

1 **Drivers of taxonomic bias in ecology and evolution: insights from ethologists and behavioural**  
2 **ecologists**

3 Pietro Pollo\*, Michael M. Kasumovic

4 Evolution & Ecology Research Centre, School of Biological, Earth & Environmental Sciences,  
5 University of New South Wales, Kensington, NSW, 2052, Australia

6 \* Corresponding author: [pietro\\_pollo@hotmail.com](mailto:pietro_pollo@hotmail.com)

7

8 **ORCID**

9 Pietro Pollo: <https://orcid.org/0000-0001-6555-5400>

10 Michael M. Kasumovic: <https://orcid.org/0000-0003-0158-5517>

11

12 **Abstract**

13 Taxonomic bias (i.e. the disproportionate attention given to some taxa relative to their diversity)  
14 remains a major barrier to achieving generality in ecology and evolution, yet its underlying causes  
15 are poorly understood. Here, we proposed a general framework to explain taxonomic bias along  
16 three major axes, supported by evidence from a survey of 868 researchers' taxonomic experiences.  
17 First, rational considerations, such as logistical ease and societal relevance, were associated with  
18 the choice of research organisms within major animal groups, but rarely across them. Second,  
19 emotional factors, including fondness for certain taxonomic groups and preferences for particular  
20 work environments, closely mirrored patterns of taxonomic bias observed in the literature. This  
21 suggests that taxonomic affinities and the environments in which organisms occur play a critical  
22 role in the choice of study systems. Third, contextual factors, like the prominence of certain  
23 organisms within peer networks or early-career exposure to specific taxa, were also associated  
24 with which taxa are chosen as study systems. Based on these findings, we suggest actions to  
25 mitigate taxonomic bias, including promoting (i) outreach initiatives featuring neglected taxa, (ii)  
26 taxonomically equitable education, and (iii) taxonomically diverse research experiences.

27

28 **Key-words:** charismatic species, knowledge imbalance, model organisms, research bias,  
29 taxonomic chauvinism.

30

## 31 **Introduction**

32 One of the main goals of ecology and evolution is to comprehend biological processes and patterns  
33 across Earth's vast diversity of life. This goal is hindered when certain taxa receive  
34 disproportionately more attention than their diversity warrants, a pattern known as taxonomic bias  
35 or taxonomic chauvinism<sup>1,2</sup>. Taxonomic bias leads to the accumulation of knowledge on few  
36 organisms at the cost of the perpetuation of ignorance on all others, ultimately precluding  
37 theoretical generality<sup>2,3</sup>. Unfortunately, taxonomic bias is widespread in ecology and evolution<sup>2,4-</sup>  
38 <sup>17</sup>. For instance, even though birds and mammals comprise less than 2% of animal biodiversity<sup>18</sup>,  
39 these animals dominate both conservation efforts<sup>13-15</sup> and scientific articles in most subpockets of  
40 ecology and evolution<sup>2,4-12</sup>. Taxonomic bias also extends to finer taxonomic scales, with a handful  
41 of genera or species concentrating much of the research attention given to entire clades<sup>16</sup>.  
42 Investigations of the literature on specific animal groups (e.g. amphibians<sup>19</sup>, birds<sup>20-22</sup>,  
43 mammals<sup>23,24</sup>, primates<sup>25,26</sup>; see also ref. <sup>27</sup>) have shown that organisms' traits (e.g. size and  
44 colour), range, and location can influence the amount of attention they receive, shedding some  
45 light on the drivers of taxonomic bias. However, such literature assessments present only indirect  
46 and taxon-specific evidence regarding the origins of taxonomic bias, highlighting the absence of a  
47 general framework spanning multiple taxonomic levels and empirical support for it. In other  
48 words, why ecologists and evolutionary biologists choose the organisms they study largely remains  
49 a conundrum. Understanding this question requires understanding the scientists that perform this  
50 research.

51 Scientists are often expected to be entirely rational in their research choices (Fig. 1) but, in  
52 reality, their emotions and context can play major roles in such decisions<sup>28</sup>. For instance,  
53 researchers may be drawn to particular organisms out of fondness for them<sup>29</sup>. Opinions about

54 organisms, such as vertebrate animals being more valuable than invertebrate ones<sup>30,31</sup>, often arise  
55 from societal perceptions that develop from a young age. For example, children asked to draw  
56 natural landscapes are much more likely to depict vertebrates, particularly mammals and birds,  
57 than invertebrates<sup>32,33</sup>. This skewed perception is then reinforced by the media (e.g.  
58 documentaries<sup>34</sup>) and educational materials (e.g. textbooks<sup>35</sup>), helping to cement the idea that  
59 certain organisms are more important or interesting than others well into adulthood. It is thus  
60 plausible that the image that biologists have of nature, which is subjected to cultural factors and  
61 constructed before even joining academia, can influence their research choices. In fact, feelings of  
62 admiration and fascination towards certain taxonomic groups potentially entice early-career  
63 biologists to work with these groups or may even encourage people to pursue a career in biology  
64 in the first place. By contrast, organisms that produce anxiety, fear, or disgust (i.e. biophobias<sup>36,37</sup>)  
65 may suffer from disinterest and avoidance from the general public and, consequently, have a lower  
66 research effort directed at them.

67         While some emotional links to taxa arise from society at large, others can be a product of  
68 habits and perceptions restricted to smaller social spheres. For instance, having hobbies that  
69 involve particular organisms (e.g. hunting or bird watching) may help construct positive feelings  
70 towards these organisms<sup>38</sup> and therefore skew research effort in their favour. Similarly, preferences  
71 for certain work-related aspects, such as a strong inclination toward fieldwork (a sentiment shared  
72 by many biologists and reflected in the popularity of field courses<sup>39</sup>), can influence researchers'  
73 taxonomic focus. This is because some organisms (e.g. many mammals and birds) can only be  
74 studied in the field, potentially attracting scientists that enjoy spending their time outdoors.  
75 Furthermore, although researchers may have predilections for certain organisms, their choice of  
76 study species can also be driven by other personal motivations. For example, researchers may be

77 primarily motivated to investigate a particular topic (e.g. sexual selection), making the selection  
78 of a particular study organism less important to them. Understanding researchers' preferences and  
79 motivations then becomes pivotal to grasp drivers of taxonomic bias.

80 Science is built on prior research, so the popularity of an organism in an academic context  
81 may reinforce and amplify its own popularity, generating a feedback loop. This process partly  
82 stems from pragmatism: as more resources become available for an organism, further research on  
83 it becomes easier. However, there is also a subjective element to this process, as scientists may  
84 come to view certain organisms as "ideal" study systems because of their established reputation  
85 rather than their intrinsic characteristics. This is essentially how so-called model organisms  
86 arise<sup>40,41</sup>. While the intense use of such organisms have allowed important insights into biological  
87 mechanisms<sup>42</sup>, ecologists and evolutionary biologists not necessarily interested in mechanistic  
88 questions have also frequently used model organisms in their research, leading to an unnecessary  
89 accumulation of knowledge on a few species<sup>16</sup>. Moreover, scientists' individual context may also  
90 influence the choice of research organisms. Researchers who continue working with the same taxa  
91 (often introduced by their supervisors early in their careers) enjoy a logistical advantage over those  
92 who attempt to study unfamiliar taxa. At the same time, fear of failure may also play a role in  
93 maintaining this focus, particularly as careers progress and the practical advantage of studying a  
94 familiar taxon over a new one diminishes. Ultimately, this form of taxonomic inheritance can  
95 perpetuate or even exacerbate existing taxonomic biases.

96 Here, we explored potential overarching drivers of taxonomic bias in ecology and evolution  
97 by directly surveying researchers (specifically ethologists and behavioural ecologists) about their  
98 experiences, preferences, and perceptions regarding different taxa. We hypothesise that multiple  
99 rational, contextual, and emotional factors are associated with the selection of research organisms

100 (Fig. 1), leading to a variety of predictions (Table S1; pre-registered<sup>43</sup>). Based on our findings, we  
101 then suggest interventions to reduce taxonomic bias in the field of ecology and evolution.

102

## 103 **Results**

### 104 *Participant profile*

105 Participants in our survey ( $N = 868$ ) were, on average,  $42.89 \pm 11.56$  years old (mean  $\pm$  SD).  
106 52.76% of them identified as men, 44.82% as women, 1.73% as another gender identity (e.g.  
107 gender-fluid, non-binary), and 0.69% did not disclose their gender identity. We asked each  
108 participant to name the country where they spent most of their life before and after reaching  
109 adulthood (18 years old), to which we obtained 68 unique countries before age 18 and 59 after age  
110 18 (Fig. S1), with 80.65% of participants selecting the same country for both periods. Most  
111 participants (89.97%) held a PhD degree and more than a third of all participants (36.52%) had  
112 editorial experience (see question 8 in Appendix 1).

113

### 114 *Preferences and overall experience collecting behavioural data*

115 On a scale from 0% to 100%, we asked participants to determine how they would split their time  
116 collecting behavioural data between the field and the lab based purely on personal enjoyment  
117 (hereby *preference for fieldwork*; question 9 in Appendix 1), and how much their desire to work  
118 with certain taxa drove their behavioural research interests compared with other motivations  
119 (hereby *motivation from taxa*; question 10 in Appendix 1). On average, preference for fieldwork  
120 was  $59.27\% \pm 1.02\%$  and motivation from taxa was  $50.76\% \pm 0.96\%$ , but responses to these  
121 questions varied across participants (Fig. S2A, B).

122 Participants experienced (i.e. directly collected behavioural data that led to at least one  
123 research output in which they were an author; question 13 in Appendix 1), on average,  $9.48 \pm 0.45$   
124 species (Fig. S2C). However, this estimate would be higher if we had not (unintentionally) set a  
125 maximum of 80 in the survey platform for this question (16 participants answered this maximum  
126 number; Fig. S2C). From the 11 taxonomic groups listed in our survey as options (amphibians,  
127 arachnids, birds, crustaceans, fish, insects, mammals, molluscs, other invertebrates, other  
128 organisms, and reptiles), participants experienced, on average,  $2.1 \pm 0.04$  of them (Fig. S2D).  
129 Participants that experienced more species, on average, also experienced more taxonomic groups  
130 (Fig. 2; Table S2). Age and motivation from taxa were associated with both the number of species  
131 and the number of taxonomic groups experienced, while gender and editorial experience were only  
132 related to the number of species (Fig. 2A, C; Table S2, S3). By contrast, field preference was  
133 unrelated to the number of species or taxonomic groups experienced (Fig. 2; Table S2, S3).

134

### 135 *Feelings towards animal groups*

136 We asked participants how they felt towards distinct taxonomic groups (“other invertebrates” and  
137 “other organisms” were not included in this question) on a spectrum ranging from negative (e.g.  
138 fear, anxiety) to positive (e.g. cuteness, fascination) feelings, with ambivalent feelings in between  
139 (question 11, see Appendix 1). All animal groups mostly elicited positive feelings from  
140 participants, although some more than others (Fig. S3). On average, participants declared more  
141 favourable perceptions of taxa they experienced than of other taxa ( $\beta = 2.52 \pm 0.07$ ,  $z = 33.91$ ,  $p <$   
142  $0.001$ ; Fig. 3A; Fig. S3B, C; Table S4). Multiple other factors were also associated with how  
143 participants felt about certain taxa (Fig. 3A; Table S4).

144

145 *Experiences with taxonomic groups*

146 Birds and mammals were the taxa that participants most frequently experienced (each by 42.58%  
147 of participants), followed by insects (35.21%) and fish (24.05%; Fig. S4). Unsurprisingly,  
148 participants that experienced more taxonomic groups were more likely to experience any given  
149 taxon (Fig. 3B; Table S5). We also found associations between experience with certain taxa and  
150 other factors, especially preference for fieldwork (Fig. 3B; Table S5).

151

152 *Experiences with specific species*

153 We asked participants to name the species they most and least recently experienced (question 14,  
154 Appendix 1), for which we obtained 839 and 741 valid responses, respectively. We then asked  
155 participants several questions related to the species they mentioned, beginning with when they first  
156 worked with these species (question 17, Appendix 1) and who advised them to do so (question 18,  
157 Appendix 1). Regardless if the species named was the most or least recently experienced by the  
158 participant, it was suggested by supervisors as a research system in most cases, except when  
159 participants already held a permanent position (Fig. 4; Table S6).

160 The taxonomic group of species mentioned by participants in our survey (Fig. S5A)  
161 followed a similar pattern to the one shown for participants' overall experience (Fig. S4). However,  
162 we noted that many researchers mentioned the same species and genera. For example, *Drosophila*  
163 *melanogaster*, *Rattus norvegicus*, and *Parus major* were mentioned by 22, 21, and 17 participants,  
164 respectively. In fact, only 65.29% and 49.68% of all responses (for organisms experienced by  
165 participants) represented unique species and genera, respectively. The most popular taxonomic  
166 groups, especially mammals, were the ones with the relatively fewest unique species (Fig. S5B)  
167 and genera (Fig. S5C).

168 We additionally asked participants to rate their agreement with 13 statements related to the  
169 organism they most recently experienced on a 7-point Likert scale (from “completely disagree” to  
170 “completely agree”; two particular statements were also rated for the organism least recently  
171 experienced; questions 19-31, Appendix 1). The first five statements tackled the ease of accessing  
172 and working with the organisms mentioned, in which we found distinct average scores across  
173 taxonomic groups (Fig. 5). Furthermore, after controlling for the genus and the taxonomic group  
174 of the species mentioned by participants, a stronger preference for fieldwork was associated with  
175 perceiving the species experienced as easier to observe in the field (though not necessarily easier  
176 to find there), and harder to buy, rear, or observe in the laboratory (Table S7, S8). Lastly, within  
177 taxonomic groups, the number of times a genus was mentioned by distinct participants was  
178 positively related to all aspects aforementioned regarding how easy they are to work with (Table  
179 S7, S8).

180 No universal taxonomic patterns emerged from participants’ agreement with other  
181 statements regarding the organisms they most and least recently worked with (Fig. 6). We also  
182 found that participants’ perception that the species they most recently experienced is a model  
183 organism was positively related to multiple other attitudes about the same species with varying  
184 magnitudes: (1) strongly related to the impression that the behavioural literature on the species is  
185 extensive ( $r_s = 0.643$ ); (2) moderately related to the impression that the species is easy to buy ( $r_s$   
186  $= 0.456$ ), rear ( $r_s = 0.404$ ), and observe in the laboratory ( $r_s = 0.401$ ); (3) weakly related to the  
187 impression that the species is easy to find ( $r_s = 0.184$ ) and observe in the field ( $r_s = 0.119$ ).  
188 Furthermore, we also noted that participants’ agreement that the research they conducted (with the  
189 most recently experienced species mentioned) was applied was moderately linked to their

190 perception that the species is economically important ( $r_s = 0.331$ ) and weakly associated with their  
191 perception that the species is endangered or threatened in the wild ( $r_s = 0.241$ ).

192

## 193 **Discussion**

194 In the present study, we hypothesised that several factors (stemming from reason, context, or  
195 emotion, Fig. 1) are related to the selection of research organisms and thus drivers of taxonomic  
196 bias. The survey we conducted with ethologists and behavioural ecologists provides evidence in  
197 favour of this framework, although, in some cases, only at certain taxonomic levels. Below we  
198 discuss each of our main findings in detail, but see Appendix 2 for the discussion of our secondary  
199 results.

