development (Pronin et al., 2004;

429   Steele et al., 2002). In the BEV context, it would obviously be problematic for both

430   individuals and society at large if BEV drivers felt obliged to curb their pro-environmental

431   attitudes and behaviours, engage in counterstereotypic actions, and in the light of a largely

432   self-activated stereotype, persuade themselves and others to see protecting the environment as

433   a relatively insignificant action.

434   *3.2. Technophile identities.*

435   *3.2.1. Did drivers identify as technophiles?*

436   The term 'technophile' is defined in this study as 'a person who is interested in modern

437   technology and enjoys using it' (Cambridge Dictionary, n.d). In response to the open-ended

438   pre-trial questions, 24 drivers (45%) indicated that their interest in innovative technology had

439   been a primary (19/53, 36%) or subsidiary (5/53, 9%) personal motivating factor for

440   participating in the trial. This showed that more drivers were motivated by an interest in

441   innovative technology than by protecting the environment (16/53, 30%; 11% primary, 19%

442   subsidiary). Analysis of the whole dataset revealed that 36 drivers (68%) made clear

443   reference at some point to the innovative technology image of BEVs interacting with their

444   individual identities in a positive way, either by matching or enhancing their existing self-

445   images. Again, this was a much higher proportion than the 14 drivers (26%) who made clear

446   reference to this for the 'green' image. Eight drivers (15%) made clear reference to both the

447   innovative technology and 'green' images interacting with their identities in a positive way,

448   while 11 drivers (21%) did not make clear reference to either.

449   Twenty-four (45%) of the 36 drivers who identified as technophiles referred to acquiring a

450   new form of *social* identity, explaining how they felt 'involved in' or 'part of' something

451   special and unique and saw themselves as 'one of the privileged few' (P49). This stemmed

452   partly from the TSB trial itself, but only two drivers (4%) made explicit reference to

453   communicating with other participants. The majority referred primarily to a more abstract

454   and psychological sense of belonging to a group of BEV drivers who were helping to shape

455   the future:

456   I felt like a big part of it to be honest, and obviously speaking to [the interviewer] and

457   then answering the questionnaires . . . and the Facebook group [for trial participants]

458   as well, I think helped a lot to keep everyone together and what everyone experienced

459   then, so yeah there was a real sort of community feeling to it I thought, it was good.

460   (P41)

461   It's being part of evolving technology really, I mean, I think it's the way forward and

462   this is a good opportunity to be a part of it. . . . We're going to be . . . involved in

463   something in the future so, you know, it's great to be a part of it really at the outset.

464   (P47)

465   The emphasis on ground-breaking, future-shaping technology allowed these drivers to

466   distinguish themselves from more traditional technophiles (including ICE car lovers, often

467   described by the BEV drivers as 'petrolheads') who were generally resistant to BEVs.

468   *3.2.2. Stereotypes of technophiles*

469   Shifting from the drivers' own points of view to their beliefs about other people's

470   perceptions, 18 drivers (34%) referred at some point in their interviews to a form of

471   undesirable technophile stereotype attached to the BEVs. Fifteen of these drivers (28%) had

472   also referred to a form of undesirable environmentalist stereotype. The technophile

473   stereotypes fell into a single category which generally carried a low-status association.

474   The drivers in this category felt that other people could judge and treat them as socially

475   deviant, foolish, and risk-taking adopters of a peculiar form of technology. Six drivers (11%)

476   reported direct contact with people who held these opinions:

477   A lot of people that I spoke to about being part of the trial have all been . . . they just

478   had a good laugh about [me] having an electric car, "Oh it's going to be like a milk

479   float or a dodgems car", you know . . . they were all sort of quite detrimental of it and

480   it was a bit of a joke. (P07)

481   [Some people] think it's mad . . . because of the lack of range, and they may laugh

482   about the fact that I might find myself halfway down some sort of A road, standing on

483   the side, scratching my head because the battery's expired. (P50)

484   A further four (8%) mentioned encountering a few 'jokes' and 'sniggers' from colleagues and

485   friends. The remaining eight drivers (15%) spoke about how they imagined other people to

486   view them, with no reference to actual encounters.

