

1 **Visitor perceptions of captive, endangered Barbary macaques (*Macaca sylvanus*)**
2 **used as photo props in Jemaa El Fna Square, Marrakech, Morocco.**

3

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15 **Abstract**

16 Visitors to Jemaa El Fna Square can pay to have their photograph taken with Barbary
17 macaques. Our aim was to characterise visitors' perceptions of such photo props,
18 enabling demand-reducing interventions to be targeted appropriately and destination
19 managers to maintain or enhance the visitor experience. Visitors to Jemaa El Fna
20 (n=513) were surveyed using a 25-item questionnaire including closed and open
21 questions.

22 Most visitors (88%) neither intended to use macaque photo props nor did; 7% *either*
23 intended to *or* did use photo props; while 5% both used photo props and had intended
24 to do so. Moroccans were more likely than foreigners to use macaque photo props or

25 intend to do so. Among international visitors, those who had their photo taken or
26 intended to were younger, with a lower level of education and lower income than
27 those who neither had their photo taken nor intended to. Visitors who did not use
28 photo props pitied the animals' treatment, disapproved of captivity or exploitation,
29 had concerns over hygiene or safety and disliked trader harassment. Visitors who did
30 use photo props valued novelty and contact with the animal; although half of them
31 also described negative experiences including trader harassment and animal
32 mistreatment. While 16% felt the presence of macaques makes Marrakech lively and
33 interesting; 40% recognised risks to health and safety and 57% thought Marrakech
34 would be a better place without macaque photo props. Although 66% agreed the
35 practice should be illegal, 80% were unaware that it is illegal. Only 25% correctly
36 identified the Barbary macaque as endangered.

37 Macaque photo props undermine current conservation objectives and legislation,
38 contribute to Disneyfication of macaques and may threaten the image of the
39 destination; however, their appeal to a minority of visitors indicates a desire to
40 interact with animals, which visitor education might divert towards more responsible
41 tourism.

42 **Keywords:** attitude; primate; tourism; visitor experience; wildlife trade

43 **Introduction**

44 The Barbary macaque (*Macaca sylvanus*, L.) is the only primate species endemic to
45 Morocco and Algeria and the only native primate in Europe (Butynski et al., 2008).
46 Morocco holds the largest wild population: an estimated 5,000 animals with the
47 largest stronghold in Ifrane National Park (Camperio Ciani et al., 2005; van Lavieren,
48 2004) but this has declined by >50% over the last 24 years due to destruction and
49 degradation of habitats (Butynski et al., 2008; Fa, 1984; Ménard & Vallet, 1993;
50 Taub, 1977) and illegal trade in juvenile macaques (Butynski et al., 2008; van
51 Lavieren, 2004; 2008). It is estimated that up to 300 infants are taken annually from
52 Morocco (van Lavieren, 2004), exceeding sustainable offtake by up to 50% per year
53 (Butynski et al., 2008; van Lavieren, 2004).

54

55 The Barbary macaque is categorised as endangered in the International Union for
56 Conservation of Nature (IUCN) Red list of threatened species (Butynski et al., 2008).
57 International trade is permitted only in exceptional cases and for non-commercial
58 purposes (CITES, 2016). In 2016, Barbary macaques were upgraded from Appendix
59 II to Appendix I of the Convention on International Trade in Endangered Species
60 (CITES) in recognition of the increasing threat of extinction and enabling stiffer
61 penalties (CITES, 2016). Moroccan Act No 29-05 prohibits the acquisition, holding,
62 display for commercial purposes or use for profit of CITES-listed species without a
63 license.