200         The taxonomic experiences of participants in our survey mirrored patterns of taxonomic  
201 bias present in the animal behaviour literature<sup>7,12</sup>. For instance, birds and mammals were the  
202 taxonomic groups participants in our survey were most likely to have worked with (Fig. S4; Fig.  
203 S5A). Conversely, with the exception of insects, participants rarely used invertebrates as research  
204 organisms (Fig. S4; Fig. S5A) despite their immense diversity<sup>18,44</sup>. Moreover, we observed that  
205 certain organisms (at the species or genus level) concentrated much of the attention given to their  
206 taxonomic group (Fig. S5B, C), reiterating that taxonomic bias also occurs at fine taxonomic  
207 levels<sup>16</sup>.

208         The popularity of taxonomic groups among participants in our survey was rarely associated  
209 with how easy they are to access and work with, showing that organisms' logistic aspects do not  
210 appear to be associated with their research use at high taxonomic levels. For example, with some  
211 exceptions, birds and (especially) mammals were considered as equally or more difficult to find,  
212 observe, rear, or buy than other taxonomic groups (Fig. 5). As a counterpoint, molluscs, which

213 were rarely used by surveyed scientists for research purposes (only 5.88% of participants worked  
214 with them; Fig. S4), were largely perceived as easy to work with both in the field and in the lab  
215 (Fig. 5). These results are not surprising as the necessary fieldwork duration to collect data from  
216 overlooked taxa (beetles and moths) is usually shorter than from popular taxa (mammals and  
217 birds)<sup>45</sup>. Nonetheless, within taxonomic groups, genera mentioned more frequently by participants  
218 tended to be perceived as easier to work with. This suggests that organisms with logistic  
219 advantages may be selected over other closely related taxa, a result that is congruent with studies  
220 investigating literature patterns related to specific taxonomic groups<sup>19,21–26</sup>.

221 We hypothesised that researchers also consider the possible applications of organisms to  
222 society, such as their economic relevance or conservation status, when deciding which research to  
223 pursue. We found that insects and mammals were deemed more economically important than  
224 arachnids and birds (mammals were also considered more economically important than reptiles).  
225 By contrast, insects were less frequently deemed as threatened or endangered in the wild than most  
226 taxonomic groups (including mammals, which were also more frequently deemed as endangered  
227 than arachnids). This finding is worrisome as invertebrates are under severe threat<sup>46</sup> yet remain  
228 underrepresented in biodiversity databases (e.g. IUCN's red list<sup>47</sup>) as most biodiversity  
229 assessments focus on birds and mammals, making the decline and extinction of invertebrates  
230 unnoticed<sup>48</sup>. This represents a striking example of the taxonomic bias vortex, in which lack of data  
231 generates the impression that no problem exists, leading to even less attention to the issue.  
232 Participants were also more likely to state that they had conducted applied research with species  
233 they deemed more economically important or more endangered in the wild. Strangely, the  
234 likelihood of participants conducting applied research was greater for mammals than for arachnids  
235 and insects (Fig. 6G) despite the latter being perceived as economically important as the former.

236 Within taxa, the number of participants working with a genus was positively related to its  
237 perception as economically relevant, but not with its perception as endangered in the wild. Our  
238 results indicate that organisms' aspects connected to their explicit usefulness to society can be  
239 involved in researchers' taxonomic decisions, but this influence seems to be weak, at least among  
240 ethologists and/or behavioural ecologists.

241 Participants appear to let their emotions lead their choice of research organisms as stronger  
242 affection for a taxonomic group corresponded with a higher likelihood of working with it among  
243 participants in our survey (Fig. 3B; Fig. S3). Given that the most popular taxonomic groups (e.g.  
244 birds and mammals) overwhelmingly elicited positive feelings from researchers (including those  
245 that never worked with them; Fig. S3), we argue that positive views of a taxon make researchers  
246 more likely to work with that taxon. Importantly, the patterns of fondness for distinct taxonomic  
247 groups we observed from surveyed researchers echoes values present in society, in which  
248 vertebrates are generally more well perceived than invertebrates<sup>30,31</sup>. We also found that  
249 participants' experiences with an organism stimulated more positive perceptions of its taxonomic  
250 group (Fig. 6B), whereas this effect was stronger for arachnids than for birds and mammals, and  
251 also stronger for fish than for mammals. The relationship between fondness and experience  
252 appears to be reciprocal: appreciation of a taxonomic group increases the likelihood of working  
253 with it, while experience with a taxonomic group enhances appreciation of it. This self-reinforcing  
254 cycle resembles a positive counterpart of the conceptual framework for biophobia, in which  
255 exposure to negative information about organisms causes fear and avoidance, leading to  
256 disconnection from nature, fortifying the cycle by strengthening the belief in and impact from  
257 negative perceptions of feared organisms<sup>37</sup>. Outreach programs thus remain crucial to promote  
258 awareness and appreciation of neglected taxonomic groups among the general public, countering

259 fear-based narratives commonly perpetuated by the media that only aggravate this dire  
260 situation<sup>37,49</sup>. Moreover, endorsing diverse taxonomic experiences in teaching and supervision  
261 within academia may also allow researchers to evaluate their options with less interference from  
262 damaging and alienating taxonomic perceptions.

263         Specific activities and preferences also appear to be connected to researchers' taxonomic  
264 choices. For example, participants were more likely to have engaged in (the equivalent of)  
265 birdwatching prior to working with a bird species than of having engaged in a similar hobby with  
266 an invertebrate taxon before having an experience with that taxon (Fig. 6A). This bolsters the idea  
267 that positive exposure to a taxonomic group elicits individuals to work with that group,  
268 highlighting that encouraging activities involving neglected taxonomic groups (e.g.  
269 bugwatching<sup>50</sup>) can generate research interest in the organisms involved. Furthermore, we found  
270 that surveyed researchers were diverse in their preference for fieldwork over lab work, ranging  
271 from complete to no preference (Fig. S2A). Greater preference for fieldwork was not associated  
272 with how many species or taxonomic groups a surveyed researcher worked with (Fig. 2), but it  
273 was positively related to greater appreciation of arachnids and vertebrates other than fish (Fig. 3A).  
274 Yet, greater preference for fieldwork was only positively related to the likelihood of working with  
275 birds and mammals, but not with amphibians and reptiles, and negatively related to the likelihood  
276 of working with fish and invertebrates other than molluscs (Fig. 3B). These findings suggest that  
277 professional preferences may influence scientists' fondness for certain taxa and their choices of  
278 research organisms (sometimes in conflicting ways).

279         Researchers also appear to vary in what motivates them, as some participants in our survey  
280 were exclusively driven by specific taxa while others were fully motivated by other factors (e.g.  
281 particular topics, professional prospects) (Fig. S2B). The more participants were motivated by

282 taxa, the more species but the fewer taxonomic groups they worked with (Fig. 2). This suggests  
283 that researchers primarily motivated by taxa are open to expanding their experience towards other  
284 (preferably neglected) species from the same taxonomic group, while their counterparts can be  
285 more easily inspired to diversify their experiences at a higher taxonomic level. Additionally,  
286 although motivation from taxa was not associated with fondness for any taxonomic group (Fig.  
287 3A), the fact that it was positively related to the likelihood of working with amphibians and  
288 arachnids (Fig. 3B) indicates that these two taxonomic groups are more likely to receive attention  
289 from researchers specifically interested in studying only them or few other taxa.

290 In our survey, participants frequently deemed several species as model organisms (e.g. barn  
291 swallows, crab-eating macaques) despite them not being officially listed as such (by USA's  
292 National Institute of Health<sup>51</sup>). Participants' agreement that an organism is a model system was  
293 positively related to the number of distinct participants mentioning the genus of that organism,  
294 indicating that this term is loosely applied to commonly studied species in a certain context (in our  
295 case, behavioural research). Species considered model organisms by participants in our survey  
296 were also more likely to be deemed easy to work with in the lab than in the field, confirming the  
297 connection of this term with experimental and laboratory work<sup>40,41,52,53</sup>. Despite this, the only  
298 difference across taxonomic groups we found was between fish and arachnids (Fig. 6C), which is  
299 surprising given that they are perceived as similarly accessible to work in the laboratory (Fig. 5C,  
300 D).

301 Given that the model organism label propulses taxonomic bias by rewarding and promoting  
302 species that have acquired an arbitrary status among researchers, we argue that this term should be  
303 abolished in most spheres of ecology and evolution. Moreover, even though species considered  
304 model organisms have generated breakthroughs in science<sup>42</sup>, they cannot replace the hidden gems

305 that biodiversity has to offer (e.g. bioinspired designs and materials<sup>54</sup>). We should thus facilitate  
306 research with different species, both in the field and in the laboratory, instead of re-using the same  
307 ones as a cheap trick to bypass a broken funding system. Recent technologies (e.g. drones, minute  
308 tracking devices<sup>55</sup>) and data sources (e.g. citizen science<sup>56,57</sup>) can certainly help with this, allowing  
309 ecology and evolution to reach its full potential.

310         Precedence effects can also occur at the individual level. Most participants in our survey  
311 mentioned working, in multiple stages of their career, with species that were suggested by their  
312 supervisors, albeit this pattern was weakened after participants obtained a permanent position (Fig.  
313 4). This means that the taxonomic experiences of early career researchers (ECRs) are largely  
314 influenced by late-career researchers (LCRs) they work with. ECRs often interact with few LCRs  
315 who can act as their mentors and/or supervisors (e.g. those employed by the university in which  
316 they study), representing a major bottleneck for ECRs' possible experiences, especially if LCRs  
317 only accept supervising research projects with a specific taxon. Because few LCRs work with  
318 neglected taxonomic groups, ECRs desiring to work with such groups are less likely to find  
319 supervisors who can support their interests. ECRs that manage to work with their predilected  
320 taxonomic group or those that do not have taxonomic preferences are then mostly bound to the  
321 specific organism suggested by the LCR supervising them. These processes can then dramatically  
322 reinforce existing taxonomic biases if researchers continue to work with the same taxonomic group  
323 or species throughout their career. Our findings suggest that researchers commonly take this route,  
324 stagnating or even amplifying taxonomic biases at multiple taxonomic levels. Fortunately, there  
325 are several tools that can help researchers to diversify their taxonomic experiences. For example,  
326 citizen science data (e.g. iNaturalist) can show species that are abundant in a given researcher's  
327 area, and enthusiasts (e.g. photographers, social media influencers) and other researchers (e.g.

328 taxonomists) may be happy to suggest species to study and ways of investigating them in the field  
329 and in the lab. To ameliorate this precedence effect, we recommend that (1) institutions consider  
330 the diversity of taxonomic experiences of LCRs when recruiting them, (2) LCRs adopt a flexible  
331 approach, supporting and motivating ECRs to engage with diverse taxa, (3) ECRs to search for  
332 distinct sources of information to expand their experiences.

333 Taxonomic bias generates a skewed perspective of natural processes and patterns, but it is  
334 only one of many biases affecting the study of ecology and evolution<sup>58</sup>. For example, biases in our  
335 perceptions of the sexes likely produce stereotypic portrayals of them<sup>59</sup> (e.g. coy females and eager  
336 males), which are common in the literature<sup>60-63</sup>. Misrepresentations of taxa, sexes, and other  
337 biological aspects curb the power of studies attempting to draw broad conclusions about nature.  
338 On one hand, gaps in the available data, if properly detected, only allow part of the puzzle to be  
339 revealed. For example, lack of data on sexual signals expressed by females and animals other than  
340 birds precludes a holistic understanding of the evolution of these traits<sup>10</sup>. Studies pointing out gaps  
341 in the literature can then direct researchers to collect data that is urgently needed<sup>64</sup>. However,  
342 researchers may infer erroneous conclusions when they fail to recognise that the data they analyse  
343 are biased. This is apparently a frequent issue in meta-analyses related to animal behaviour, in  
344 which the underrepresentation of invertebrates lead to improper generalisations<sup>3</sup>. Awareness of  
345 biases in science is essential for their detection and mitigation<sup>58</sup> and thus an important first step.  
346 However, we argue that we need to go beyond theoretical discussions by implementing actions  
347 that minimise the existing biases in ecology and evolution. Similar to pleas made by researchers  
348 combating biases in how sexes are represented in science<sup>65-67</sup>, we advocate for a more  
349 taxonomically equitable education (as early as childcare) and data collection. We hope that our

350 recommendations throughout the present study can then influence ecologists and evolutionary  
351 biologists to strive for such endeavour (but see also ref. <sup>12</sup>).

352

### 353 **Material and methods**

354 Our methodology was described in our pre-registration<sup>43</sup>. Although we adhered to it as much as  
355 possible, we included several post-hoc analyses in our study. We also note that part of our original  
356 plan was used to generate a separate study assessing existing patterns of taxonomic bias in ecology  
357 and evolution<sup>12</sup>. Aside from this, two main deviations from our pre-registration occurred. First,  
358 although some of our predictions were pre-registered (Table S1), many relationships we tested  
359 were not explicitly made in our pre-registration. Second, we initially planned to assess  
360 relationships between variables using a 7-point Likert scale with polychoric multivariate analyses.  
361 However, because applying this method on several pairs of variables from our dataset often  
362 violated statistical assumptions related to this method, we opted to use Spearman's correlations  
363 instead.

364

#### 365 *Survey with ethologists and behavioural ecologists*

366 PP and MK formulated a survey with three sections: (1) demographics, (2) preferences,  
367 experiences, and feelings, and (3) perceptions regarding species used by participants for  
368 behavioural research (Appendix 1). This survey was available online from 27 May 2025 to 21  
369 August 2025 to any person that desired to participate, was at least 18 years old, and had directly  
370 collected behavioural data from at least one non-human organism that led to at least one research  
371 output of which they were an author (e.g. conference poster or presentation, preprint, peer-  
372 reviewed publication, dissertation, thesis, book). No financial incentives were provided to

373 participants, and anonymity was maintained by collecting only their survey responses. Ethical  
374 approval for this study was obtained from the University of New South Wales' Human Research  
375 Ethics Committee (reference number iRECS8512).

376 PP recruited participants by sharing the link to the survey on the social media site *Bluesky*,  
377 through email chains, and via a targeted email list. This email list was obtained by extracting the  
378 emails associated with articles published in specific behaviour journals since 2015 and in certain  
379 general ecology and evolution journals since 2020 (see Table S10). This resulted in a list  
380 containing 20,818 unique email addresses, albeit 2,879 were invalid (i.e. undeliverable) and  
381 another 708 generated automatic replies indicating that their users were unavailable (e.g. out of  
382 the office) at the time of delivery. After accounting for these, 17,231 emails were considered to  
383 have most likely reached their intended recipients.

384 946 individuals completed the survey, representing approximately 5.49% of the  
385 recruitment emails sent that likely reached recipients. However, an exact estimate of the  
386 recruitment success for our survey could not be calculated as the identity of participants was not  
387 collected and the total number of individuals that were reached and were eligible to participate in  
388 the survey was unknown. For instance, emails associated with studies published in ecology and  
389 evolution journals may have reached researchers that had never collected behavioural data.

390 PP carefully examined the responses obtained and excluded 77 of them from the dataset:  
391 31 from participants that incorrectly answered the attention question in the survey (i.e. selected  
392 other options than agree for the question "please select the option agree"); seven responses with  
393 dubious veracity (a 99 years old participant, a participant that was 18 years old when they  
394 completed their PhD, and five participants with editorial experience despite not having a PhD); 37  
395 contradictory responses (nine participants that worked with a greater number of taxonomic groups

396 than of species, 28 participants that collected behavioural data of a species from a taxon they  
397 reported having no experience with); and three visibly duplicated responses (identical age, gender,  
398 country, year of PhD, species mentioned). As a result of these exclusions, 868 responses (91.75%  
399 of all responses obtained) were used for most analyses in the present study.

