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1 Influence of living in a multi-cat household on health and behaviour in a cohort of cats from  
2 the United Kingdom

3

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13

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15 Word count: 3171

16 **Abstract**

17 Background

18 Living in a multi-cat household has been implicated as a risk factor for various feline issues,  
19 but evidence is often anecdotal or based on retrospective studies.

20

21 Methods

22 Data from the Bristol Cats Study, a UK longitudinal study of pet cats, were used. Cats were  
23 included if they had remained in either a single or multi-cat household between  
24 questionnaires one (two to four-month-old) and five (two-and-a-half-year-old). Univariable  
25 and multivariable logistic regression models were used to analyse associations between  
26 single/multi-cat households and measures of health and behaviour (overweight/obesity,  
27 abscesses/cat bites, negative interactions with owner, periuria). Multi-cat households were  
28 also subcategorised according to whether owners had reported agonistic behaviour between  
29 household cats.

30

31 Results

32 There was no evidence of association between household type and the likelihood of obesity,  
33 abscesses or periuria. The likelihood of negative interactions with the owner (for example  
34 growling or hissing) was influenced by the cats' relationships; cats in non-agonistic multi-cat  
35 households had decreased odds of negative interactions with the owner, compared to single  
36 and agonistic multi-cat households ( $P < 0.001$ ).

37

38 Conclusion

39 Living in a multi-cat households *per se* was not a risk factor for the health and behaviour  
40 issues investigated, but the inter-cat relationship is important.

## 41 **Introduction**

42 The problems and benefits afforded by multi-cat households can be a contentious issue, with  
43 strong views expressed regarding the welfare of cats housed with other cats. Although multi-  
44 cat households can be an enforced abnormal social structure, the influence of domestication  
45 and the ability of cats to adapt should be considered, and information based on evidence  
46 rather than anecdotes and preconceptions. Although traditionally regarded as an asocial  
47 species<sup>1</sup>, cats are able to form stable colonies around resources, as seen in populations of feral  
48 and farm cats<sup>2,3</sup>. Nearly half of pet cats in the UK live with other cats; estimates of the  
49 proportion of pet cats residing in a multi-cat household in the UK are around 42 to 43 per  
50 cent<sup>4,5</sup> of an estimated population of between 9 and 11 million<sup>5,6</sup>. If living in a multi-cat  
51 household is a risk factor for stress, disease and/or behavioural problems, this would apply to  
52 around four million cats in the UK.

53

54 Various health issues have been scientifically and anecdotally associated with living in a  
55 multi-cat household. For example, obesity is one of the most frequent health issues in cats<sup>7</sup>.  
56 This could be associated with multi-cat households where it is more difficult to control food  
57 intake, although results from a cross-sectional study found no evidence that this was the  
58 case<sup>8</sup>. Cat bite injuries and resulting abscesses are another frequent health issue<sup>7</sup>, and fighting  
59 can lead to the transmission of some infectious diseases. To our knowledge no studies have  
60 investigated association between abscesses/cat bites and multi-cat households, although bite  
61 wounds from inter-cat fighting were proposed as a reason for an association between multi-  
62 cat households and pyothorax<sup>9</sup>.

63

64 Multi-cat households could also be associated with unwanted behaviours. A reported 38% of  
65 returns and 7% of relinquishments of cats to rehoming shelters within a UK sample were as a

66 result of unwanted behaviours, with house-soiling and aggression towards people two of the  
67 main issues<sup>10</sup>. These are also both common reasons for behavioural referral in the UK<sup>11</sup>.  
68 House-soiling includes periuria; although this can be an indicator of feline lower urinary tract  
69 disease<sup>12</sup>, there is evidence that stressful events can lead to an increase in this behaviour<sup>13</sup> and  
70 it has been reported to occur more commonly in multi-cat households<sup>14</sup>. There also appears to  
71 be an increased risk of lower urinary tract signs where there is conflict between the cats<sup>15</sup> and  
72 relationships between cats in the household should therefore be considered. Conversely, the  
73 other behavioural issue, aggression towards people, has been linked with living in a single cat  
74 household, where it was most commonly directed towards the owner<sup>16</sup>.

75

76 Many of these studies on associations between health/behaviour and multi-cat households,  
77 have been retrospective<sup>14,15,17</sup> and/or cross-sectional<sup>8,18</sup>. Longitudinal studies have some  
78 distinct advantages, including the use of prospective data which are less susceptible to recall  
79 bias than retrospectively collected data<sup>19</sup>. Using owner-reported rather than veterinary-  
80 reported data allows the inclusion of cats who may have had, for example, an abscess, but did  
81 not visit a veterinary practice. Additionally, many studies on behaviour use a cohort of cats  
82 selected from a behaviour referral centre<sup>14,15,17</sup>. Inclusion of cats who have not visited a  
83 veterinary surgery or been referred is likely to be more representative of the whole UK pet cat  
84 population.