64

65 Despite the restriction, Barbary macaques are used as photo props for tourists –
66 principally in Marrakech (van Lavieren, 2004) although the trade has spread to

67 Meknes and other Moroccan cities more recently (personal observation, 2017). The
68 term ‘photo prop’ describes the use of animals in the manner of theatrical props; often
69 presented as an opportunity for tourists to interact with the exotic wildlife of the host
70 country (Osterberg & Nekaris, 2015). The practise is opportunistic in that it usually
71 takes place in popular tourist destinations, relying on passing trade, and profitable
72 both by selling photos and as a gateway to sell the animals themselves - this has been
73 reported for slow lorises (*Nycticebus* species, Osterberg & Nekaris, 2015) and white-
74 handed gibbons (*Hylobates lar*, Gray, 2012) in Thailand as well as macaques in
75 Morocco (van Lavieren, 2004). Unwanted or seized macaques – whose owners often
76 reported buying the animal in a Moroccan market – are found in rescue centres in
77 France, Belgium, The Netherlands, Germany, Spain and Italy (van Lavieren, 2004;
78 2008) despite their import being prohibited by EU Wildlife Trade Regulations
79 including Council Regulation (EC) No 338/97 (1996).

80

81 Tourism is an important sector of the economy for Morocco and the government aims
82 to increase tourist arrivals from 4.3 million in 2000 and 9.28 million in 2010 to 20
83 million in 2020 (Dobruszkes & Mondou, 2013; UNWTO, 2014). Marrakech contains
84 33% of the country’s tourist accommodation capacity (Ministère du Tourisme du
85 Maroc, 2015) and is one of the principal destinations for international visitors
86 (Dobruszkes & Mondou, 2013). Jemaa El Fna Square in the centre of the medina (old,
87 walled town) in Marrakech is world-renowned, principally for its performing street
88 artistes (Schmitt, 2005) and was in 2001 proclaimed a Masterpiece of the Oral and
89 Intangible Cultural Heritage of Humanity by UNESCO.

90

91 Jemaa El Fna Square is one of the principal sites for trade in Barbary macaques (van
92 Lavieren, 2004). Based on daily, informal observations over ten days, an infant
93 macaque might act as a photo prop 18 times per hour (personal observation, March
94 2013). Some tourists are charged as much as 100 Dirhams for a photo, although there
95 are many Moroccan tourists who pay much less. Assuming an average price of 10
96 Dirhams and 8-hour working days, the above-mentioned infant could earn the handler
97 the equivalent of the average monthly Moroccan household income (which was MAD
98 5,300 in 2009 [CMC, 2009]) in 3-4 working days; however, this estimate is highly
99 variable due to the effects of the tourist season, weather and the number of macaques
100 being used at one time.

101

102 Non-human primates have a history of popularity in entertainment and photo
103 opportunities (Agoramoorthy & Hsu, 2005; Wich & Marshall, 2016). Increasingly,
104 the photo prop trade is recognised as a threat to primate conservation (Caine,
105 Visalberghi, Schapiro & Leighty, 2011). Osterberg and Nekaris (2015) surveyed the
106 number of slow lorises (*Nycticebus* species) offered as photo props in a Thai resort
107 over a six-month period and used existing reports and confiscations to further quantify
108 the trade. Between 2008 and 2013 there were 1374 reports of wildlife – the majority
109 primates - being used for tourist entertainment, and an average of nine lorises
110 available at any one time.

111

112 Incidental observation of the capture in India of slender loris (*Loris lydekkerianus*) for
113 photography enthusiasts led Kanagavel, Sinclair, Sekar and Raghavan (2013) to
114 search a prominent wildlife photography website for instances of slow loris capture.

115 They found 29 captures in the period 1995-2011, in 16 of which they evaluated the
116 handling of the animal as unethical.

117

118 Nekaris, Campbell, Coggins, Rode & Nijman (2013) responded to the popularity of a
119 YouTube video, “tickling slow loris”, by analysing comments of 11,200
120 commentators from 172 countries (principally North America, Europe, Australia and
121 New Zealand). The most frequent categories of comment mentioned the cuteness of
122 the animal or wanting one as a pet. Over time, after the publication of a Wikipedia
123 page and television documentary, comments mentioning welfare issues and the
124 illegality of trade in lorises became more prevalent.