400 Participants mentioned up to two species for which they collected behavioural data in the  
401 survey (question 14, Appendix 1). PP only considered these specific responses as valid for analyses  
402 involving them when they represented a genus or a species (common names were transformed to  
403 latin names when possible). Consequently, PP excluded 86 answers out of the 1,666 obtained  
404 (5.16%) that were too vague (e.g. “insect” instead of a specific insect species or genus), contained  
405 multiple species, or were repeated by a participant (i.e. most and least recent species mentioned  
406 were the same).

407

#### 408 *Statistical analyses*

409 First, PP fitted two similar generalised linear models (GLMs): one with a negative binomial error  
410 distribution and the other with a Poisson error distribution. The response variable in the first GLM  
411 was the number of species that participants experienced, while the response variable in the second  
412 GLM was the number of taxonomic groups experienced (out of 11 options). Participant age  
413 (continuous), gender (men vs. women vs. other or unknown), editorial experience (binary: with vs.  
414 without), preference for fieldwork, and motivation from taxa served as predictor variables (the last  
415 two were treated as continuous variables even though participants provided responses in discrete  
416 increments of 10, ranging from 0 to 100). Additionally, the first GLM included the number of taxa  
417 experienced as a predictor variable, and the second GLM included the number of species  
418 experienced as a predictor variable.

419           Second, PP fitted cumulative linked models (CLMs) with a logit link on participants'  
420 feelings for each of the nine animal groups included in the survey (“other invertebrates” and “other  
421 organisms” were not included in question 11, see Appendix 1). In addition to the variables used in  
422 GLMs aforementioned (i.e. age, gender, editorial experience, preference for fieldwork, motivation  
423 from taxa), these CLMs also included experience with the taxon in question as a predictor variable  
424 (binary: with *vs.* without). Furthermore, to compare fondness for distinct taxonomic groups across  
425 participants, PP fitted a cumulative linked mixed model (CLMM) on all nine responses of how  
426 participants felt towards distinct taxa together, using participant ID as random factor and  
427 taxonomic group as a predictor variable in these CLMMs.

428           Third, PP fitted a separate GLM for each of the 11 taxonomic groups included in the survey  
429 (amphibians, arachnids, birds, crustaceans, fish, insects, mammals, molluscs, other invertebrates,  
430 other organisms, and reptiles), all using a binomial error distribution. The response variable in  
431 each of these GLMs indicated whether a participant had experience with the taxon in question. All  
432 of these GLMs included the same predictors aforementioned (age, gender, editorial experience,  
433 preference for fieldwork, and motivation from taxa) and, except for “other invertebrates” and  
434 “other organisms”, participants’ feelings for the taxon in question (factor with up to 7 levels).

435           Fourth, PP fitted a generalised linear mixed model (GLMM) using a binomial error  
436 distribution on whether species mentioned by participants were recommended to them for research  
437 purposes by their supervisor *vs.* others (i.e. other people or themselves). Predictor variables in this  
438 GLMM included whether the species mentioned was the most or least recently experienced by  
439 them, and when participants first worked with the species they mentioned (factor with three levels:  
440 during/before their PhD, during postdoc, or after obtaining a permanent position). Participant ID  
441 was then used as a random factor.

442 Fifth, PP fitted a distinct CLMM for each participants' agreement (7-point Likert scale) to  
443 a statement made in our survey related to the species they most recently experienced (questions  
444 19-31, Appendix 1) as well as to the species they least recently experienced (only questions 27 and  
445 28, Appendix 1). In these CLMMs, the taxonomic group of species mentioned by participants  
446 served as the only predictor variable. The genus of the species mentioned was used as a random  
447 factor in all CLMMs, while participant ID also served as a random factor for the CLMMs related  
448 to questions 27 and 28 (as there were up to two responses from each participant).

449 Sixth, PP fitted another set of CLMMs, again on participants' agreement to several  
450 statements, but particularly those involving easiness to work with the species mentioned (questions  
451 19-23, Appendix 1). Two predictor variables were used in these CLMMs: (1) the number of  
452 participants mentioning the genus that the species belonged to, and (2) participants' preference for  
453 fieldwork. In addition, the genus of the species mentioned was used as a random factor in CLMMs.

454 In all models described above, continuous predictor variables were scaled by subtracting  
455 the mean from each value and then dividing the result by the standard deviation. PP identified  
456 predictor variables associated with the response variables in all models mentioned above using  
457 model selection. He selected models whose Akaike Information Criterion corrected for small  
458 sample sizes (AICc) was within two units of the model with the lowest AICc. He then fitted  
459 simplified versions of these models by including only predictor variables that appeared in all  
460 selected models, i.e. he assumed that only these variables were associated with response variables.  
461 Lastly, PP used Spearman's correlations to verify pairwise relationships between variables that  
462 were on a 7-point Likert scale. Unless otherwise stated, means were presented with standard error.

463 PP conducted all analyses using R<sup>68</sup> v. 4.5.1. GLMMs were fitted using the package  
464 *glmmTMB*<sup>69,70</sup> v. 1.1.12 and ordinal regressions (CLMs and CLMMs) were conducted using the

465 package *ordinal*<sup>71</sup> v. 2023.12.4.1. PP verified GLMMs' assumptions using the package  
466 *DHARMA*<sup>72</sup> v. 0.4.7. and computed model predictions using the package *emmeans*<sup>73</sup> v. 1.11.2.8.  
467 PP used the package *MuMIn*<sup>74</sup> v. 1.48.11 to obtain and compare all possible candidate models from  
468 the complex models aforementioned.

469

#### 470 **Code and data accessibility**

471 All data and code used in this study are available at <https://zenodo.org/records/18719247>.

472

#### 473 **Acknowledgements**

474 We thank all survey participants for generously contributing their time, especially those that helped  
475 us to recruit more participants or reached out to us with feedback. We are also grateful to  
476 Jigmidmaa Boldbaatar, Russell Bonduriansky, Caitlin Nicole Creak, Kyle Morrison, Daniela  
477 Wilner, and Wai Chi Vicky Ying for helping us test our survey. We thank Catharina Vendl for  
478 feedback on the manuscript.

479

#### 480 **Author contributions**

481 PP: conceptualisation, methodology, formal analysis, investigation, data curation, writing -  
482 original draft, writing - review & editing, visualisation, project administration.

483 MK: methodology, writing - review & editing.

484

#### 485 **Competing interests**

486 The authors declare no conflicts of interest.

487

488 **References**

- 489 1. Shine, R. & Bonnet, X. Snakes: a new ‘model organism’ in ecological research? *Trends*  
490 *Ecol. Evol.* **15**, 221–222 (2000).
- 491 2. Bonnet, X., Shine, R. & Lourdaïs, O. Taxonomic chauvinism. *Trends Ecol. Evol.* **17**, 2000–  
492 2002 (2002).
- 493 3. Dochtermann, N., Sekhar, M. & Nakagawa, S. Ungeneralizable generalizations? A meta-  
494 meta-analysis of the influence of taxonomic bias on the study of behavior. *EcoEvoRxiv*  
495 Preprint at <https://doi.org/10.32942/X2XM06> (2025).
- 496 4. Clark, J. A. & May, R. M. Taxonomic bias in conservation research. *Science* **297**, 191–192  
497 (2002).
- 498 5. Leather, S. R. Taxonomic chauvinism threatens the future of entomology. *Biologist* **56**, 10–  
499 13 (2009).
- 500 6. Stahlschmidt, Z. R. Taxonomic chauvinism revisited: insight from parental care research.  
501 *PLoS One* **6**, e24192 (2011).
- 502 7. Rosenthal, M. F., Gertler, M., Hamilton, A. D., Prasad, S. & Andrade, M. C. B. Taxonomic  
503 bias in animal behaviour publications. *Anim. Behav.* **127**, 83–89 (2017).
- 504 8. Titley, M. A., Snaddon, J. L. & Turner, E. C. Scientific research on animal biodiversity is  
505 systematically biased towards vertebrates and temperate regions. *PLoS One* **12**, e0189577  
506 (2017).
- 507 9. Pollo, P., Lagisz, M., Yang, Y., Culina, A. & Nakagawa, S. Synthesis of sexual selection: a  
508 systematic map of meta-analyses with bibliometric analysis. *Biol Rev* **99**, 2134–2175  
509 (2024).

- 510 10. Pollo, P. *et al.* Synthesis of nature's extravaganza: an augmented meta-meta-analysis on  
511 (putative) sexual signals. *Ecol. Lett.* **28**, e70215 (2025).
- 512 11. Mizuno, A. *et al.* Systematic mapping and bibliometric analysis of meta-analyses on animal  
513 cognition. *Neurosci. Biobehav. Rev.* **177**, 106342 (2025).
- 514 12. Pollo, P. & Kasumovic, M. M. Taxonomic bias: a persistent issue in ecology and evolution.  
515 *EcoEvoRxiv* (2026).
- 516 13. Seddon, P. J., Soorae, P. S. & Launay, F. Taxonomic bias in reintroduction projects. *Anim.*  
517 *Conserv.* **8**, 51–58 (2005).
- 518 14. Mammola, S. *et al.* Towards a taxonomically unbiased European Union biodiversity  
519 strategy for 2030: popularity drives EU conservation. *Proc. R. Soc. B Biol. Sci.* **287**, (2020).
- 520 15. Guénard, B. *et al.* Limited and biased global conservation funding means most threatened  
521 species remain unsupported. *Proc Natl Acad Sci U S A* **122**, e2412479122 (2025).
- 522 16. Zuk, M., Garcia-Gonzalez, F., Herberstein, M. E. & Simmons, L. W. Model systems,  
523 taxonomic bias, and sexual selection: beyond *Drosophila*. *Annu. Rev. Entomol.* **59**, 321–  
524 338 (2014).
- 525 17. Troudet, J., Grandcolas, P., Blin, A., Vignes-Lebbe, R. & Legendre, F. Taxonomic bias in  
526 biodiversity data and societal preferences. *Sci. Rep.* **7**, 9132 (2017).
- 527 18. Zhang, Z.-Q. Animal biodiversity: an update of classification and diversity in 2013. *Zootaxa*  
528 **3703**, 5–11 (2013).
- 529 19. Silva, A. F. da *et al.* Taxonomic bias in amphibian research: are researchers responding to  
530 conservation need? *J. Nat. Conserv.* **56**, 125829 (2020).

- 531 20. Murray, H. J., Green, E. J., Williams, D. R., Burfield, I. J. & de Brooke, M. L. Is research  
532 effort associated with the conservation status of European bird species? *Endanger. Species*  
533 *Res.* **27**, 193–206 (2015).
- 534 21. Yarwood, M. R., Weston, M. A. & Symonds, M. R. E. Biological determinants of research  
535 effort on Australian birds: a comparative analysis. *Emu* **119**, 38–44 (2019).
- 536 22. Fischer, S. E., Otten, J. G., Lindsay, A. M., Miles, D. & Streby, H. Six-decade research bias  
537 towards fancy and familiar bird species. *Proc. R. Soc. B Biol. Sci.* **292**, (2025).
- 538 23. dos Santos, J. W. *et al.* Drivers of taxonomic bias in conservation research: a global analysis  
539 of terrestrial mammals. *Anim. Conserv.* **23**, 679–688 (2020).
- 540 24. Tam, J., Lagisz, M., Cornwell, W. & Nakagawa, S. Quantifying research interests in 7,521  
541 mammalian species with h-index: a case study. *Gigascience* **11**, 1–11 (2022).
- 542 25. Ellison, G., Jones, M., Cain, B. & Bettridge, C. M. Taxonomic and geographic bias in 50  
543 years of research on the behaviour and ecology of galagids. *PLoS One* **16**, 1–22 (2021).
- 544 26. Chen, T., Garber, P. A., Zhang, L., Yang, L. & Fan, P. The pattern and drivers of taxonomic  
545 bias in global primate research. *Glob. Ecol. Conserv.* **46**, e02599 (2023).
- 546 27. Mammola, S. *et al.* Drivers of species knowledge across the tree of life. *eLife* **12**, 1–23  
547 (2023).
- 548 28. Damasio, A. *Descartes' Error: Emotion, Reason, and the Human Brain.* (Avon Books, New  
549 York, NY, 1994).
- 550 29. Lorimer, J. Nonhuman charisma. *Environ. Plan. D* **25**, 911–932 (2007).
- 551 30. Miralles, A., Raymond, M. & Lecoindre, G. Empathy and compassion toward other species  
552 decrease with evolutionary divergence time. *Sci. Rep.* **9**, 1–8 (2019).

- 553 31. Possidónio, C., Graça, J., Piazza, J. & Prada, M. Animal images database: validation of 120  
554 images for human-animal studies. *Animals* **9**, 475 (2019).
- 555 32. Strommen, E. Lions and tigers and bears, oh my! Children's conceptions of forests and their  
556 inhabitants. *J. Res. Sci. Teach.* **32**, 683–698 (1995).
- 557 33. Snaddon, J. L., Turner, E. C. & Foster, W. A. Children's perceptions of rainforest  
558 biodiversity: which animals have the lion's share of environmental awareness? *PLoS One*  
559 **3**, 1–5 (2008).
- 560 34. Wei, H., Berdejo-Espinola, V., Ma, Y. & Amano, T. Content analysis of nature  
561 documentaries in China: challenges and opportunities to raise public conservation  
562 awareness. *Biol. Conserv.* **292**, 110522 (2024).
- 563 35. Gangwani, K. & Landin, J. The decline of insect representation in biology textbooks over  
564 time. *Am. Entomol.* **64**, 252–257 (2018).
- 565 36. Simaika, J. P. & Samways, M. J. Biophilia as a universal ethic for conserving biodiversity.  
566 *Conserv. Biol.* **24**, 903–906 (2010).
- 567 37. Soga, M., Gaston, K. J., Fukano, Y. & Evans, M. J. The vicious cycle of biophobia. *Trends*  
568 *Ecol. Evol.* **38**, 512–520 (2023).
- 569 38. Casola, W. *et al.* Evaluating household dynamics of wildlife preferences using toys. *Hum.*  
570 *Dimens. Wildl.* **31**, 155–160 (2026).
- 571 39. Fleischner, T. L. *et al.* Teaching biology in the field: importance, challenges, and solutions.  
572 *Bioscience* **67**, 558–567 (2017).
- 573 40. Leonelli, S. & Ankeny, R. A. Re-thinking organisms: the impact of databases on model  
574 organism biology. *Stud. Hist. Philos. Biol. Biomed. Sci.* **43**, 29–36 (2012).