487   The technophile stereotypes were sometimes linked to the image of outdated and

488   underpowered vehicles, but sometimes to the image of radically futuristic machines. Both of

489   these images carried the impression of impractical technology that any 'sensible person'

490   (P01) would view in a disparaging way. The drivers felt that they could be seen as a bit 'daft'

491   (P01, P07), 'silly' (P01, P05), 'dotty' (P26), 'stupid' (P10), or on a more humorous level,

492   'mad' (P01, P04, P17, P50):

493   I think [friends and family are] withholding judgement [on BEV technology],

494   basically. They think it's probably us being a bit dotty. (P26)

495   A further four drivers used the words 'geek' (P39), 'geeky' (P31, P46), or 'nerd' (P34) in a

496   relatively light-hearted way, evoking the stereotype of 'someone that's in early with

497   technology, does it really work, all that stuff, so a bit obsessive' (P40):

498   [My children] thought I was being a geek being on this trial, and my younger children

499   pretty well said, "I'm not coming out with you in that, Dad, I'm going to be so

500   embarrassed", and so they were fairly negative about it. (P34)

501   Six male drivers (11%) thought that some people perceived 'geeky' BEV drivers as

502   effeminate, favouring quirky technology over high-powered ICE cars:

503   I didn't worry that it undermined my identity as a male or whatever [but] I think there

504   would be a lot of men who wouldn't touch it with a barge pole for that very reason.

505   . . . Cars are such a macho thing for a vast majority of the driving public. . . . I think a

506   lot of blokes are cynical . . . they'll just argue with you and tell you it's a complete rip

507   off and accuse you of being stupid. (P10)

508   Men are a bit like, "Hey, come on . . . I need a flash car, it's an extension of my

509   personality" . . . [Laughter] . . . I just think when a woman sees it she'll just think…

510   *Hmmm* . . . A woman looking at you and a woman thinking *What a plonker* are two

511   completely different things. (P43)

512   This suggests that the technophile stereotype could be considered more detrimental by male

513   drivers, especially those who see ICE cars as a way of projecting the traditional image of

514   strong, prestigious, and desirable masculinity (Avery, 2012). Avery observed that in Western

515   culture, 'most men manage their masculinity through consumption to ward off fears that

516   others will see them as effeminate', and research suggests that using 'feminine' brands carries

517   greater stigma for men than using 'masculine' brands does for women (p. 323). Overall, these

518   technophile stereotypes shared similar characteristics to the environmentalist ones,

519   communicating the idea that BEV drivers belonged to a minority social group that warranted

520   a certain amount of derision.

521   *3.2.3. Drivers' defence strategies for technophile stereotypes*

522   In contrast to their defence strategies for the environmentalist stereotypes, drivers tended

523   to display more positive approaches in the face of imagining or encountering technophile

524   stereotypes. They often conceptualised other people's views as an enjoyable challenge:

525   Oh, the major challenge without a doubt is being good humoured when people are

526   rude to me! [Laughter] . . . The biggest challenge is going to be getting used to

527   people's reactions. . . . But that's fun, that's fun. (P01)

528   This appeared to enhance their self-esteem, allowing them to perceive themselves as strong

529   and resilient. Many drivers reported that with some effort and resilience, they were able to

530   transform people's views of BEVs as impractical or embarrassing technology over the course

531   of the trial:

532   [My children are now] 100% converted. . . . I didn't let that embarrassment put me

533   off, and so I did the school run from time to time. . . . When their friends started

534   saying, "Well, it's quite cool", they changed their opinion greatly. . . . The view of the

535   family has really, really changed. (P34)

536   They also indicated that they could reject the *stereotype*, as opposed to the domain or identity

537   to which it was associated. Five drivers (9%) used a certain degree of 'self-effacing humor

538   that confesses to, but spoofs, the allegation in the stereotype' (Steele et al, 2002, p. 434):

539   I think the reaction . . . at the [sports club] was, "He *really* has lost it!" The general

540   feeling on electric cars, in the circle that I'm in, is that they're not viable yet. . . .