125

126 The public are increasingly cognizant of a moral obligation to minimise the suffering
127 of animals (Agoramoorthy & Hsu, 2005; Hughes, 2001; Kirkwood, 2003) and moral
128 or legal objections to the use of animals in tourist entertainment in Singapore
129 (Agoramoorthy & Hsu, 2005), USA and UK (Hughes, 2001) are documented.
130 Disapprobation of poor animal welfare may negatively affect the visitor experience
131 (Ruiz-Izaguirre & Eilers, 2012), where visitor experience is defined as the visitor’s
132 “immediate or ongoing, subjective and personal response to an activity, setting or
133 event” (Packer & Ballantyne, 2016) and includes the total process of anticipating,
134 making and remembering a visit.

135

136 To our knowledge, the present study is the first to evaluate visitor perception of
137 primate photo props in the streets or markets where they are offered.

138

139 The aim of this study was to characterise visitors' perceptions of macaque photo props
140 in Jemaa El Fna in order to: (a) enable information campaigns about welfare,
141 conservation and health/safety issues to be targeted; and (b) provide destination
142 managers with the information to respond appropriately to any negative impacts of the
143 photo prop trade on visitor experience.

144

145 **Methods**

146 Ethical approval was granted by Edinburgh Napier University Faculty of Health, Life
147 and Social Sciences Research Ethics Committee and a research permit obtained from
148 the Scientific Institute of Rabat. Jemaa El Fna Square was selected as the study site
149 because of the high concentrations of visitors and captive macaques (van Lavieren,
150 2004).

151

152 Respondents were legal adults and gave their informed consent to participate. Visitors
153 were asked their reasons for visiting Morocco, Marrakech and Jemaa El Fna, their
154 country of residence and the length of stay in Morocco; whether they had seen the
155 macaques, had their photo taken with a macaque or intended to. This was followed by
156 open-ended questions about what they enjoyed and did not enjoy about having their
157 photo taken with a macaque or, if they did not have their photo taken, why they did
158 not. There followed questions about whether it is legal in Morocco to offer to take
159 someone's photograph with a Barbary macaque and whether the species is
160 endangered. Statements about approval for the practice of using animals as photo
161 props, whether the practice should be illegal, whether animals in the market are an

162 attraction, and whether macaques may be harmful to the health and safety of tourists
163 were then presented with 5-point Likert-format responses (Likert, 1932).
164 Demographic questions (gender, age group (10-year bands), highest level of education
165 completed and income relative to perceived average income in their home country
166 (lower third/middle third/higher third)) were presented last. The questionnaire was
167 piloted on a sample of ten before translation and data collection: no alterations were
168 made.

169

170 Questionnaires and consent forms were translated into French, Dutch, German,
171 Spanish and Arabic and administered by the first author and research assistants (17
172 Moroccans and 3 Europeans) each of whom was fluent in one or more of these
173 languages and in English. Researcher-administered questionnaires were used to
174 maximise return of completed forms and so that comprehension of the questions could
175 be assisted if necessary. Research assistants were briefed each morning by the first
176 author to ensure uniformity. Scenarios in which mock respondents expressed strong
177 views and interviewers maintained a neutral tone were rehearsed.

178

179 The survey took place between 10am and 5pm over eight days between 28th March
180 and 8th April 2013 during an Easter holiday when tourism was at a peak. Visitors to
181 the square were approached on a next-to-pass basis (Veal, 2006) at the main exit
182 points to the market to achieve high encounter rates of visitors who had seen
183 macaques. The survey was introduced to visitors as concerning wildlife tourism in
184 Jemaa El Fna Square. Respondents were allowed to omit any question they did not
185 wish to answer and responses were anonymous to encourage respondents to express

186 honest views (Cargan, 2007). The number who declined to participate was not
187 recorded. Each questionnaire took approximately five minutes.

188

189 *Data analysis*

190 Intention and behaviour of visitors relation to macaque photo props were categorised
191 as “hot”, “warm” or “cold” in, using the following definitions adapted from Fredline
192 and Faulkner’s (2001) study of Australia’s wildlife tourism:

193 “hot” = intended to have their picture taken with a macaque *before* coming to the
194 square and did have their picture taken with a macaque.