- 575 41. Leonelli, S. & Ankeny, R. A. What makes a model organism? *Endeavour* **37**, 209–212  
576 (2013).
- 577 42. Fields, S. & Johnston, M. Whither model organism research? *Science* **307**, 1885–1886  
578 (2005).
- 579 43. Pollo, P. & Kasumovic, M. M. Taxonomic bias in ethology and behavioural ecology:  
580 patterns, origins, and solutions, a protocol. <https://doi.org/10.17605/OSF.IO/YNMBD>  
581 (2025).
- 582 44. Eisenhauer, N. & Hines, J. Invertebrate biodiversity and conservation. *Curr. Biol.* **31**,  
583 R1214–R1218 (2021).
- 584 45. Pawar, S. Taxonomic chauvinism and the methodologically challenged. *Bioscience* **53**,  
585 861–864 (2003).
- 586 46. Cardoso, P. *et al.* Scientists’ warning to humanity on insect extinctions. *Biol. Conserv.* **242**,  
587 (2020).
- 588 47. Cardoso, P., Borges, P. A. V., Triantis, K. A., Ferrández, M. A. & Martín, J. L. The  
589 underrepresentation and misrepresentation of invertebrates in the IUCN Red List. *Biol.*  
590 *Conserv.* **149**, 147–148 (2012).
- 591 48. Régnier, C. *et al.* Mass extinction in poorly known taxa. *Proc. Natl. Acad. Sci. U. S. A.* **112**,  
592 7761–7766 (2015).
- 593 49. Mammola, S., Nanni, V., Pantini, P. & Isaia, M. Media framing of spiders may exacerbate  
594 arachnophobic sentiments. *People Nat.* **2**, 1145–1157 (2020).
- 595 50. Eaton, E. R. *Bugwatching: The Art, Joy, and Importance of Observing Insects*. (Princeton  
596 University Press, Princeton, NJ, 2025).

- 597 51. NIH. Model organism sharing policy. [https://grants.nih.gov/policy-and-compliance/policy-](https://grants.nih.gov/policy-and-compliance/policy-topics/sharing-policies/other/model-organism)  
598 [topics/sharing-policies/other/model-organism](https://grants.nih.gov/policy-and-compliance/policy-topics/sharing-policies/other/model-organism) (2025).
- 599 52. Dietrich, M. R., Ankeny, R. A. & Chen, P. M. Publication trends in model organism  
600 research. *Genetics* **198**, 787–794 (2014).
- 601 53. Matthews, B. J. & Vosshall, L. B. How to turn an organism into a model organism in 10  
602 ‘easy’ steps. *J. Exp. Biol.* **223**, (2020).
- 603 54. Ortiz, C. & Boyce, M. C. Bioinspired structural materials. *Science* **319**, 1053–1054 (2008).
- 604 55. Farine, D. R., Penndorf, J., Bolcato, S., Nyaguthii, B. & Aplin, L. M. Low-cost animal  
605 tracking using Bluetooth low energy beacons on a crowd-sourced network. *Methods Ecol.*  
606 *Evol.* **15**, 2247–2261 (2024).
- 607 56. Niemiller, K. D. K., Davis, M. A. & Niemiller, M. L. Addressing ‘biodiversity naivety’  
608 through project-based learning using iNaturalist. *J. Nat. Conserv.* **64**, (2021).
- 609 57. Mason, B. M. *et al.* iNaturalist accelerates biodiversity research. *Bioscience* **75**, 953–965  
610 (2025).
- 611 58. Winder, L. A. *et al.* Known and unknown biases: a framework for contextualising and  
612 identifying bias in animal behaviour research. *Ethology* 1–8 (2025) doi:10.1111/eth.70019.
- 613 59. Pollo, P. & Kasumovic, M. M. Let’s talk about sex roles: what affects perceptions of sex  
614 differences in animal behaviour? *Anim. Behav.* **183**, 1–12 (2022).
- 615 60. Green, K. K. & Madjidian, J. A. Active males, reactive females: stereotypic sex roles in  
616 sexual conflict research? *Anim. Behav.* **81**, 901–907 (2011).
- 617 61. Ah-King, M. The history of sexual selection research provides insights as to why females  
618 are still understudied. *Nat. Commun.* **13**, 6976 (2022).

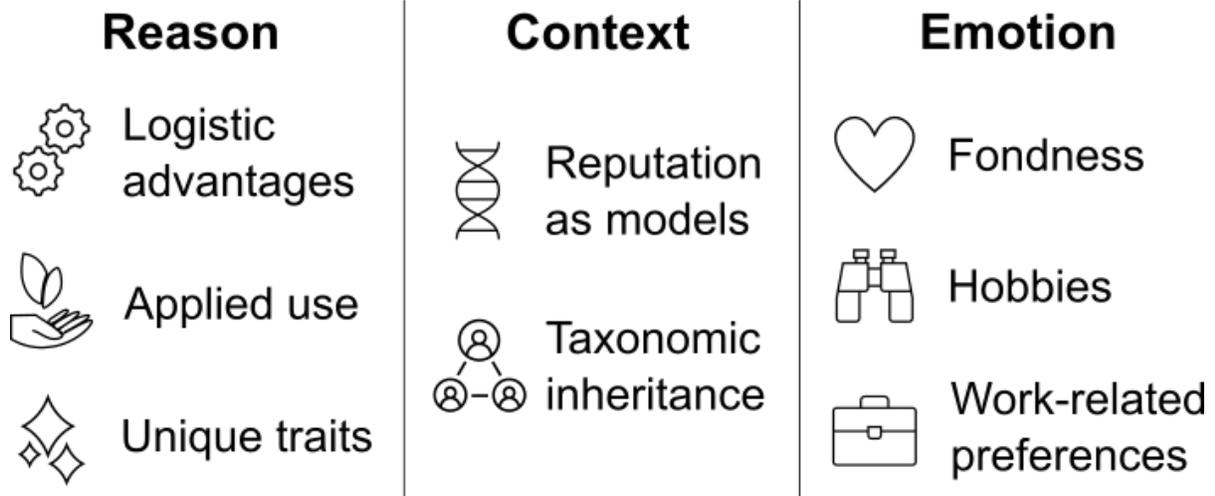
- 619 62. Ah-King, M. *The Female Turn*. (Springer Nature Singapore, Singapore, 2022).  
620 doi:10.1007/978-981-19-7161-7.
- 621 63. Spaulding, S. & Fuselier, L. Images of nonhuman animals in animal behaviour textbooks  
622 communicate an androcentric view of reproductive-related behaviours. *Anim. Behav.* **205**,  
623 117–129 (2023).
- 624 64. Pollo, P. *et al.* Harnessing meta-analyses' insights in ecology and evolution research. *R.*  
625 *Soc. Open Sci.* **12**, 250759 (2025).
- 626 65. Ah-King, M. Queering animal sexual behavior in biology textbooks. *Confero Essays on*  
627 *Education Philosophy and Politics* **1**, 46–89 (2013).
- 628 66. Zemenick, A. T., Turney, S., Webster, A. J., Jones, S. C. & Weber, M. G. Six principles for  
629 embracing gender and sexual diversity in postsecondary biology classrooms. *Bioscience* **72**,  
630 481–492 (2022).
- 631 67. Hughes, M. Student preconceptions of sex differences in animal behaviour classes:  
632 observations, recommendations and need for research. *Anim. Behav.* **192**, 95–100 (2022).
- 633 68. R Core Team. R: a language and environment for statistical computing. [https://www.r-](https://www.r-project.org/)  
634 [project.org/](https://www.r-project.org/) (2025).
- 635 69. Brooks, Mollie, E. *et al.* glmmTMB balances speed and flexibility among packages for zero-  
636 inflated generalized linear mixed modeling. *R J.* **9**, 378 (2017).
- 637 70. McGillicuddy, M., Warton, D. I., Popovic, G. & Bolker, B. M. Parsimoniously fitting large  
638 multivariate random effects in glmmTMB. *J. Stat. Softw.* **112**, (2025).
- 639 71. Christensen, R. H. B. ordinal - regression models for ordinal data. [https://cran.r-](https://cran.r-project.org/package=ordinal)  
640 [project.org/package=ordinal](https://cran.r-project.org/package=ordinal) (2023).

- 641 72. Hartig, F. DHARMA: residual diagnostics for hierarchical (multi-level/mixed) regression  
642 models. <https://doi.org/10.32614/CRAN.package.DHARMA> (2016).
- 643 73. Lenth, R. V. emmeans: estimated marginal means, aka least-squares means.  
644 <https://doi.org/10.32614/CRAN.package.emmeans> (2025).
- 645 74. Bartoń, K. MuMIn: multi-model inference. <https://cran.r-project.org/package=MuMIn>  
646 (2023).
- 647 75. Mann, M. D. Choosing the right species in research. *Lab Anim.* **44**, 274–278 (2015).
- 648 76. Clutton-Brock, T. H. *The Evolution of Parental Care*. (Princeton University Press,  
649 Princeton, New Jersey, 1991).
- 650 77. Mailho-Fontana, P. L. *et al.* Milk provisioning in oviparous caecilian amphibians. *Science*  
651 **383**, 1092–1095 (2024).
- 652 78. Stay, B. & Coop, A. C. ‘Milk’ secretion for embryogenesis in a viviparous cockroach.  
653 *Tissue Cell* **6**, 669–693 (1974).
- 654 79. Chen, Z. *et al.* Prolonged milk provisioning in a jumping spider. *Science* **362**, 1052–1055  
655 (2018).
- 656 80. Casad, B. J. *et al.* Gender inequality in academia: problems and solutions for women faculty  
657 in STEM. *J. Neurosci. Res.* **99**, 13–23 (2021).
- 658 81. Spoon, K. *et al.* Gender and retention patterns among U.S. faculty. *Sci. Adv.* **9**, 1–12 (2023).
- 659 82. Fredrikson, M., Annas, P., Fischer, H. & Wik, G. Gender and age differences in the  
660 prevalence of specific fears and phobias. *Behav. Res. Ther.* **34**, 33–39 (1996).
- 661 83. Fox, C. W., Meyer, J. & Aimé, E. Double-blind peer review affects reviewer ratings and  
662 editor decisions at an ecology journal. *Funct. Ecol.* **37**, 1144–1157 (2023).

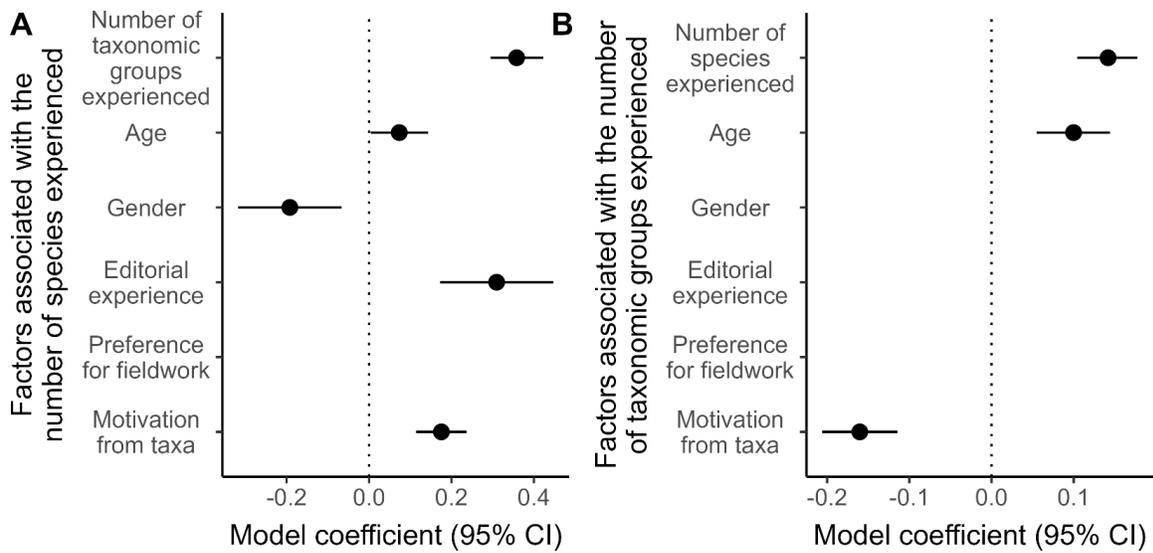
663 84. Srivastava, D. S. *et al.* Editors are biased too: an extension of Fox et al. (2023)'s analysis  
664 makes the case for triple-blind review. *Funct. Ecol.* **38**, 278–283 (2024).

665

## *Why are organisms selected for research?*

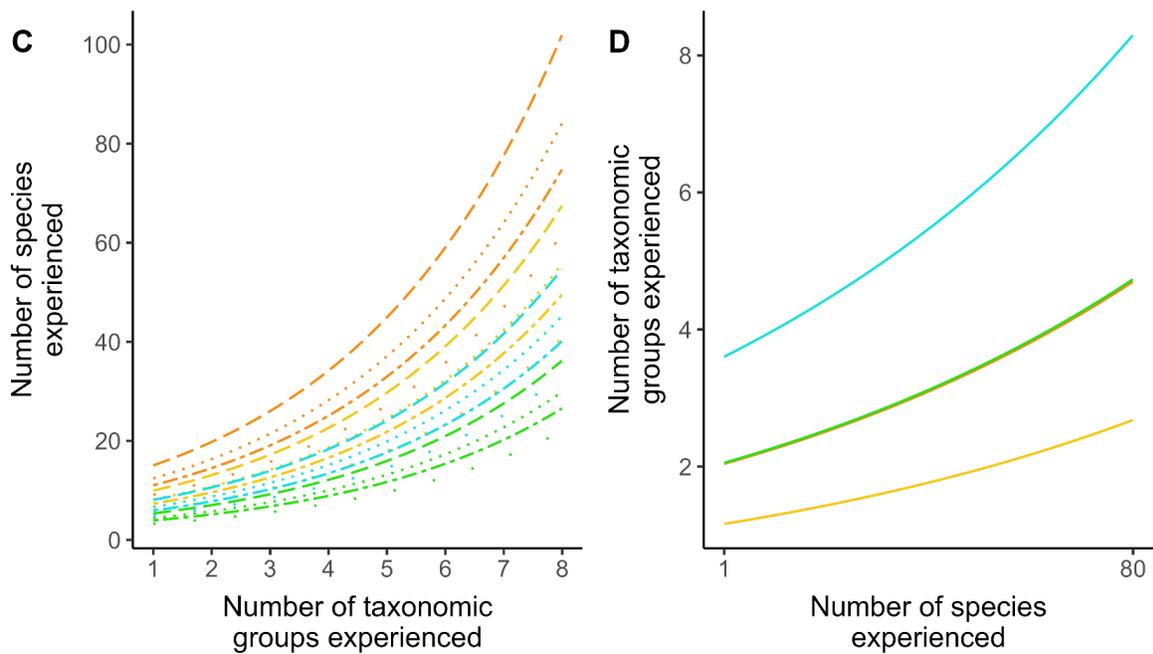


669 Figure 1. Factors hypothesised to be associated with the selection of research organisms in ecology



Gender and editorial experience      Motivation from taxa and age

- - - Man, with      - · - Man, without      — Maximum, oldest      — Maximum, youngest  
 · · · Woman, with      · · · Woman, without      — Minimum, oldest      — Minimum, youngest