541   [Friends] think that I shall be totally mad! They say, "What on earth do you think

542   you're doing?" They'll go home and say to their wives, "You won't believe what he's

543   done now!" (P01)

544   I've had the odd look, generally from very large SUV [sports utility vehicle] drivers,

545   the head shake, they do the head shake, and I'm trying to understand what that

546   emotion is but they just look at it and go, "Uchhh oh", as if they saw me wearing a

547   dress! [Laughter] "Oh, there's a bloke in a dress, oh!" (P40)

548   By laughingly imagining themselves being viewed as completely 'mad' or 'a bloke in a

549   dress', they exaggerated the stereotype to the extent that it became implausible and could

550   even be considered absurd. This approach carries the potential to reflect the negativity back

551   onto the stereotype holders by implying that they are the foolish people with a poor grasp of

552   reality.

553   Other drivers went a step further and indicated that they had psychologically assigned

554   non-BEV drivers to an inferior social group, applying a strategy that social identity theory

555   would define as 'social competition' (Tajfel & Turner, 1979, 1986). Drawing on their new

556   sense of social identity, they developed a sense of ingroup 'positive distinctiveness' (Tajfel &

557   Turner, 1979) and conceptualised ingroup members as more confident and forward-thinking

558   technology users than outgroup members. They saw themselves as being at the vanguard of a

559 global technology revolution, which distinguished them from mainstream consumers and

560 traditional technophiles who relied on technology rooted in the past:

561   I think there are lots of people out there who would be afraid of the change and

562   couldn't cope with that kind of open-mindedness and future-facing concept. (P15)

563 This allowed them to see themselves as distinctly superior to non-BEV drivers:

564   It's kind of cool to be involved in something cutting-edge, early adopter and all that.

565   . . . There is a little bit of fun in saying, "Look what I've got, you haven't got one of

566   these, hahaha!" (P50)

567   I feel quite sorry for poor mortals driving cars with engines in. (P11)

568 These drivers appeared to have engaged in complex internal dialogue, whereby they self-

569 activated the negative stereotype, imagined how other people might see them,

570 reconceptualised their sense of identity, and went on to envisage defensive responses to the

571 imagined stereotypes. These responses were not individualist but group-level strategies,

572 which caused the drivers to associate more strongly with their ingroup, and try to produce

573 real social change in the hierarchy of BEV driver/non-BEV driver groups. Their ingroup was

574 not a closed group, however, and the drivers did not display antagonism towards outgroup

575 members. They typically saw themselves as 'pioneers' (P14, P32) and 'one of the first' (P09,

576 P10, P15), implying that they were taking the lead and that the mainstream market would

577 soon start to follow their example. Many drivers embraced the real-world role of being

578 'ambassadors' (P11, P34, P51) and 'advocates' (P07, P15) for the BEVs, promoting the

579 benefits of the cars as much as possible and transforming the image of strange and unviable

580 gimmicks into that of exciting and efficient technology. These drivers believed that BEVs

581   would become the norm in the future, leaving non-BEV drivers as a devalued, outdated, and

582   minority social group.