195 “warm” = *either* intended to have their picture taken with a macaque but did not; *or*
196 did have their picture taken with a macaque without prior intention to do so.

197 “cold” = neither intended to have their picture taken with a macaque, nor did so.

198

199 Responses to open-ended questions were subjected to thematic analysis as described
200 in Braun and Clarke (2006), adopting a realist perspective in which the aim was to
201 report the experiences, meanings and reality of participants rather than to explain the
202 social discourses giving rise to the construction of those meanings. Once familiar with
203 the data, we generated codes inductively in response to the data rather than pre-
204 determining codes from literature. Codes were then criticised, refined, grouped into
205 themes and the themes criticised and refined. The responses assigned to each code
206 were then quantified.

207

208 Quantitative data were analysed in SPSS® version 20 (IBM, 2011), using non-
209 parametric statistics because data were recorded using ordinal or categorical response
210 formats.

211

212 **Results**

213 *Survey respondents*

214 Of the total 513 respondents to the survey, 271 (53%) were female, 220 (43%) were
215 male and gender was unrecorded for 22 (4%). Median age fell into the 31-40 years
216 category and age ranged from 18 to >80 years.

217

218 The majority (400, 78%) were from Europe, with the next largest proportion (n=64,
219 13%) from Africa. There were 38 different nationalities but the most frequent country
220 of origin was France (n=112, 22%), followed by United Kingdom (n=71, 14%),
221 Germany (n=60, 12%), Morocco (n=51, 10%), Netherlands (n=42, 8%) and Belgium
222 (n=29, 6%).

223

224 *Are captive Barbary macaques a visitor attraction to Jemaa El Fna Square?*

225 Photo opportunities with Barbary macaques were an attraction prior to visiting Jemaa
226 El Fna Square for only 39 visitors (8%). The majority of those who answered this
227 question (462, 92%) did not intend to have their photograph taken with a macaque
228 prior to visiting the square. Five percent of visitors (n=26) were categorised as “hot”,
229 7% (n=36) as “warm” and 88% (n=450) as “cold” (one did not answer this question).

230

231 The relation between nationality (Moroccan or other) and attractiveness of macaques
232 as photo props (with the categories “hot” and “warm” combined to avoid low
233 expected frequencies) was significant (Chi squared test of independence: X^2 (df = 1, N
234 = 512) = 47.65, $p < 0.001$), with macaques proving to be a greater attraction for
235 Moroccans than other nationalities. Among Moroccan visitors, 21 (41%) fell into the
236 “hot” or “warm” category and 30 (59%) into the “cold” category, while of non-
237 Moroccans 420 (92%) were in the “cold” category and 41 (8%) in the “hot” or
238 “warm” categories.

239

240 The proportions of each nationality falling into the “hot”, “warm” and “cold”
241 categories are displayed in Figure 1 for countries with the largest numbers of
242 respondents.

243

244 [Figure 1 near here]

245

246 International visitors categorised as “hot” or “warm” in relation to macaque photo
247 opportunities were younger (Mann-Whitney test, $U=4515$; hot/warm $n=37$, mean rank
248 141; cold $n=401$, mean rank 227; $p < 0.001$), their highest educational qualification was
249 lower (Mann-Whitney test, $U=4782$; hot/warm $n=37$, mean rank 148; cold $n=387$,
250 mean rank 219; $p < 0.001$) and their self-reported income relative to the perceived
251 average income in their home country was lower (Mann-Whitney test, $U=4057$;
252 hot/warm $n=29$, mean rank 155; cold $n=342$, mean rank 189; $p=0.042$) than
253 international visitors in the “cold” category. Of international visitors categorised as
254 “hot” or “warm” ($n=41$), 23 also made negative comments about the experience.

255

256 The presence of macaques might be considered an attraction even for visitors who did
257 not wish to have their photo taken, as part of the atmosphere and cultural heritage of
258 the square. Therefore, we asked respondents to list their reasons for visiting Jemaa El
259 Fna. Twelve percent (n=63) listed animal entertainment among their reasons for
260 visiting the square (Figure 2) but for only one was entertainment with animals the sole
261 reason cited.