85

86 The objective of this study was to use prospectively-collected data from a longitudinal study  
87 to identify evidence of associations between multi-cat households and potentially associated  
88 health and behaviour issues (overweight/obesity, abscesses/cat bites, negative interactions  
89 with owner, periuria). A distinction between multi-cat households where cats had reported  
90 conflict and no reported conflict was also made.

91

## 92 **Materials and methods**

### 93 *Data collection*

94 The Bristol Cats Study (BCS) is an ongoing longitudinal study of health, behaviour and  
95 environment of pet cats in the UK. Owners of pet kittens between two and four months of age  
96 were recruited between May 2010 and December 2013. Recruitment was initially restricted to  
97 the Bristol area and expanded nationwide in 2011. Recruits were self-selected through  
98 advertisements placed in locations including veterinary practices, rehoming centres and cat  
99 interest websites. Owners could register multiple cats from the same household. The BCS has  
100 been described in more detail elsewhere<sup>20</sup>.

101

102 The BCS is primarily based on owner-completed questionnaires at specific ages of the  
103 registered cat(s). For this study, questionnaire one (Q1: age two to four months), two (Q2:  
104 age six months), three (Q3: age 12 months), four (Q4: age 18 months) and five (Q5: age two-  
105 and-a-half years) were used. These can be accessed at:

106 <https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-1-kitten-aged-8-16-wks-2>  
107 (Q1), [https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-2-6-month-old-](https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-2-6-month-old-cats-c)  
108 [cats-c](https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-2-6-month-old-cats-c) (Q2), [https://smvsfa.onlinesurveys.ac.uk/bristol-cats-](https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-3-12-month-old-cats-c)  
109 [study-questionnaire-3-12-month-](https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-3-12-month-old-cats-c)  
110 [old-cats-c](https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-3-12-month-old-cats-c) (Q3), <https://smvsfa.onlinesurveys.ac.uk/q4bc> (Q4) and  
111 <https://smvsfa.onlinesurveys.ac.uk/bristol-cats-study-questionnaire-5-25-years-old-cats-2>  
112 (Q5).

112

### 113 *Participants*

114 Cats from the BCS were included in this study if their owners had completed Q1 through Q5  
115 inclusive. Only cats who had remained either in a multi-cat (defined as two or more cats) or

116 a single cat household throughout the selected time period were included. Cats with  
117 incongruent data, that is where the owner reported interactions between household cats, but  
118 the household was classified as single cat household, or where the owner reported no cat-cat  
119 interactions within a multi-cat household, were excluded. Where more than one cat from the  
120 same household was eligible for the study, one was chosen at random for inclusion. Figure 1  
121 describes how the study sample was reached after removal of ineligible cats.

122

### 123 *Household*

124 Cats reported to have lived with no other cats in Q1 to Q5 inclusive were classed as living in  
125 single cat households. Cats reported to have lived with one or more other cats in Q1 to Q5  
126 were classified as living in multi-cat households. Owners were asked “which of these  
127 statements best describes how your Bristol Study cat interacts with other cats in the  
128 household”. Within multi-cat households, cats for whom the owner answered ‘yes’ to this  
129 question for one of the following behaviours: ‘hisses or spits at another cat’, ‘is hissed or spat  
130 at by another cat’, ‘is reluctant to pass another cat in a narrow space’ and/or ‘blocks or  
131 inhibits the movement of another cat’ were classed as agonistic multi-cat households. Multi-  
132 cat households where none of these behaviours were selected were classed as non-agonistic  
133 multi-cat households.

134

### 135 *Health and behaviour outcomes*

136 The outcomes were chosen to reflect common health and behaviour issues in pet cats  
137 anecdotally or scientifically associated with single or multi-cat households. They were also  
138 based on the data available for the Bristol Cats Study, having sufficient frequency within the  
139 population to allow statistical power.

140

141 *Overweight/obesity*

142 Cases were cats who were reported by their owner at Q5 to have been at body condition score  
143 four (overweight) or five (obese) within the past year, based on a five point scoring system<sup>21</sup>.

144 Controls were cats who were reported by their owners to have not been at body condition  
145 score four or five within the past year.

146

147 *Abscess/cat bite*

148 Cases were obtained from two questions in Q5; cats whose owner reported them to have  
149 visited a veterinary surgeon for an abscess or cat bite wound within the past 12 months, and  
150 those whose owners had reported that their cat had had an abscess or bite wound within the  
151 past 12 months but had not been presented to a veterinary surgeon. Control cats were those  
152 who were reported by their owner to have not had an abscess or bite wound within the past 12  
153 months.