583

584   **4. General Discussion**

585   The UK's TSB ULCVD programme was the world's largest multi-vehicle, multi-location

586   EV field trial, launched as a collaborative project with the specific intention of determining

587   ways to improve the likelihood of successful EV integration into the national fleet. The

588   current study's application of the well-established theory of stereotype threat to this real-

589   world test of innovative technological change has helped to elucidate potential obstacles and

590   facilitators to that integration. The findings revealed that the majority of drivers (30/53, 57%)

591   did appear to encounter stereotype threat, either through direct contact with other people

592   (11/53, 21%) or, more frequently, in their own imaginations like 'the threat of a snake loose

593   in the house' (Steele et al., 2002, p. 389). Despite their own positive views of BEVs and BEV

594   drivers, the act of simply participating in the trial seemed to trigger the stereotypes in many

595   of the drivers' minds, leading them to question their own identities and to anticipate or

596   assume that other people would see them as belonging to a stigmatised social group. This

597   suggests that stereotype threat poses a significant problem for BEV uptake. Although the

598   large majority of drivers reported that they enjoyed the experience of driving a BEV and

599   appeared to perceive the positive aspects of the BEVs as outweighing the negative

600   stereotypes, it is unlikely that this would be the case for mainstream consumers who

601   generally hold ambivalent or sceptical views of the vehicles (Burgess et al., 2013; Graham-

602   Rowe et al., 2012; TfL, 2016), and may see them as incongruent with their own personalities

603   (Skippon, Kinnear, Lloyd, & Stannard, 2016).

604   Despite the fact that fewer drivers indicated identification as environmentalists than as

605   technophiles, more drivers made reference to environmentalist stereotypes (27/53, 51%) than

606   technophile stereotypes (18/53, 34%). In addition, only one driver reported actual encounters

607   with negative perceptions of environmentalist BEV drivers, compared to the 10 drivers who

608   reported negative comments, jokes, or sniggers about technophile BEV drivers. This contrasts

609   with other stereotype threat research, which has found individuals to be more susceptible to

610   stereotype threat when they identify strongly with the threatened group or domain (see

611   Pennington et al., 2016; Steele et al., 2002). What could account for this difference? One

612   possible explanation is that the current study examined a *new* identity acquired by the

613   participants (i.e., BEV driver), as opposed to a pre-existing identity (e.g., gender or ethnicity,

614   as examined by most existing stereotype threat studies). In the consumer context, it is perhaps

615   the case that individuals who adopt a new product that is linked to both a desirable new

616   identity and a negative stereotype feel *more* threatened by the stereotype if they do not

617   identify strongly with the targeted group. In other words, the BEV drivers who did not

618   identify as environmentalists may have found it more incongruous and off-putting to

619   suddenly realise that they might be seen as 'tree-huggers' or 'eco-warriors with massive

620   budgets'. This suggests that stereotype threat operates in different ways in different domains

621   (i.e., performance domains and consumer decision-making domains), and would benefit from

622   more research in the consumer field.

623   The drivers also appeared to use different defence strategies towards the environmentalist

624   and technophile stereotypes. In the context of the former, they generally took the individualist

625   approach of psychologically dissociating themselves from the undesirable groups by

626   downplaying their environmental concern, or reminding themselves that they could discard

627   their whole BEV driver identity if necessary. In the context of the latter, they generally took

628   the group-level approach of 'social competition', identifying more strongly with their BEV

629   driver ingroup and considering it to be superior to their non-BEV driver outgroup. This

630   ingroup was a relatively abstract and psychological construct, as only two drivers made

631   explicit reference to communicating with other trial participants, but it seemed to offer a

632   strong source of internal resilience which many drivers subsequently translated into real-

633   world action by promoting their BEVs to members of the public.

634   What were the reasons for these different strategies? The fact that a larger number of

635   drivers identified as technophiles implies that they were perhaps more willing to invest effort

636   into confronting and transforming the 'geeky' stereotypes, both in their own minds and in

637   those of other people. They might have seen environmentalist stereotypes as more culturally

638   embedded and harder to contest, whereas technophile stereotypes are potentially more

639   flexible in an age that has seen an explosive uptake of consumer technology around the

640   world, with people becoming highly dependent on products such as computers and mobile

641   phones. The images of the BEVs may also have played a role; while the 'green' image was

642   based on abstract environmental credentials that were difficult to prove, the drivers seemed to

643   find it relatively easy to overcome images of BEVs as unviable technology by exposing

644   people to the cars and demonstrating their advantages.