262

263 [Figure 2 near here]

264

265 *Visitor experience and attitudes towards macaques in the square*

266

267 Visitors who had intended to have their picture taken but changed their minds cited
268 reasons including trader harassment, hygiene concerns, mistreatment of macaques and
269 not yet having had the opportunity. The most frequently cited reason for not having a
270 photograph taken with a macaque was concern for the animals' welfare (n=100, 22%
271 of responses) (Table 1). Finding the practice unacceptable was the most prevalent
272 theme (204 comments) but visitors were also concerned for their own wellbeing (57
273 comments). No-one specifically mentioned illegality of the practice, even those who
274 expressed disapproval.

275

276 [Table 1 near here]

277

278 Those visitors who did have their photograph taken with a macaque were asked what
279 they enjoyed and did not enjoy. The experience of the interaction was more important
280 than getting the photograph for the majority of visitors (Table 2) although some felt

281 pressured into it by the macaque handlers, did not enjoy the experience and made no
282 positive comment (Table 3).

283

284 [Table 2 near here]

285 [Table 3 near here]

286

287 Level of agreement with the statements displayed in Figure 3 indicate that the
288 majority of visitors are not positively disposed towards the presence of captive
289 macaques in the square.

290

291 [Figure 3 near here]

292

293 Although 326 (66% who answered this question) agreed or strongly agreed that it
294 should be illegal to keep macaques for photo opportunities, in answer to the question;
295 “is it legal in Morocco to offer to take someone’s photograph with a Barbary
296 macaque?” 102 (20%) answered “no, it is not legal”, 122 (24%) think it is legal, 276
297 (54%) answered “don’t know” and 13 (2%) did not answer. Asked; “are Barbary
298 macaques an endangered species?” 315 (61%) answered no, 130 (25%) answered yes
299 and 68 (13%) did not know or did not answer.

300

301 **Discussion**

302 *Are macaques a tourist attraction or a detraction?*

303 The great majority of visitors did not intend to have their photograph taken with a
304 macaque when planning to visit the square and a large majority also omitted to

305 mention animal entertainment when listing their reasons for visiting Jemaa El Fna.
306 While some consider that the presence of macaques makes Marrakech a more lively
307 and interesting place; a majority think that Marrakech would be a better place if the
308 use of macaques in photo opportunities was banned and that it should be illegal. Two
309 fifths of visitors recognise it as harmful to the health and safety of tourists.

310

311 Our results show that the present situation is likely to detract from the experience of
312 Jemaa El Fna Square for many visitors. This is reflected in the attitudes of visitors
313 towards macaques in the square (Figure 3) and in the verbatim responses from visitors
314 who did not want to have their photo taken with a macaque or did not enjoy the
315 experience (Tables 1 and 3). The largest theme among positive responses was about
316 novelty, indicating that other unusual performances or souvenirs could replace
317 macaque photo props in these visitors' experiences of Jemaa El Fna Square.

318

319 The photo prop trade could be stopped without fear of impacting the international
320 tourism market. Moroccan nationals are more interested but the existence of this
321 market cannot be said to represent any benefit for Morocco: revenues gained by
322 unlicensed macaque-handlers are likely to be untaxed and are more than offset by the
323 ecological losses associated with macaque poaching (Butynski et al., 2008).

324

325 ***Poor animal welfare adversely affects visitor experiences***

326 Studies consistently report that perception of poor animal welfare contributes to a
327 negative experience or image of the destination for visitors (Godinez, Fernandez &

328 Morrisey, 2013; Lee, 2015; Miller, 2012; Nimon, 1990, cited in Tribe 2001;
329 Plumridge & Fielding, 2003; Ruiz-Izaguirre & Eilers, 2012; Wolf & Tymitz, 1981,
330 cited in Tribe, 2001). Visitors who did and who did not have their photo taken with a
331 macaque expressed a negative perception of the animals' welfare. Much of the
332 literature relates to zoo and aquarium visitors who have chosen to view captive
333 animals, as distinct from the respondents in our study who may have had no such
334 intention. As such, the proportion of visitors who feel antipathy to captivity on
335 philosophical grounds may be greater in the present study than in other situations.