154

155 *Periuria*

156 The frequency with which the owner reported that the cat urinated in the house but not in the  
157 litter tray was recorded in Q5 as 'always', 'usually', 'occasionally' and 'never'. Cats who  
158 'never' urinated in the house (excluding the litter tray) were classed as controls and cats  
159 whose owners had selected 'always', 'usually' or 'occasionally' were cases.

160

161 *Negative interactions with owners*

162 Owners were asked in Q5 how the cat responded (sometimes or always) when approached or  
163 handled 'nowadays', with a selection of answers. Those who had chosen one or more of the  
164 following statements were defined as cases: 'runs away', 'growls, hisses or spits', 'swipes at  
165 me'. Cats who had not shown any of these behaviours, but where the owner had selected one



166 or more of the other options were classified as controls.

167

168 Calculations indicated that based on the sample size for the four outcomes (at least 63 cases  
169 and 315 controls), at a significance level of 0.05 there was 80% power to detect an odds ratio  
170 of at least 2.5. Hence this study had the power to detect fairly large effect sizes only. (Epi  
171 Info 2000).

172

### 173 *Explanatory variables*

174 Potential explanatory variables for the four outcomes of interest were extracted from Q1 and  
175 Q5 (supplementary table 1). These were mostly variables that could be reasonably expected  
176 to cause stress (for example presence of children, neighbourhood cat density), along with  
177 demographics of the owners. Whether or not the cat was from the initial cohort (limited to  
178 the Bristol 'BS postcode' area) was included to address potential bias from this sampling  
179 method. Six factors had categories that were combined for analysis, based on the results of  
180 initial univariable analyses: income, education, playing time, time spent outdoors and cat  
181 density.

182

### 183 *Risk factor analysis*

184 Univariable logistic regression models were used to analyse associations between the four  
185 outcomes and single/multi-cat household status. Univariable analyses were then repeated  
186 with agonistic and non-agonistic multi-cat households as separate categories. The outcomes  
187 that showed an association with household status of  $P < 0.2$  were taken to further analysis.  
188 Outcomes with an association of  $P > 0.2$  with household were not analysed further, since  
189 household was the focus of interest.

190

191 Subsequent univariable analyses were run to identify other explanatory factors which were  
192 associated at  $P < 0.2$  for each outcome. These were then entered into the modelling process for  
193 multivariable analysis. For two variables (abscesses/cat bites and negative interactions with  
194 the owner) no unneutered cats were cases. One control cat for each of these variables was  
195 selected at random to become a case for these two univariable analyses to be conducted, then  
196 returned to controls for the other analyses. For each outcome, cats with missing data for any  
197 of the explanatory factors with  $P < 0.2$  were removed in order to have a complete dataset for  
198 each multivariable analysis.

199

200 For the multivariable analyses, the distinction between agonistic and non-agonistic multi-cat  
201 households was retained. Backward elimination was used in the multivariable model building  
202 process for each outcome; the explanatory factor with the highest  $P$  value greater than 0.05  
203 was removed at each stage until all remaining variables had  $P$  values less than 0.05.  
204 Interactions considered biologically plausible were tested for within each final multivariable  
205 model.

206

207 IBM SPSS Statistics version 23 was used for all data analyses. The Bristol Cats Study has  
208 ethical approval from the University of Bristol ethical committee (reference UIN/13/026).

209

## 210 **Results**

### 211 *Descriptive data*

212 The number of cats eligible for, and included in the study, is summarised in Figure 1. Of the  
213 cats included in the study, 21.3% were in single cat households and 78.7% in multi-cat  
214 households. Of the multi-cat households, the majority (62.2%) were in agonistic households,  
215 with 37.8% in non-agonistic households. The minimum number of cats in a multi-cat

216 household was two, with a maximum number of 30 (supplementary table 2). The median of  
217 cats in a multi-cat household was three cats and the interquartile range was two-five cats.  
218 About half (410/780: 52.4%) of the total number of cats were male and 182/776 (23.5%)  
219 were purebred cats. There were 22/783 (2.8%) cats (three male and 19 female) who were not  
220 neutered by age two-and-a-half years.

221

222 For overweight/obesity, 150/755 (19.9%) cats were reported by their owners at Q5 to be at  
223 body condition score four or five (on a 5-point scoring system) within the past 12 months.  
224 Sixty-eight of 783 (8.7%) cats had been reported by the owner to have had an abscess or cat  
225 bite within the past 12 months, whether or not they had been to a veterinary surgeon, and  
226 83/783 (10.6%) cats were reported to have urinated outside of the litter tray (with no  
227 specified timescale). Cats who were reported to have negative interactions with their owner  
228 numbered 132/782 (16.9%).

229

### 230 *Univariable analysis*

231 The results of the univariable analyses for association of the four outcomes with living in a  
232 single/multi-cat household are shown in table 1. No evidence of a significant association  
233 ( $P>0.2$ ) was found between living in a single vs multi-cat household and the odds of owner-  
234 reported overweight/obesity or periuria. Subsequently, no association was found when multi-  
235 cat households were split into agonistic or non-agonistic multi-cat households (supplementary  
236 table 3,4) These outcomes were therefore not assessed further.