671

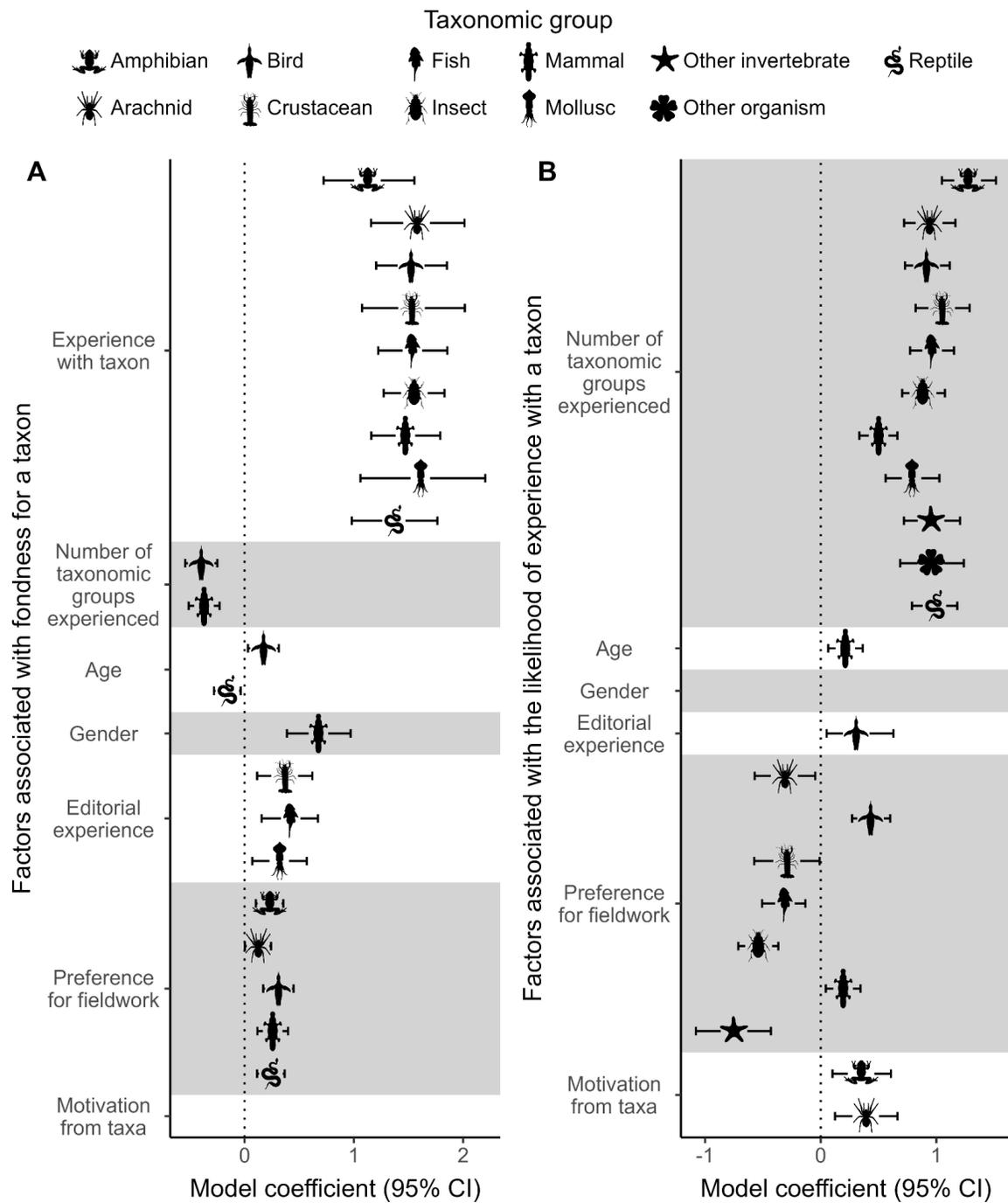
672 Figure 2. Factors associated with participants' experiences. Top panels show coefficient values for

673 factors associated with the number of species (A) and taxonomic groups (B) that participants

674 worked with. Gender refers to the comparison of women vs. men (comparisons with other or

675 unknown gender identities are not shown). Note that only coefficients from factors included in all  
676 selected models are shown. Bottom panels show the number of species (C) and taxonomic groups  
677 (D) that participants worked with predicted by selected models. Maximum and minimum  
678 motivation from taxa refer to 100% and 0% of this variable (respectively), while oldest and  
679 youngest represent 82 and 21 years old individuals (respectively).

680



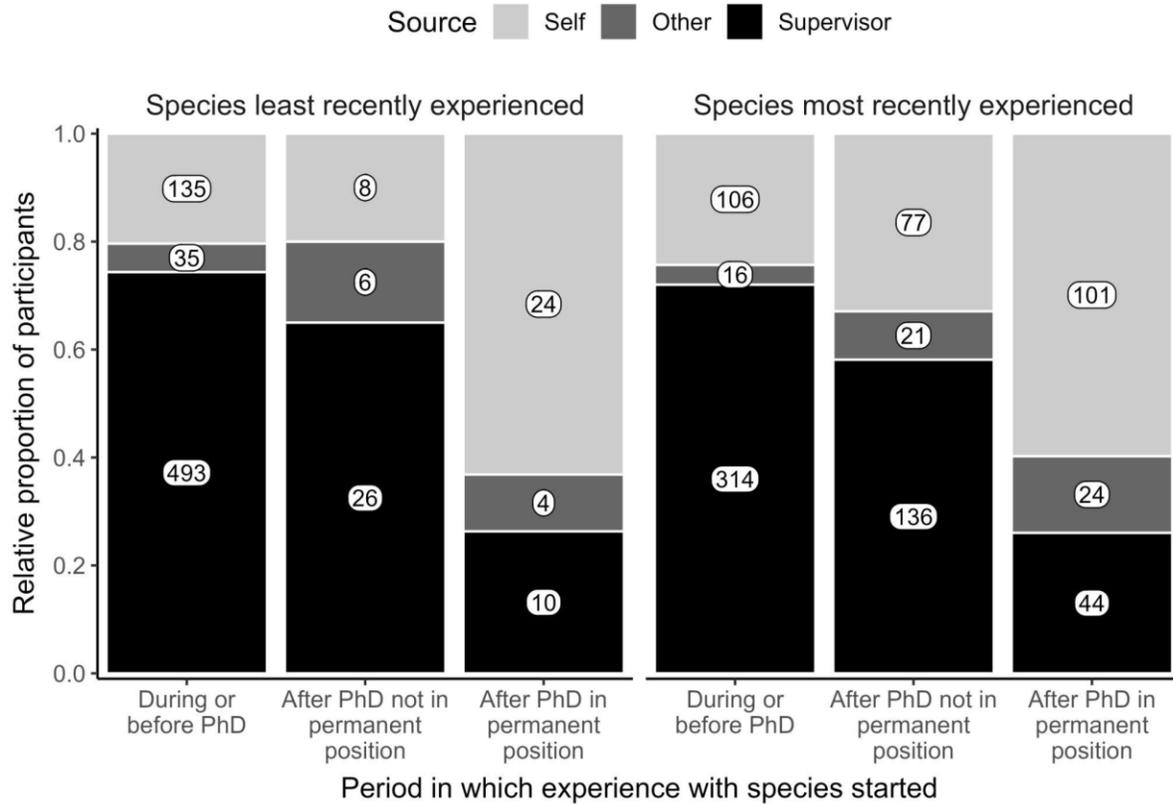
681

682 Figure 3. Factors associated with fondness for (A) and experience with (B) a given taxonomic

683 group. Gender refers to the comparison of women vs. men (comparisons with other or unknown

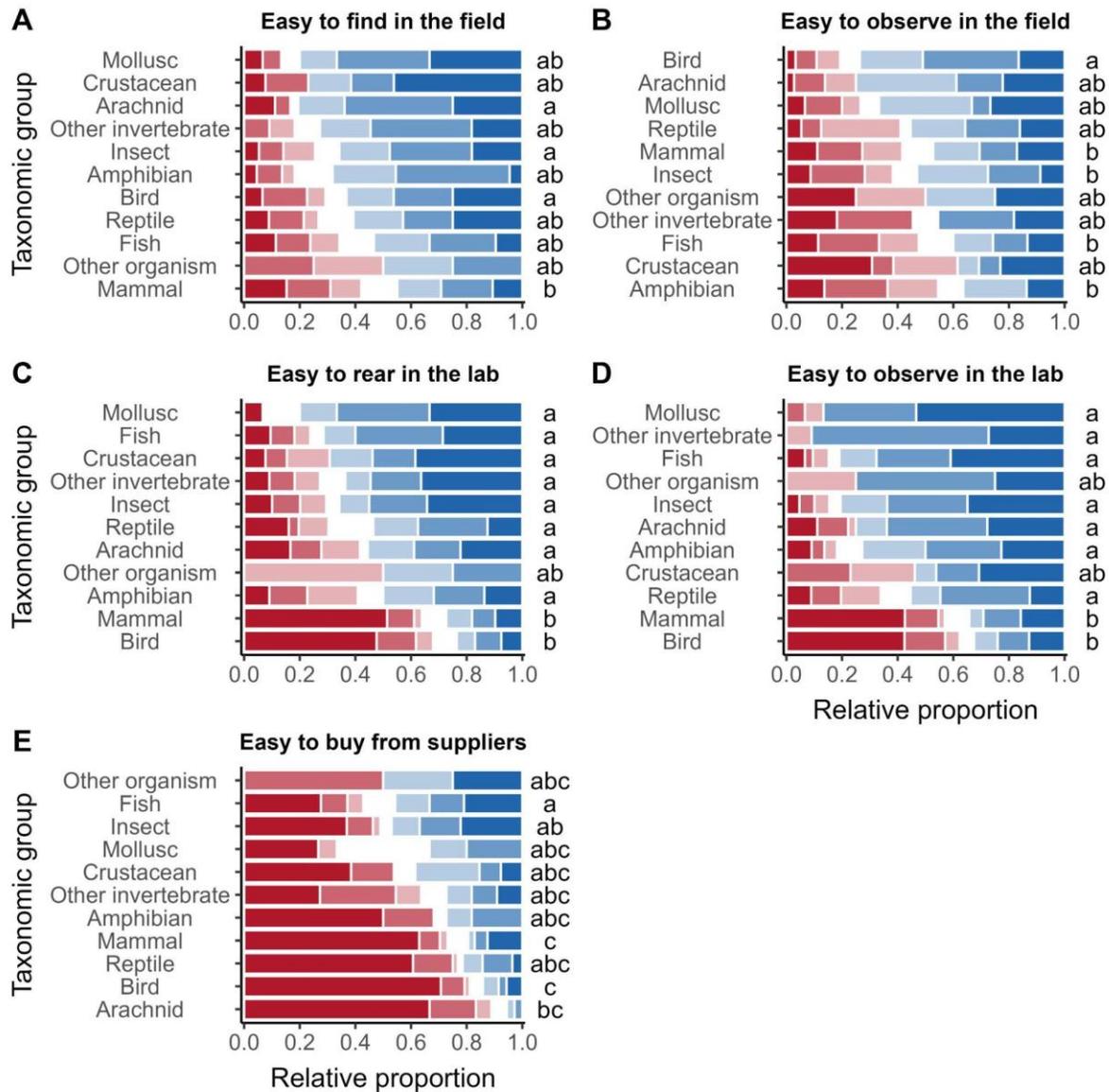
684 gender identities are not shown). Fondness for a taxon was also included as a predictor in models

685 exploring the factors associated with the likelihood of experience with that taxon (B), but  
 686 coefficients are not shown. Background colours highlight coefficients associated with different  
 687 factors.  
 688



689  
 690 Figure 4. How and when participants started working with certain species. Numbers within bars  
 691 represent the number of participants within that category.

692  
 693



694

695 Figure 5. Ease of working with certain organisms. Regarding the organism they most recently

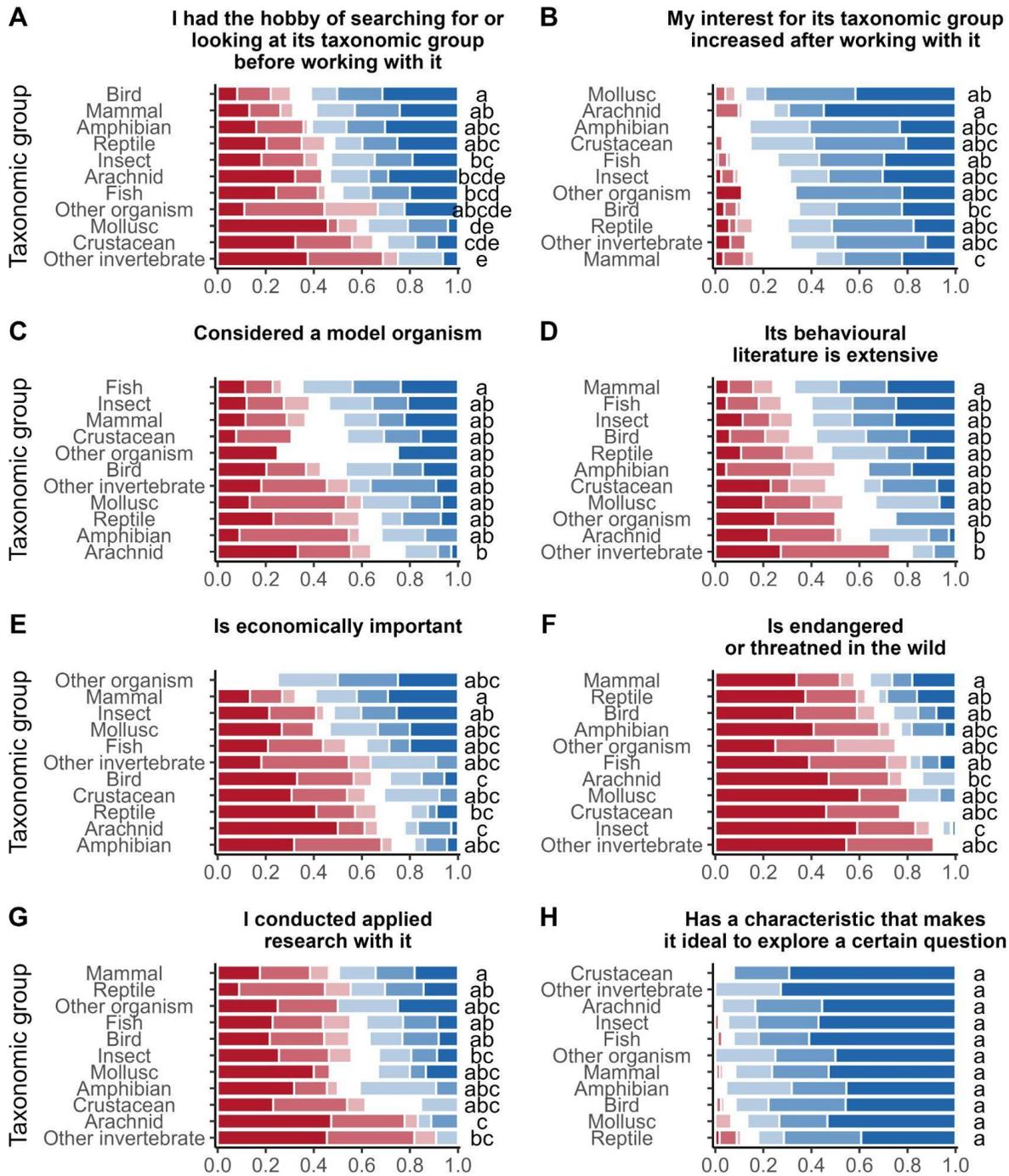
696 worked with, participants' agreement with statements related to the ease to locate it in the field

697 (A), observe it in the field (B), rear it in the lab (C), observe it in the lab (D), buy it from suppliers

698 (E). Distinct letters on the right-side of bars represent statistical differences between taxonomic

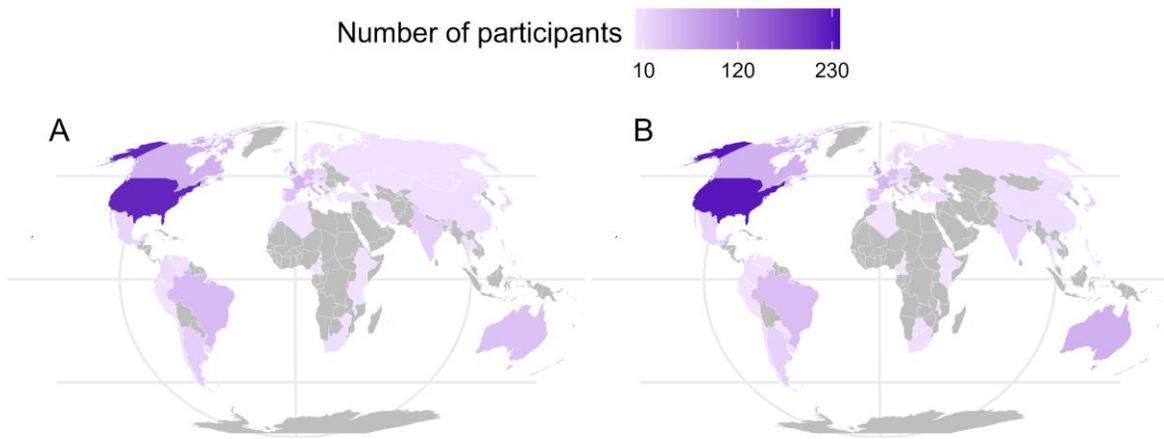
699 groups within that panel (z-values with  $p < 0.05$  for all pairwise comparisons).