336

337 Woods (2002) found that the most frequently-mentioned feature (48%) of worst
338 experiences with captive animals was poor husbandry; including confinement,
339 dissimilarity of the captive environment with a natural one, interpreted distress of the
340 animal or perceived unhygienic conditions. Poor service for visitors was the next most
341 frequently mentioned, followed by aggression by the animal (19% and 12% of worst
342 experiences, respectively). Respondents in our study reported similar themes, with
343 pity for the animals' welfare and dislike of trader harassment being mentioned both by
344 those who did and by those who did not have their photograph taken, although fear
345 was mentioned only by those who chose not to avail of photo opportunities. Since the
346 experiences described by visitors to Jemaa El Fna share common themes with the
347 worst experiences with captive wildlife that respondents in Woods' (2002) study
348 could recall in their lifetimes, captive macaques may have substantial negative impact
349 on the visitor experience of Marrakech.

350

351 For six of the 49 visitors who described what they enjoyed about having their
352 photograph taken with a macaque, contact with the animal was the most enjoyable
353 thing; indicating that there is, as reported in other studies (Plumridge & Fielding,
354 2003; Ruiz-Izaguirre & Eilers, 2010) desire on the part of some visitors to interact
355 with animals. In the main, we did not find the enjoyable interactions that Woods
356 (2002) reported: 53% of visitors who had their photo taken with a macaque found
357 something unpleasant about the experience. Woods's respondents most often
358 described non-contact interactions with animals as the enjoyable aspect of experiences
359 with captive wildlife, followed by opportunities for learning about the animal.

360

361 *Moroccan wildlife tourism without macaque photo props*

362 Hughes (2001) uses a case study from the UK to describe how the performance of
363 captive animals for entertainment came to be considered “morally unacceptable, such
364 that the tourism and entertainment industries can no longer incorporate it into its
365 provision” and calls this; “an early sign for the tourism industry of the power of the
366 animal rights and welfare lobby” - as a result of which large UK attractions displaying
367 performing dolphins closed while small businesses offering dolphin-watching tours
368 flourished.

369

370 There is opportunity for ecotourism enterprises, if appropriately managed, to provide
371 a better experience for tourists who value animal encounters while also being less
372 damaging to wild macaque populations. The nature-based and ecotourism sector is
373 one of the fastest-growing in the international tourism market (Tisdell, 2003), attracts
374 tourists who stay longer (Menezes, Moniz & Viera, 2008) and spend more (Weaver,

375 2001) than the average international visitor and are more likely to travel beyond
376 international gateways (Fredline & Faulkner, 2001). Wildlife in non-captive settings
377 are more likely to attract international visitors and provide a more intense, emotional,
378 exciting and engaging experience than most captive wildlife settings (Packer &
379 Ballantyne, 2012).

380

381 Although Morocco aims to expand and diversify tourism, the distribution has
382 remained rather constant, with 71% of nights in commercial accommodation spent in
383 Marrakech, Agadir and Casablanca and little international tourism outside the main
384 historical capitals (Dobruszkes & Mondou, 2013). If an ethically driven structural
385 shift similar to that described for the UK by Hughes (2001) were to occur in Morocco,
386 the development of local entrepreneurs at the expense of illegal sole traders and some
387 shift in visitation from the historical capitals to rural areas could be considered highly
388 beneficial for the economic sustainability of Moroccan tourism.

389

390 Not all non-captive wildlife tourism is sustainable; however, since visitors may induce
391 stress in animals, disrupt feeding patterns through deliberate or unintentional feeding,
392 otherwise influence animal behaviour or damage habitats (Borg, Majolo, Qarro &
393 Semple, 2014; El Alami, van Lavieren, Rachida & Chait, 2012; Majolo, McFarland,
394 Young & Qarro, 2013; Maréchal et al., 2011; Packer & Ballantyne, 2012).