645   However, the main reason appeared to be the emergence of a desirable form of social

646   identity for innovative technology adopters, which was mentioned by 24 drivers (45%). In

647   contrast, only three drivers (6%) reported being involved in a 'green' social community.

648   Feeling that they were part of a pioneering technology adopter team was a *new* form of social

649   identity, not dependent on prior technological expertise; simply by adopting a BEV, the

650   drivers were able to gain the psychological sense of belonging to a unique and trailblazing

651   group. This put them in a position where they could respond to the stereotype threat by

652   setting out to alter the relative positions of the BEV driver/non-BEV driver groups, as

653   opposed to using self-protective individualist strategies (Tajfel & Turner, 1979, 1986). While

654   this 'social competition' tactic has been discussed extensively in the domain of social identity

655   theory (Tajfel & Turner, 1979, 1986), stereotype threat research which has looked beyond

656   immediate performance outcomes has focused almost exclusively on self-limiting,

657   individualist strategies such as disengagement and disidentification (Aronson, 2002; Shapiro

658   & Neuberg, 2007; Steele at al., 2002).

659   With regard to implications for stakeholders engaged in the promotion of BEVs, this study

660   extended existing research which has identified negative images of EV drivers (Burgess et

661   al., 2013; Graham-Rowe et al., 2012; Heffner, 2007); by applying a theoretical framework, it

662   exposed how these were not simply images directed at individuals but more powerful

663   stereotypes targeting devalued social groups. The findings also suggested that a possible way

664   to counter this problem would be to advocate the image of an influential and desirable

665   innovative technology adopter group that would appeal to forward-thinking consumers. The

666   sense of being adventurous trendsetters at the forefront of a global change might also enable

667   such drivers to conceptualise other psychological barriers to BEV usage, such as

668   apprehension about recharging routines (Bunce, Harris, & Burgess, 2014) and 'range anxiety'

669   caused by limited driving range (Rauh, Franke, & Krems, 2015), as interesting, conquerable

670   challenges instead of intimidating responsibilities.

671   Potential real-world actions to promote the image of a desirable, pioneering BEV driver

672   group could involve a variety of advertising platforms, including the media, social media,

673   films, and television programmes. Support and publicity for BEV hire clubs, BEV enthusiast

674   clubs, and online communities could encourage BEV drivers and potential adopters to

675   exchange information, share experiences, and give and receive advice (see Le Vine, 2012, for

676   extensive discussion of different kinds of ICE car hire clubs in the UK). An accessible rather

677   than exclusive and elitist group image would be essential, and ventures such as BEV hire club

678   schemes could play a key role in allowing consumers to experience BEVs in everyday

679   situations without committing themselves to purchase. Personal contact with BEVs has also

680   been shown to be highly effective in transforming mainstream consumers' negative

681   stereotypes of the vehicles as strange and unviable into exciting and practical technology

682   (Burgess et al., 2013).

683   Alongside 'normalising' the image of BEVs and their drivers, however, an element of

684   distinction could also be beneficial to counter the stereotypes of an inferior social group. In

685   public carparks, for example, BEV drivers could be offered charging points in parking spaces

686   that were slightly larger than those for ICE cars, and distinguished by features such as

687   attractive paintwork and overhead cover in outdoor sites. Additional token indicators of

688   superiority could also be effective; as observed by a paper examining how airlines

689   constructed a sense of social prestige for high-class passengers, small items such as

690   personalised luggage labels or membership cards indicating access to a social group with a

691   desirable name (e.g., 'Club Premier' or 'Gold Circle') are able to generate a strong sense of

692   distinctive social identity (Thurlow & Jaworski, 2006). In the BEV context, these items might

693   take the form of public charging cards offering a range of 'perks', 'privileges', and 'rewards'

694   (Thurlow & Jaworski, 2006, p. 118), such as free hot beverages at participating service

695   stations and retail stores. These would not place ICE drivers at a disadvantage (as would

696   more radical strategies such as converting large areas of carparks to BEV-only parking

697   spaces), but could allow BEV drivers to view themselves as being in a position of luxury

698   while waiting for their vehicles to recharge, as opposed to a position of self-sacrificing

699   inconvenience.