700



701  
 702 Figure 6. Participants' agreement with various statements related to one or two organisms they  
 703 worked with. Distinct letters on the right-side of bars represent statistical differences between  
 704 taxonomic groups within that panel (z-values with  $p < 0.05$  for all pairwise comparisons)

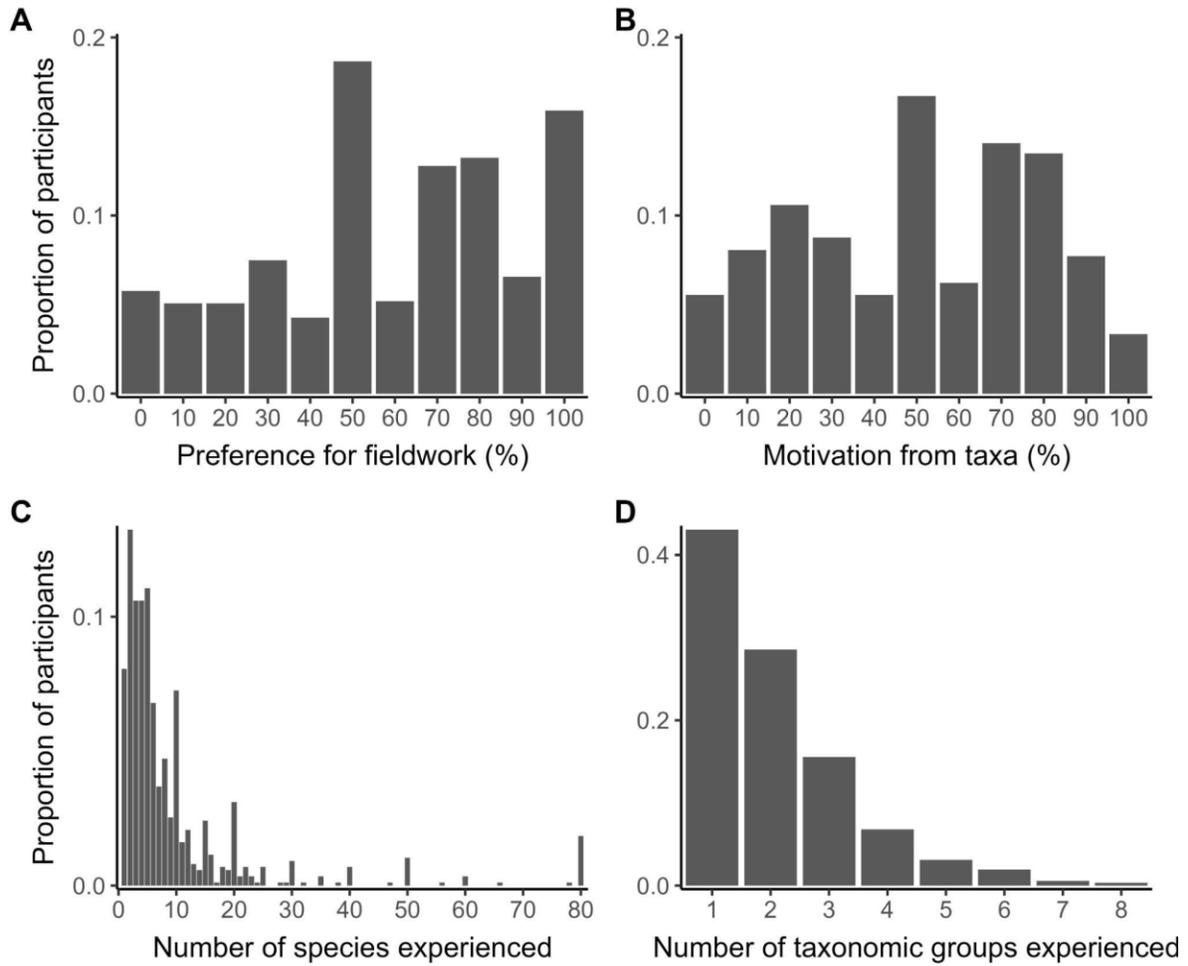
705 **Supplementary figures**



706

707 Figure S1. Participants' country. Country in which participants spent most of their life before (A)

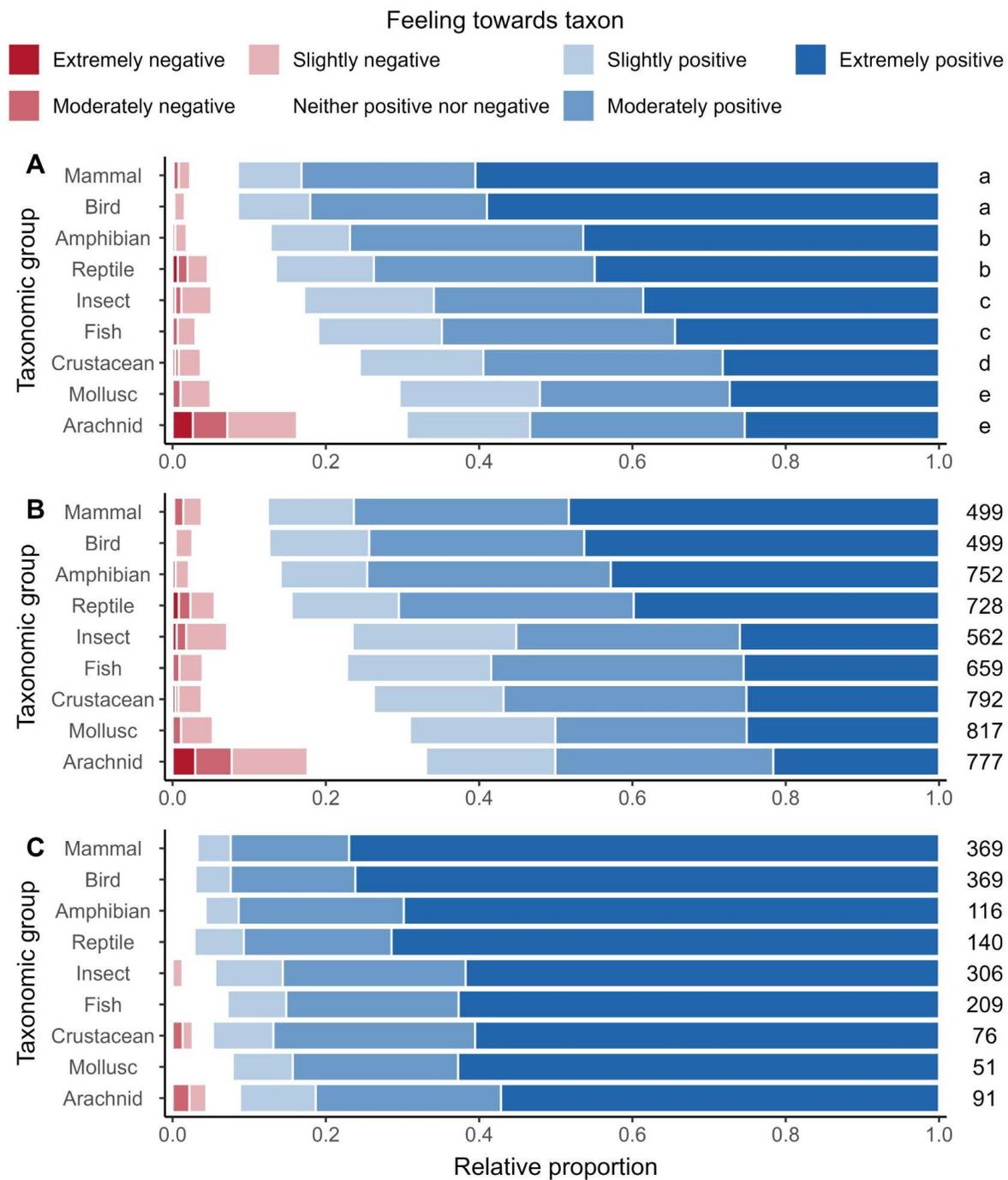
708 and after (B) being 18 years old. No participants mentioned countries or regions in grey.



709

710 Figure S2. Participants' preferences, motivations, and overall experiences. Proportion of  
 711 participants expressing their preference for fieldwork over lab work (A) and their motivation from  
 712 taxa over other factors (B). Proportion of participants that experienced (i.e. collected behavioural  
 713 data from) distinct numbers of species (C), and of taxonomic groups (D).

714



715

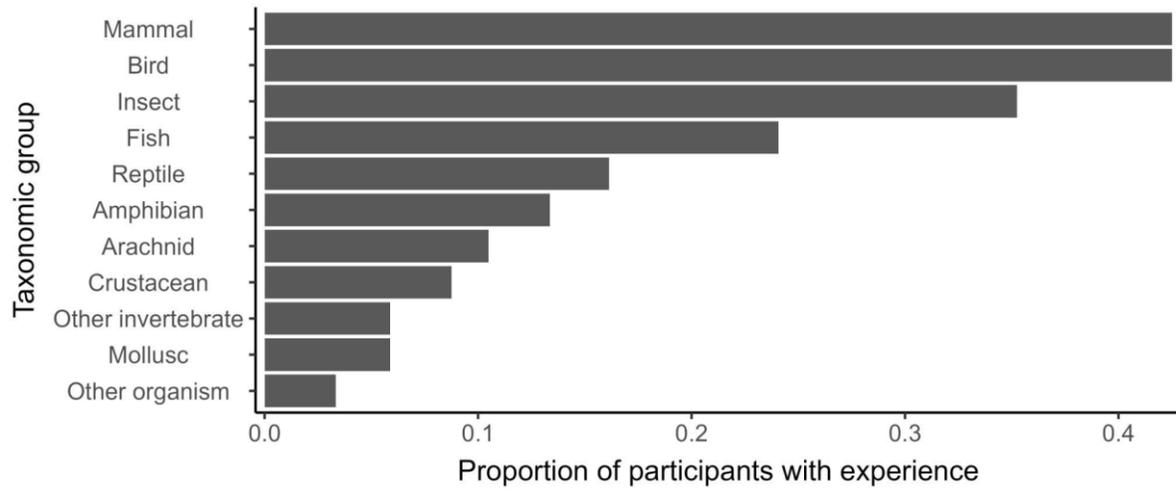
716 Figure S3. Participants' feelings towards distinct animal groups. Responses from all participants

717 together (A) or by experience with the taxon in question (B: without, C: with). In panel A, distinct

718 letters on the right-side of bars represent statistical differences between taxonomic groups within

719 that panel (z-values with  $p < 0.05$  for all pairwise comparisons). In panels B and C, numbers on  
720 the right-side of bars represent the number of participants for each taxon in the subset presented,  
721 with a total of 868 for each taxon.

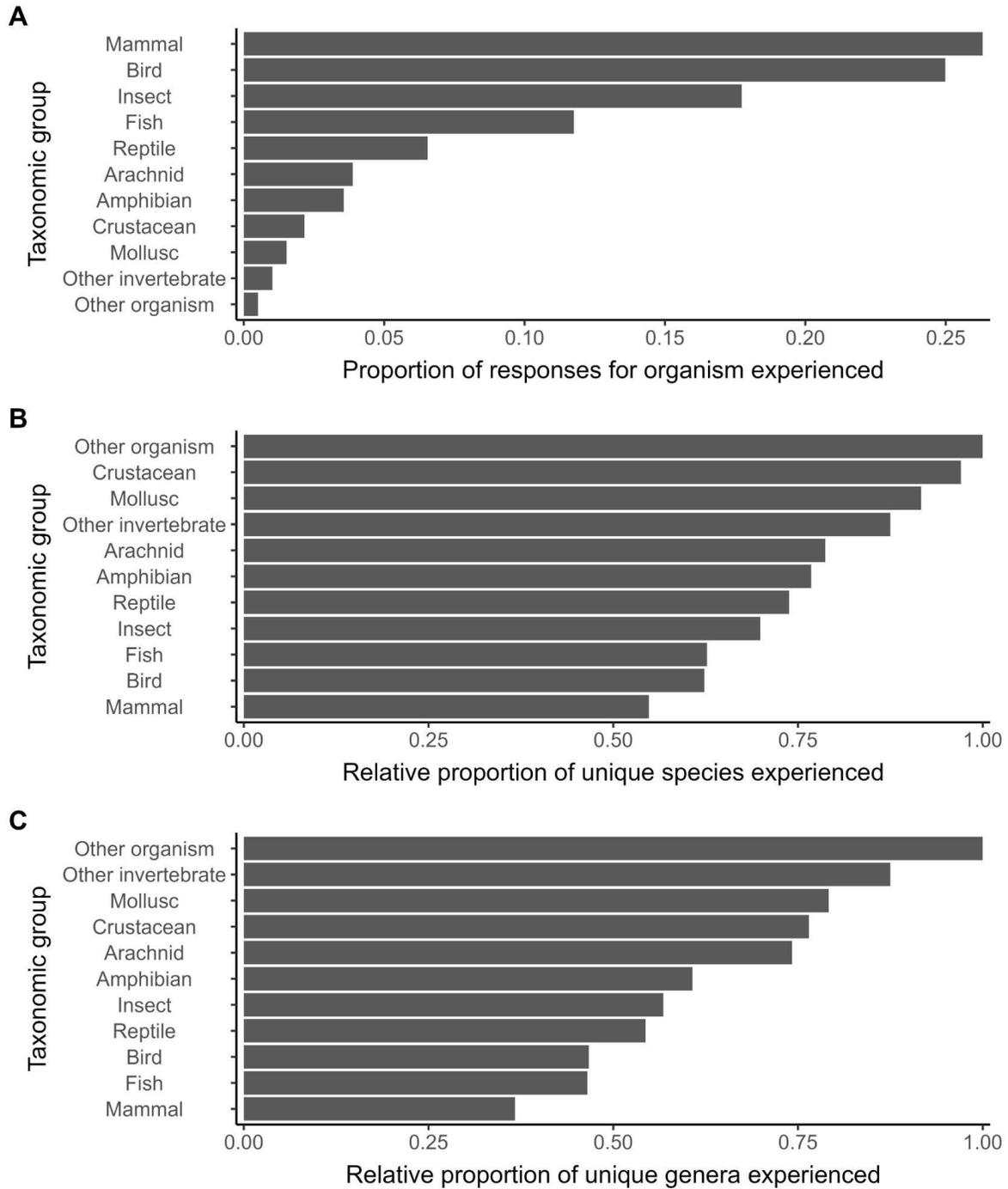
722



723

724 Fig. S4. Taxonomic groups with which participants had experience with. Note that each participant  
725 could have experience with multiple taxa.