395

396 *Macaques in culture*

397 Although Moroccans were more likely to have their photo taken (or to want to), the
398 full spectrum of attitudes towards macaque photo props was manifest among
399 Moroccan visitors: objections to captivity and poor welfare, safety and hygiene
400 concerns, dislike of harassment as well as delight in the unusual. Greater interest from
401 Moroccans may or may not reflect cultural differences in attitudes towards animals.
402 Six (12%) respondents identifying as Moroccan were visiting the country, five of
403 whom had their photo taken with a macaque or intended to. We might speculate that
404 photos of Moroccan sights and fauna serve to strengthen the Moroccan identity of
405 expatriates; however, explaining the reasons for differing interest between groups was
406 beyond the scope of this study.

407

408 Activities primarily targeted towards international visitors may represent global
409 influences threatening authenticity because the original cultural heritage leading to the
410 designation of World Heritage Site is about meeting the needs of the community for
411 cultural expression (UNESCO, 2015). Schmitt (2005) regards those actors or elements
412 of performance which “serve above all as decorative models for photographs” as a
413 Disneyfication of the intangible cultural heritage of Jemaa El Fna Square; meaning
414 that which is an “inauthentic, commodified and banalized modernisation or
415 reproduction of cultural forms removed from their original context”.

416

417 It could be argued that altering the activities of the square to reflect an animal welfare
418 ethic held most strongly by Western Europeans favours the values of visitors over
419 those of hosts and opens the authors to accusations of neo-colonialism. In the case of
420 animals used as photo props it can be countered that the practice itself is a symptom

421 of the influence of a Western culture of commodification and over-consumption – the
422 denial of wildness in animals; the removal of animals from their Moroccan habitat
423 context for commutation into easily-consumable photographic souvenirs. This
424 distancing from the natural world and representation of macaques as ‘cute’ are
425 consistent with the phenomenon of Disneyfication (*sensu* Baker, 1993 and Inkson &
426 Minnaert, 2012, p.236) and consistent with the lack of recognition of risks posed by
427 macaques (discussed below).

428

429 Baker (1993) contends that until animals are disentangled from their Disneyfied
430 representations the animals’ predicaments cannot be clearly seen, consistent with the
431 finding that only 25% of our sample correctly identified Barbary macaques as an
432 endangered species. Ross et al. (2008) described this phenomenon for chimpanzees:
433 95% of zoo visitors surveyed identified gorillas as endangered, 92% identified orang-
434 utans as endangered but only 69% correctly assigned this status to chimpanzees.
435 When asked to explain, 35% of people gave the reason that chimps are commonly
436 seen in the media and can be privately owned, therefore the species must not be in
437 jeopardy.

438

439 ***Macaques can be harmful to the health and safety of tourists and handlers***

440 Sixty percent of visitors disagreed or were unsure that macaques could be harmful to
441 the health and safety of tourists, yet physiological similarities among all primates
442 mean that close contact with non-human primates is considered a high-risk source of
443 emerging infectious agents with the capacity to transfer between humans. Foreign
444 tourists are a potential vehicle for global transmission of an emerging infectious agent.

445

446 Macaques can carry herpes B virus (*Herpesvirus simiae* - often asymptomatic in
447 macaques but potentially severe in humans (Huff & Barry, 2003)), simian virus 40,
448 simian foamy virus and simian type D retrovirus, all of which can be transmitted to
449 humans (Conly & Johnston, 2008). Returning French travellers presenting for rabies
450 treatment had in 20% of cases acquired the infection from non-human primates
451 including Barbary macaques in North Africa (Gautret et al., 2010). Monkeys account
452 for 21% of animal-associated injuries to tourists and the majority of injuries to female
453 travellers (Gautret et al., 2007), illustrating the potential for disease transmission due
454 to bites. Lice (*Pedicinus albidus*) also provide a vector (Cohn et al., 2007). The Centre
455 for Disease Control and Prevention (2017) advises that travellers should never touch
456 or feed monkeys.