700

701   **5. Conclusions**

702   This research drew on data collected as part of a much larger real-world project, and some

703   limitations should be taken into consideration. First, the interview schedules focused on

704   breadth rather than depth, and only a small proportion of questions specifically addressed

705   issues of image and identity. This was beneficial in some ways as the drivers revealed the

706   importance of undesirable stereotypes on an inductive level, but it also meant that drivers'

707   thoughts and feelings may not have been fully captured. It would be helpful, for example, to

708   consistently ask drivers how prevalent they thought the stereotypes to be, and how closely

709   related they felt to the perceived stereotype holders (e.g., were they referring to a few

710   strangers in the street, or to most of their close friends and family?). This could affect their

711   perceptions of how entrenched the stereotypes were, and the ways in which they felt able to

712   respond.

713   Second, the nature of the TSB ULCVD programme made face-to-face interviews unviable

714   due to the large number of participants and multiple locations, but researchers of future

715   studies could interview BEV drivers in person to form a stronger relationship of trust, build

716   rapport, and establish the conversational mode that encourages deep and reflective responses

717   (Rubin & Rubin, 2012).

718   Third, this research offered insight into the views of a unique sample of BEV drivers, and

719   the results were not intended to be representative of the UK mainstream market. Further

720   research could determine the extent to which the findings may be generalised to mainstream

721   consumers. However, the drivers could be considered 'early adopters' in a broad sense (as

722   observed by Skippon et al., 2016, the term 'early adopters' in EV research tends to be used

723   less precisely than by Rogers, 2003). It is important to assess the perspectives of this

724   consumer segment, which can powerfully influence the opinions of mainstream consumers

725   and help to swing the market one way or the other (Rogers, 2003). The fact that the majority

726   of drivers were male, white, and in their mid-40s was interesting in its own right, and future

727   studies could examine why so many early BEV adopters shared these demographic profiles,

728   and whether factors such as gender, ethnicity, and age influence drivers' attitudes and

729   behaviours towards stereotype threat.

730   Fourth, it must be taken into account that the findings are culturally and temporally

731   situated. Different stereotypes may exist in different global cultures, and stereotypes may

732   shift over time as BEV uptake increases. This shift could be positive, insofar as

733   environmentalist and technophile stereotypes might disappear as BEVs become normalised,

734   but it could also be negative if new stereotypes emerge (e.g., 'space hoggers' or 'pavement

735   blockers'; see Laker, 2018, for details of the controversy over how charging points are

736   obstructing pedestrians in some areas of London). It is also important to note that the findings

737   were to some extent unique to the time period of the trial, when BEVs were in their earlier

738   stages of development and differed in some ways (e.g., size and maximum speed) to the wide

739   range of models currently available in the UK. Nevertheless, the main practical barriers of

740   high upfront purchase costs, limited driving range, and insufficient public charging

741   infrastructure still exist, and given that 99.43% of non-commercial cars registered in the UK

742   in the first 6 months of 2018 were *not* BEVs (SMMT, 2018b), it is clear that the market still

743   has a long way to go.

744   To conclude, this study offered new insight into BEV drivers' experiences at a time when

745   BEVs face a critical turning point for mainstream adoption. By addressing the phenomenon

746   of stereotype threat outside the laboratory, it also advanced the scope of research in this

747   particular domain of social psychology, both in terms of the nature of the social context and

748   the nature of the identity under 'threat'. Ongoing investigation could help to shape innovative

749   ways of addressing psychological barriers and facilitators for uptake of novel products in a

750   world increasingly committed to tackling pollution and climate change.

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