726



727

728 Figure S5. Taxonomic groups of specific species that participants had experience with.

729 **Supplementary tables**

730 *Table S1.*

731 Pre-registered predictions (see Pollo & Kasumovic 2025).

<b>Prediction</b>	<b>Supported?</b>
Participants that work with vertebrate animals, especially birds and mammals, disclose that their interest is more strongly driven by taxon (opposed to other motivations) than other participants	No
Vertebrate animals, especially birds and mammals, elicit more positive feelings from participants than other taxa	Yes
Taxa that participants worked with elicit more positive feelings from them compared with other taxa	Yes
An employer, supervisor, or collaborator is responsible for selecting research species in most cases, except when the participant holds a permanent research position mentioning their most recently studied species.	Yes
Vertebrate animals, especially birds and mammals, are perceived as harder to rear and maintain in the lab, and easier to observe or record in the field, compared with other taxa	Mixed
Participants working with birds are more likely to have engaged in cultural activities involving the observation of their study organism before conducting research on it than participants working with other organisms	Mixed
Participants from anglophone countries are more likely to have engaged in cultural activities involving bird observation (i.e. birdwatching) before conducting research on birds than participants from non-anglophone countries.	No
A participant's preference for data collection in the field opposed to in the lab is positively related to their opinion of the species they mention being easy to be located/attracted and recorded/observed in the field, and negatively related to their opinion of the species being easy to be maintained and reared in the lab.	Yes
A participant's opinion that a species is considered a model organism by the scientific community is positively associated with their opinion of how extensive the behavioural literature on that species is.	Yes
A participant's opinion that a species is considered a model organism by the scientific community is positively associated with their opinion of how easy and accessible it is to obtain, maintain, and observe that species in the lab or in the field, but rarely both	Mixed
Organisms perceived as economically relevant are more frequently used in applied research than those perceived as economically irrelevant	Yes

732

733

734 Table S2.

735 Model comparison regarding the number of species experienced by participants in our survey.  
736 Several possible predictor variables were tested (see main text for details). “+” represents that the  
737 predictor variable was included in models shown. *AICc* and *W* stand for models’ Akaike  
738 information criterion for small sample sizes and their weight, respectively. Only selected models  
739 (i.e.  $\Delta AICc < 2$ ) are shown.

Rank	Predictor variables						<i>AICc</i>	$\Delta AICc$	<i>W</i>
	Number of taxonomic groups experienced	Age	Gender	Editorial experience	Preference for fieldwork	Motivation from taxa			
1	+	+	+	+		+	5510.72	0.00	0.50
2	+	+	+	+	+	+	5512.45	1.73	0.21

740

741 Table S3.

742 Model comparison regarding the number of taxonomic groups experienced by participants in our  
743 survey. Several possible predictor variables were tested (see main text for details). “+” represents  
744 that the predictor variable was included in models shown. *AICc* and *W* stand for models’ Akaike  
745 information criterion for small sample sizes and their weight, respectively. Only selected models  
746 (i.e.  $\Delta AICc < 2$ ) are shown.

Rank	Predictor variables						<i>AICc</i>	$\Delta AICc$	<i>W</i>
	Number of species experienced	Age	Gender	Editorial experience	Preference for fieldwork	Motivation from taxa			
1	+	+		+		+	2681.64	0.00	0.25
2	+	+				+	2682.02	0.39	0.21
3	+	+		+	+	+	2683.16	1.53	0.12
4	+	+	+	+		+	2683.16	1.53	0.12
5	+	+	+			+	2683.49	1.86	0.10
6	+	+			+	+	2683.59	1.96	0.09

747

748

749 Table S4.

750 Model comparison regarding the fondness by participants in our survey for each taxonomic group.  
 751 Several possible predictor variables were tested (see main text for details). “+” represents that the  
 752 predictor variable was included in in models shown. *AICc* and *W* stand for models’ Akaike  
 753 information criterion for small sample sizes and their weight, respectively. Only selected models  
 754 (i.e.  $\Delta AICc < 2$ ) are shown.

Taxon	Rank	Predictor variables							<i>AICc</i>	$\Delta AICc$	<i>W</i>
		Experience	Number of taxonomic groups experienced	Age	Gender	Editorial experience	Preference for fieldwork	Motivation from taxa			
Amphibian	1	+				+	+	2186.14	0.00	0.09	
Amphibian	2	+				+	+	2186.35	0.21	0.08	
Amphibian	3	+					+	2186.40	0.26	0.08	
Amphibian	4	+		+		+	+	2186.58	0.44	0.07	
Amphibian	5	+	+		+	+	+	2187.30	1.16	0.05	
Amphibian	6	+			+		+	2187.38	1.24	0.05	
Amphibian	7	+	+				+	2187.44	1.30	0.05	
Amphibian	8	+	+			+	+	2187.49	1.35	0.04	
Amphibian	9	+	+	+		+	+	2187.51	1.37	0.04	
Amphibian	10	+		+	+	+	+	2187.55	1.41	0.04	
Amphibian	11	+	+		+		+	2187.94	1.81	0.03	
Amphibian	12	+				+	+	2188.10	1.97	0.03	
Arachnid	1	+		+			+	2958.94	0.00	0.08	
Arachnid	2	+		+			+	2959.60	0.66	0.06	
Arachnid	3	+					+	2960.18	1.24	0.04	
Arachnid	4	+				+	+	2960.51	1.57	0.04	
Arachnid	5	+		+		+	+	2960.61	1.67	0.04	
Arachnid	6	+	+	+			+	2960.67	1.74	0.03	
Arachnid	7	+	+	+			+	2960.74	1.8	0.03	
Arachnid	8	+					+	2960.78	1.84	0.03	
Arachnid	9	+		+	+		+	2960.78	1.85	0.03	
Bird	1	+	+	+			+	1846.31	0.00	0.26	
Bird	2	+	+	+	+		+	1846.94	0.63	0.19	
Bird	3	+	+	+		+	+	1847.96	1.65	0.11	
Crustacean	1	+				+		2544.91	0	0.14	
Crustacean	2	+				+		2545.31	0.4	0.12	
Crustacean	3	+	+			+		2545.65	0.74	0.10	
Crustacean	4	+	+			+		2546.59	1.68	0.06	
Crustacean	5	+		+		+		2546.85	1.94	0.05	
Fish	1	+				+		2399.70	0.00	0.10	
Fish	2	+				+	+	2399.97	0.28	0.09	
Fish	3	+		+		+		2400.10	0.40	0.08	
Fish	4	+		+		+	+	2400.50	0.80	0.07	
Fish	5	+				+	+	2400.97	1.27	0.05	
Fish	6	+				+	+	2401.11	1.41	0.05	
Fish	7	+	+			+		2401.39	1.69	0.04	
Fish	8	+		+		+	+	2401.47	1.77	0.04	
Fish	9	+		+		+	+	2401.48	1.78	0.04	
Fish	10	+	+	+		+		2401.51	1.82	0.04	
Fish	11	+	+			+	+	2401.62	1.92	0.04	
Insect	1	+				+		2425.11	0.00	0.07	
Insect	2	+						2425.51	0.40	0.05	
Insect	3	+	+			+		2425.64	0.52	0.05	
Insect	4	+				+	+	2426.12	1.01	0.04	
Insect	5	+					+	2426.49	1.38	0.03	
Insect	6	+	+			+	+	2426.50	1.39	0.03	
Insect	7	+	+					2426.55	1.43	0.03	
Insect	8	+		+				2426.79	1.67	0.03	
Insect	9	+			+			2426.88	1.77	0.03	
Insect	10	+			+	+		2426.96	1.85	0.03	
Insect	11	+				+	+	2427.04	1.93	0.03	

Insect	12	+		+		+			2427.08	1.96	0.02
Mammal	1	+			+			+	1812.87	0.00	0.29
Mammal	2	+		+		+		+	1813.39	0.51	0.22
Mammal	3	+		+	+	+		+	1814.46	1.58	0.13
Mollusc	1	+						+	2629.47	0.00	0.09
Mollusc	2	+				+		+	2630.14	0.67	0.06
Mollusc	3	+						+	2630.27	0.80	0.06
Mollusc	4	+		+				+	2630.31	0.84	0.06
Mollusc	5	+				+		+	2630.70	1.23	0.05
Mollusc	6	+						+	2630.88	1.41	0.04
Mollusc	7	+		+		+			2631.02	1.54	0.04
Mollusc	8	+						+	2631.36	1.89	0.03
Reptile	1	+			+			+	2343.39	0.00	0.22
Reptile	2	+			+			+	2344.82	1.43	0.11
Reptile	3	+			+	+		+	2345.21	1.82	0.09
Reptile	4	+			+			+	2345.34	1.95	0.08

755

756 *Table S5.*

757 Model comparison regarding whether participants in our survey had experience with each  
758 taxonomic group. Several possible predictor variables were tested (see main text for details). “+”  
759 represents that the predictor variable was included in in models shown. *AICc* and *W* stand for  
760 models’ Akaike information criterion for small sample sizes and their weight, respectively. Only  
761 selected models (i.e.  $\Delta AICc < 2$ ) are shown.

Taxon	Rank	Predictor variables							<i>AICc</i>	$\Delta AICc$	<i>W</i>
		Fondness	Number of taxonomic groups experienced	Age	Gender	Editorial experience	Preference for fieldwork	Motivation from taxa			
Amphibian	1	+	+	+				+	504.54	0.00	0.28
Amphibian	2	+	+	+		+		+	506.13	1.59	0.12
Amphibian	3	+	+					+	506.37	1.83	0.11
Amphibian	4	+	+	+				+	506.43	1.89	0.11
Arachnid	1	+	+	+	+			+	463.99	0.00	0.17
Arachnid	2	+	+	+				+	464.48	0.49	0.13
Arachnid	3	+	+	+	+	+		+	464.81	0.82	0.11
Arachnid	4	+	+			+		+	464.99	1.00	0.10
Arachnid	5	+	+		+	+		+	465.30	1.31	0.09
Arachnid	6	+	+	+		+		+	465.39	1.40	0.08
Arachnid	7	+	+					+	465.56	1.58	0.08
Bird	1	+	+	+		+		+	969.83	0.00	0.28
Bird	2	+	+			+		+	970.79	0.97	0.17
Bird	3	+	+	+		+		+	971.43	1.60	0.13
Crustacean	1	+	+			+		+	385.54	0.00	0.19
Crustacean	2	+	+					+	386.71	1.17	0.11
Crustacean	3	+	+			+		+	387.00	1.47	0.09
Crustacean	4	+	+	+		+		+	387.39	1.86	0.08
Fish	1	+	+	+				+	732.05	0.00	0.15
Fish	2	+	+	+	+			+	732.49	0.44	0.12
Fish	3	+	+	+		+		+	732.79	0.73	0.10
Fish	4	+	+		+	+		+	732.8	0.74	0.10
Fish	5	+	+	+	+	+		+	733.27	1.21	0.08
Fish	6	+	+			+		+	733.52	1.47	0.07
Fish	7	+	+		+			+	733.64	1.59	0.07
Fish	8	+	+	+				+	733.94	1.88	0.06
Insect	1	+	+					+	868.92	0.00	0.19
Insect	2	+	+					+	869.39	0.47	0.15
Insect	3	+	+	+				+	869.64	0.72	0.13
Insect	4	+	+			+		+	870.03	1.12	0.11
Insect	5	+	+	+				+	870.28	1.37	0.09
Insect	6	+	+			+		+	870.56	1.64	0.08

Mammal	1	+	+	+	+			1057.46	0.00	0.2
Mammal	2	+	+	+				1058.16	0.7	0.14
Mammal	3	+	+	+	+			1058.31	0.85	0.13
Mammal	4	+	+	+	+	+		1058.61	1.15	0.11
Mammal	5	+	+	+			+	1058.76	1.3	0.1
Mammal	6	+	+	+		+		1059.36	1.90	0.08
Mollusc	1	+	+				+	318.33	0.00	0.12
Mollusc	2	+	+	+		+	+	318.68	0.36	0.10
Mollusc	3	+	+			+	+	318.74	0.41	0.10
Mollusc	4	+	+	+			+	319.48	1.16	0.07
Mollusc	5	+	+					319.68	1.35	0.06
Mollusc	6	+	+				+	319.81	1.48	0.06
Mollusc	7	+	+	+		+		320.06	1.73	0.05
Mollusc	8	+	+			+		320.10	1.77	0.05
Reptile	1	+	+					607.85	0.00	0.14
Reptile	2	+	+				+	608.20	0.35	0.12
Reptile	3	+	+			+		609.31	1.46	0.07
Reptile	4	+	+				+	609.31	1.46	0.07
Reptile	5	+	+			+	+	609.75	1.90	0.06
Other invertebrate	1		+				+	314.41	0.00	0.21
Other invertebrate	2		+			+	+	314.65	0.23	0.19
Other invertebrate	3		+	+			+	316.20	1.79	0.09
Other invertebrate	4		+				+	316.37	1.96	0.08
Other organism	1		+					211.88	0.00	0.13
Other organism	2		+	+				212.14	0.25	0.11
Other organism	3		+		+			212.76	0.88	0.08
Other organism	4		+	+	+			213.75	1.87	0.05
Other organism	5		+				+	213.77	1.89	0.05
Other organism	6		+			+		213.79	1.91	0.05
Other organism	7		+				+	213.82	1.93	0.05

762

763 *Table S6.*

764 Model comparison regarding whether the species mentioned by participants in our survey were  
765 suggested by a supervisor (*vs.* other people or themselves). Two possible predictor variables were  
766 tested (see main text for details). “+” represents that the predictor variable was included in models  
767 shown. *AICc* and *W* stand for models’ Akaike information criterion for small sample sizes and  
768 their weight, respectively.

Rank	Predictor variables		<i>AICc</i>	$\Delta AICc$	<i>W</i>
	Period	Version			
1	+		1871.87	0.00	0.61
2	+	+	1872.73	0.86	0.39
3		+	2013.53	141.66	0.00
4			2042.80	170.93	0.00

769

770 *Table S7.*

771 Model comparison regarding five statements (response variables) about the easiness to work with  
 772 the most recent species experienced by participants in our survey. “+” represents that the predictor  
 773 variable was included in models shown. *AICc* and *W* stand for models’ Akaike information  
 774 criterion for small sample sizes and their weight, respectively.

Response variable	Rank	Predictor variables		<i>AICc</i>	$\Delta AICc$	<i>W</i>
		Genus mentions	Preference for fieldwork			
Easy to buy	1	+	+	2182.53	0.00	1.00
Easy to buy	2		+	2193.97	11.43	0.00
Easy to buy	3	+		2219.78	37.25	0.00
Easy to buy	4			2234.16	51.63	0.00
Easy to find in the field	1		+	3112.52	0.00	0.70
Easy to find in the field	2	+	+	3114.45	1.92	0.27
Easy to find in the field	3			3119.07	6.55	0.03
Easy to find in the field	4	+		3120.6	8.08	0.01
Easy to observe in the field	1	+	+	3139.08	0.00	0.93
Easy to observe in the field	2	+		3144.53	5.44	0.06
Easy to observe in the field	3		+	3148.09	9.00	0.01
Easy to observe in the field	4			3151.57	12.49	0.00
Easy to observe in the lab	1	+	+	2631.58	0.00	1.00
Easy to observe in the lab	2	+		2674.9	43.32	0.00
Easy to observe in the lab	3		+	2675.63	44.05	0.00
Easy to observe in the lab	4			2721.03	89.45	0.00
Easy to rear in the lab	1	+	+	2675.73	0.00	1.00
Easy to rear in the lab	2	+		2709.14	33.41	0.00
Easy to rear in the lab	3		+	2717.62	41.89	0.00

775

776 *Table S8.*

777 Coefficients from models selected regarding five statements (response variables) about the  
 778 easiness to work with the most recent species experienced by participants in our survey (see also  
 779 Table S7).