457

458 There are few data on how zoonotic disease affects tourism demand (Donohoe,
459 Pennington-Gray and Omodior, 2015) but if cases are publicised it is reasonable to
460 expect a substantial impact on the image of the destination. Destination management
461 plans should address prevention of disease threats as part of crisis management
462 strategies (Pennington-Gray et al., 2009). Educational intervention (modifying the
463 behaviour of visitors to reduce risk of exposure) is a key component of such
464 prevention (Donohoe, Pennington-Gray and Omodior, 2015).

465

466 *Visitor education*

467 Understanding differences in visitor behaviour between market segments can be used
468 to target informative strategies to specific groups (Brown 1999; Brown, Ham &

469 Hughes, 2010; Kim & Weiler, 2012). Information campaigns (e.g. distributed by tour
470 operators and in hotels) should particularly target Moroccans, European Moroccans
471 and arrivals from France and Spain, although provision of material in German and
472 English is also important.

473

474 Psychosocial determinants of behaviour are: awareness of the problem; attribution of
475 some responsibility to oneself; feelings of guilt; and perception of the social norms
476 surrounding the issue. These contribute to the formation of attitudes about the
477 situation/behaviour; development of a moral norm about what one should do; and a
478 perception of the control one has over the issue through one's own behaviour,
479 together creating the intention to behave in a particular way (Bamberg & Moser,
480 2007). Ethically-motivated behaviour should occur when individuals are aware of
481 adverse consequences for other beings and aware of how they personally could avert
482 those consequences – particularly if the behaviour is easy to carry out (Schwartz,
483 1973 & 1977, cited in Bamberg & Moser, 2007).

484

485 Here, awareness of the conservation problem is lacking (75% fail to recognise
486 macaques as endangered); a welfare problem was mentioned by only 22% of visitors
487 and health risks by 40% so there is scope to improve problem-awareness. Of those
488 who did have their photo taken with a macaque, 12% most enjoyed contact with the
489 animal suggesting that this group also feel affinity for macaques and might therefore
490 readily change their behaviour if they became aware of negative consequences for the
491 animals.

492

493 Laws reflect and express social norms and most visitors (80%) are unaware of the law
494 so here, too, simple informative campaigns could influence a key behavioural
495 determinant. A proportion of visitors already take the view that macaque photo props
496 are unacceptable and reference moral norms such as “animals should not be beaten or
497 chained” and “wild animals should be in the wild”. One’s social networks and role
498 models influence perception of social norms, making social networking sites a useful
499 target for campaigning organisations. Images of celebrities posing with animal photo
500 props are potentially very damaging but also present an opportunity for campaigning
501 organisations to mobilise the sector of society who find this unacceptable to express
502 their view in social media (e.g. Wild Futures, 2015).

503

504 In respect of the macaque handlers, the determinants of their behaviour are almost
505 entirely unknown. It is likely that contextual factors (ease of obtaining money and low
506 probability of prosecution), habitual behaviour and low perceived behavioural control
507 (few/no perceived alternative means of earning) are more important determinants of
508 behaviour in such a case than underlying values or attitudes (Steg & Vlek, 2009).

509 Studies have been conducted into the drivers of hunting for the bushmeat trade (e.g.
510 Lindsey et al., 2013; Nyaki, Gray, Lepczyk, Skibins & Rentsch, 2014) but not for the
511 photo prop trade. Law enforcement is important but also the availability of alternative
512 employment for macaque handlers.

513

514 **Conclusions and recommendations**

515 Macaques are an attraction for a minority of visitors but overall detract from the
516 visitor experience. This reflects a wider picture shown by previous research: animals

517 in tourism are a draw but this is easily outweighed by pity for the animals' plight and
518 disapproval of their conditions. Here, impacts on the visitor experience are
519 particularly negative for international visitors.

520

521 Educational interventions have strong potential to reduce demand for macaque photo
522 props. Such interventions should leverage moral norm activation, making visitors
523 aware of negative consequences for macaques.

524

525 Destination managers should support restrictions on holding macaques both to
526 improve the international visitor's experience and to reduce risks of disease with its
527 consequent impacts on destination image.

528

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542

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