Response variable	Predictor variable	Coefficient	SE	z-score	p-value
Easy to buy	Genus mentions	0.45	0.07	6.02	<0.001
Easy to buy	Preference for fieldwork	-0.35	0.10	-3.68	<0.001
Easy to find in the field	Genus mentions	0.14	0.05	2.90	<0.001
Easy to observe in the field	Genus mentions	0.11	0.04	2.68	0.01
Easy to observe in the field	Preference for fieldwork	0.24	0.07	3.33	<0.001
Easy to observe in the lab	Genus mentions	0.39	0.06	6.64	<0.001
Easy to observe in the lab	Preference for fieldwork	-0.58	0.09	-6.76	<0.001

Easy to rear in the lab	Genus mentions	0.35	0.06	5.92	<0.001
Easy to rear in the lab	Preference for fieldwork	-0.57	0.09	-6.63	<0.001

780

781

782 *Table S9.*

783 Journals specialised in ethology and/or behavioural ecology (i.e. behaviour journals) or general

784 ecology and evolution (i.e. E&E journals) used in our study to retrieve researchers' emails. ISSN

785 stands for International Standard Serial Number.

Set	Journal	Publisher	Supporting society or institution	ISSN(s)
Behaviour	Acta Ethologica	Springer Nature	Portuguese Ethological Society	0873-9749, 1437-9546
	Animal Behaviour	Elsevier	Association for the Study of Animal Behaviour, Animal Behavior Society	1095-8282, 0003-3472
	Animal Cognition	Springer Nature	-	1435-9448, 1435-9456
	Behavioral Ecology	Oxford University Press	International Society for Behavioral Ecology	1045-2249, 1465-7279
	Behavioral Ecology and Sociobiology	Springer Nature	-	0340-5443, 1432-0762
	Behaviour	Brill	-	0005-7959, 1568-539X
	Behavioural Processes	Elsevier	-	0376-6357, 1872-8308
	Ethology	Wiley	Ethological Society	0179-1613, 1439-0310
	Ethology Ecology and Evolution	Taylor & Francis	-	0394-9370, 1120-6705, 1828-7131,
	Journal of Comparative Psychology	American Psychological Association	-	0735-7036, 1939-2087
	Journal of Ethology	Springer Nature	Japan Ethological Society	0289-0771, 1439-5444
	E&E	BMC Ecology and Evolution	BMC	-
Current Zoology		Oxford University Press	China Zoological Society	1674-5507, 2396-9814
Ecology and Evolution		Wiley	British Ecological Society	2045-7758
Ecology Letters		Wiley	Centre National de la Recherche Scientifique	1461-023X, 1461-0248
Evolution		Oxford University Press	Society for the Study of Evolution	0014-3820, 1558-5646
Evolution Letters		Oxford University Press	Society for the Study of Evolution	2056-3744

Functional Ecology	Wiley	British Ecological Society	0269-8463, 1365-2435
Journal of Animal Ecology	Wiley	British Ecological Society	0021-8790, 1365-2656
Journal of Evolutionary Biology	Oxford University Press	European Society for Evolutionary Biology	1010-061X, 1420-9101
Nature Ecology and Evolution	Springer Nature	-	2397-334X
The American Naturalist	The University of Chicago Press	American Society of Naturalists	0003-0147, 1537-5323

786

787

788 **Appendix 1 - Survey**

789

790 [Participant Information Sheet and Consent was applied before the survey]

791

792 *PART 1: Eligibility*

793

794 1. **Have you ever directly collected behavioural data from non-human organisms that**  
795 **led to at least one research output\* of which you were an author?**

796 \*Research outputs include conference posters or presentations, preprints, peer-reviewed  
797 publications, dissertations, theses, or books.

798  Yes [proceed]

799  No [terminate the survey]

800

801 *PART 2: Demographics*

802

803 2. **How old are you?**   [fill]  

804

805 3. **How do you identify?**

806  Agender

807  Gender fluid

808  Man

809  Non binary

810  Woman

811   ○     Other (please specify)   [fill]  

812

813   **4. In which country have you spent most of your life UNTIL you were 18 years old? (please**  
814 **elect only one country if multiple countries apply)**

815     [fill]  

816

817   **5. In which country have you spent most of your life AFTER turning 18 years old? (please**  
818 **elect only one country if multiple countries apply)**

819     [fill]  

820

821   **6. What is your current highest level of education? (i.e. obtained degree; do NOT consider**  
822 **current studies)**

823   ○ High school/Technical school

824   ○ Undergraduate/Honours degree

825   ○ MSc/Master's degree

826   ○ PhD/Doctoral degree

827

828   **7. [if Q6 is PhD/Doctoral degree] In what year did you complete your PhD?**

829     [fill]  

830

831   *PART 3: General preferences and experiences*

832

833 **8. Are you or have you ever been an editor of any scientific journals that at least occasionally**  
834 **publish ethological or behavioural research?**

835 o Yes

836 o No

837

838 **9. Based purely on personal enjoyment, how would you split your time collecting**  
839 **behavioural data between the field and the lab?**

840 o 100% in the field, 0% in the lab

841 o 90% in the field, 10% in the lab

842 o 80% in the field, 20% in the lab

843 o 70% in the field, 30% in the lab

844 o 60% in the field, 40% in the lab

845 o 50% in the field, 50% in the lab

846 o 40% in the field, 60% in the lab

847 o 30% in the field, 70% in the lab

848 o 20% in the field, 80% in the lab

849 o 10% in the field, 90% in the lab

850 o 0% in the field, 100% in the lab

851

852 **10. How much does your desire to work with certain taxonomic groups drive your**  
853 **behavioural research interests compared with other possible motivations (e.g. exploration of**  
854 **specific topics pertinent to most organisms, professional prospects, etc)?**

855 o 100% driven by certain taxonomic group(s), 0% driven by other motivations

- 856 o 90% driven by certain taxonomic group(s), 10% driven by other motivations
- 857 o 80% driven by certain taxonomic group(s), 20% driven by other motivations
- 858 o 70% driven by certain taxonomic group(s), 30% driven by other motivations
- 859 o 60% driven by certain taxonomic group(s), 40% driven by other motivations
- 860 o 50% driven by certain taxonomic group(s), 50% driven by other motivations
- 861 o 40% driven by certain taxonomic group(s), 60% driven by other motivations
- 862 o 30% driven by certain taxonomic group(s), 70% driven by other motivations
- 863 o 20% driven by certain taxonomic group(s), 80% driven by other motivations
- 864 o 10% driven by certain taxonomic group(s), 90% driven by other motivations
- 865 o 0% driven by certain taxonomic group(s), 100% driven by other motivations

866

867 **11. How would you rate your feelings towards the following animals on a spectrum ranging**  
 868 **from negative (e.g., anxiety, disgust, fear) to positive (e.g., admiration, cuteness, fascination),**  
 869 **with ambivalent feelings in between?**

<b>Taxonomic group</b>	<b>Extremely negative</b>	<b>Moderately negative</b>	<b>Slightly negative</b>	<b>Neither positive nor negative</b>	<b>Slightly positive</b>	<b>Moderately positive</b>	<b>Extremely positive</b>
Amphibians							
Arachnids							
Birds							
Crustaceans							
Fish							
Insects							
Mammals							
Molluscs							
Reptiles							

870

871 **12. From how many different non-human organisms (at the species level) have you**  
872 **directly collected behavioural data that led to at least one research output\* for which you**  
873 **were an author?**

874 \*Research outputs include conference posters or presentations, preprints, peer-reviewed  
875 publications, dissertations, theses, or books.

876   [fill]  

877

878 **13. Select all taxonomic groups from which you directly collected behavioural data that**  
879 **led to at least one research output\* of which you were an author.**

880 \*Research outputs include conference posters or presentations, preprints, peer-reviewed  
881 publications, dissertations, theses, or books.

882     ▪ Amphibian

883     ▪ Arachnid

884     ▪ Bird

885     ▪ Crustacean

886     ▪ Fish

887     ▪ Insect

888     ▪ Invertebrate not on this list

889     ▪ Mammal

890     ▪ Mollusc

891     ▪ Non-animal organism

892     ▪ Reptile

893

894 *PART 4: Experiences and opinions regarding specific studied organisms*

895

896 If q12 answer is equal or greater than 2, some of the following questions (q15-18 and q27-28) will  
897 be asked twice. However, repeated questions will be related to the species that the participant  
898 worked with least recently (see q14).

899

900 **14. Specify the scientific name (genus and epithet, e.g. *Homo sapiens*) of the [most/least]**  
901 **recent non-human species from which you directly collected behavioural data that led to at**  
902 **least one research output\* of which you were an author (elect one species if multiple apply).**

903 \*Research outputs include conference posters or presentations, preprints, peer-reviewed  
904 publications, dissertations, theses, or books.

905

906   [fill]

907

908 **15. [q14 answer] is a/an**

909  Amphibian

910  Arachnid

911  Bird

912  Crustacean

913  Fish

914  Insect

915  Invertebrate not on this list

916  Mammal

917 o Mollusc

918 o Non-animal organism

919 o Reptile

920

921 **16. Approximately how many peer-reviewed articles have you published involving**  
922 **behavioural data that you directly collected from [q14 answer]?**

923 o 0

924 o 1

925 o 2

926 o 3

927 o 4 or more

928

929 **17. When did you first directly collect behavioural data from [q14 answer]?**

930 o During or before my PhD

931 o After my PhD, but not while holding a permanent research position (e.g.  
932 unemployed, postdoc)

933 o After my PhD, while holding a permanent research position (e.g. lecturer, professor)

934

935 **18. Which of these situations best describes how you INITIALLY decided to work with**  
936 **[q14 answer]?**

937 o My employer, supervisor, or collaborator used this species for research and/or suggested  
938 me to use this species in my research

939 ○ Someone, but NOT my employer, supervisor, or collaborator, showed or told me about  
940 this species and/or suggested that I used it in my research

941 ○ I had the idea to use this species in my research before anyone else directly suggested it  
942 or influenced me to do it

943

944 Questions below are answered in a 7-point Likert scale (i.e. strongly disagree to strongly agree):

945

946 **19. Reaching the place where [q14 answer] individuals are expected to be, and then locating**  
947 **or attracting them in the field is easy/accessible.**

948

949 **20. Once [q14 answer] individuals are located or attracted, observing or recording their**  
950 **behaviours in the field is easy/accessible.**

951 **21. Obtaining [q14 answer] individuals from suppliers (e.g. other research teams, farms,**  
952 **fisheries, pet stores) is easy/accessible.**

953

954 **22. Rearing and maintaining [q14 answer] individuals in the lab is easy/accessible.**

955

956 **23. Observing or recording [q14 answer] individuals in the lab is easy/accessible.**

957

958 **24. [q14 answer] is considered a model organism by the scientific community.**

959

960 **25. The behavioural literature on [q14 answer] is extensive.**

961

962 26. [q14 answer] possesses a specific characteristic that makes it an ideal species to  
963 answer a question I am or was interested in.

964

965 27. I already had the hobby of going out specifically to search for or look at [q15 answer]s  
966 before I started working with [q14 answer].

967

968 28. My interest for [q15 answer]s increased after working with [q14 answer].

969

970 29. [q14 answer] is an economically important species (e.g. used commercially, provides  
971 ecological services, considered a pest or a disease vector).

972

973 30. [q14 answer] is endangered/threatened in the wild.

974

975 31. The behavioural research I have conducted with [q14 answer] can be considered  
976 applied (e.g. pest control, conservation).

977

978 32. Please select the option “agree”. [attention question]

979 **Appendix 2 - Additional discussion**

980 Contradictory results we found, such that preference for fieldwork was positively related  
981 to fondness for arachnids but negatively related to the likelihood of working with them, may  
982 indicate that researchers are unaware that they can use neglected taxa to pursue their preferences  
983 (e.g. work with arachnids in the field), indicating that a diverse taxonomic education is key to  
984 addressing taxonomic bias in ecology and evolution. At finer taxonomic levels, participants with  
985 a stronger preference for fieldwork were more likely to report that the species they most recently  
986 worked with is easy to observe in the field, but harder to work with in the laboratory. This suggests  
987 that researchers select specific organisms to match their professional preferences also within a  
988 taxonomic group.

989 Justifying the choice of study species has become a staple in research manuscripts<sup>75</sup>, which  
990 may explain why most surveyed researchers agreed that the species they most recently worked  
991 with possesses a specific characteristic that makes it ideal to explore a certain topic. However, it  
992 is possible that other species could be equally useful for addressing the same questions, as similar  
993 traits often occur across diverse taxa, including (apparently) unique characteristics. For example,  
994 biologists would intuitively use mammals to understand the evolution of milk-like secretions as a  
995 form of parental care<sup>76</sup>, but species of other taxonomic groups can also express this behaviour (e.g.  
996 cecilians<sup>77</sup>; cockroaches<sup>78</sup>; spiders<sup>79</sup>). We thus argue that we could discover more species with  
997 astonishing features by exploring the existent biodiversity, which would grant us new ideal  
998 organisms to study, instead of simply marketing a few species as ideal for a topic (especially those  
999 that have been investigated for decades by several people).

1000 We also investigated the relationship between age and gender on researchers' taxonomic  
1001 preferences and experiences, even though we had no hypotheses on how these variables relate to

1002 taxonomic bias. We found that, on average, older participants in our survey worked with more  
1003 species and taxonomic groups than their younger counterparts, which may simply reflect that they  
1004 had more time to do so. However, it is also possible that researchers have been recently using  
1005 fewer taxa in their research, making their experiences less taxonomically diverse compared with  
1006 researchers in previous decades. We also observed that increasing age was related to greater  
1007 fondness for birds, lower fondness for amphibians, and greater likelihood of having worked with  
1008 mammals, which might show that distinct generations of researchers have different perspectives.  
1009 Women that participated in our survey worked with fewer species and taxonomic groups than men,  
1010 possibly reflecting the difficulties women face in academia<sup>80,81</sup> if these obstacles limit their  
1011 opportunities for taxonomic diversification. Although the literature suggests that women are more  
1012 likely to have animal phobias than men<sup>82</sup>, we found no gender differences in the perception of  
1013 different taxonomic groups, except for mammals, which women viewed more favourably than men  
1014 (Fig. 3A).

1015         In our survey, we also verified the relationship between participants' editorial experience  
1016 and their taxonomic focus. Given that editors are the main gatekeepers in the publishing system,  
1017 they have more power than other individuals to change patterns of taxonomic bias in the literature.  
1018 Participants with editorial experience worked with more species but not with more taxonomic  
1019 groups than other participants (Fig. 2), showing that these individuals are not specifically selected  
1020 because of the diversity of their experiences at a high taxonomic level. Despite participants with  
1021 editorial experience having a more favourable perception of some animal groups (crustaceans,  
1022 fish, molluscs) than others, they were more likely to work with birds than their counterparts. If  
1023 editors are more likely to accept research manuscripts that match their personal experiences for  
1024 publication, then taxonomic bias in the literature can worsen. This is certainly possible as biases

1025 in the publication process within ecology and evolution have been documented<sup>83,84</sup>, highlighting  
1026 the need for greater transparency in editorial decisions to assess whether individual preferences  
1027 and experiences influence publication patterns.