237

238 Abscesses/cat bites and negative interactions with owner had P values less than 0.2 associated  
239 with single/multi-cat household (table 1). For both outcomes, a distinction was then made  
240 between agonistic and non-agonistic multi-cat households. The univariable analyses with

241 potential explanatory factors can be found in the supplementary material (supplement 5,6)  
242 These factors were taken forward to multivariable risk factor analysis, and the final  
243 multivariable models for each of the three outcomes are shown in table 2. As a result of  
244 different amounts of missing data for different questions, the total number of cats varies  
245 between outcomes.

246

### 247 *Multivariable analysis*

248 The final multivariable models can be seen in table 2.

249

#### 250 *Abscess/cat bite*

251 The complete dataset for abscesses/cat bites consisted of 465 cats, of which 53 (11.4%) were  
252 cases. Household status was not associated with owner-reported abscess/cat bite within the  
253 previous 12 months at multivariable level.

254

#### 255 *Negative interactions with owner*

256 For reported negative interactions with the owner, the complete dataset consisted of 656 cats  
257 of which 116 (17.7%) were cases. Agonistic multi-cat households were not significantly  
258 different from single cat households in the odds of the outcome, but non-agonistic multi-cat  
259 households had reduced odds of having a negative interaction with the owner when compared  
260 with single cat households (OR 0.26; 95% CI 0.14-0.50).

261

## 262 **Discussion**

263 This study aimed to use longitudinal prospectively collected data from the Bristol Cats

264 Study to analyse associations between single/multi-cat households and measures of health  
265 and behaviour, and to distinguish whether this differed for cats in agonistic and non-agonistic  
266 multi-cat households.

267

268 No evidence was found for an association between single/multi-cat households and owner-  
269 reported overweight/obesity or periuria in this sample of cats. Although the lack of an  
270 association within our dataset could be due to a lack of statistical power, our results  
271 do support previous findings for both outcomes<sup>8,17</sup>. Obesity is one of the most common health  
272 issues in cats<sup>7</sup> and a potential risk factor for numerous diseases<sup>22</sup>. Periuria is a common  
273 reason for relinquishment<sup>10</sup> and behavioural referral<sup>11</sup>. The finding that neither of these issues  
274 is associated with living in a multi-cat household is therefore important. Urination outside the  
275 litter tray has been used as an indicator of feline lower urinary tract disease<sup>12</sup>. Risk factors for  
276 other owner-reported lower urinary tract signs (haematuria, straining and vocalizing when  
277 urinating) have already been reported for the BCS cohort<sup>23</sup>, where living in multi-cat  
278 households was not found to put cats at greater risk. Inappropriate urination can also be a  
279 behavioural issue. Periuria as a behavioural issue could have confounding factors associated  
280 with the number of cats in a household for which data was not available, for example the  
281 location and number of litter trays within the household, although a behaviour-focussed  
282 retrospective study supports no association between single/multi-cat households and house  
283 soiling<sup>17</sup>.

284

285 Cat bites are another common health issue<sup>7</sup> and fighting is implicated in the spread of  
286 infectious disease. Living in a single cat household was associated at univariable level with  
287 having an abscess or cat bite within the past 12 months, indicating that abscesses and cat bites  
288 are more likely to be a result of an agonistic encounter with an unfamiliar cat rather than

289 between cats within a household. However, household was not retained in the final  
290 multivariable model. It may be that confounding factors existed which were not detected,  
291 resulting in removal from the final model.

292

293 The finding that negative interactions with the owner were associated with living in a single  
294 cat household supports a cross-sectional study where cats living without conspecifics had  
295 greater likelihood of aggression towards people<sup>16</sup>. In that study, the authors suggested play-  
296 related aggression as a potential reason for this finding, and this would be a likely explanation  
297 for the young cats in the present study. The distinction between agonistic and non-agonistic  
298 multi-cat households in the current study revealed that this association was only found in  
299 comparison with non-agonistic households. An explanation for this could be that inter-cat  
300 conflict in agonistic multi-cat households can lead to redirected aggression towards the  
301 owner<sup>24</sup>.

302

303 There are several implications for human-directed aggression. It is a common reason for  
304 relinquishment to rehoming centres; one study reports 14% of relinquishment in the UK were  
305 a result of this<sup>10</sup>. There are human health implications, such as cat bite infections and cat  
306 scratch fever. Finally, the human-cat relationship may be affected by negative interactions.  
307 Cats with whom their owners feel a weaker bond are less likely to receive preventative care<sup>25</sup>  
308 and owners with a weaker bond are less likely to feel emotional support from their pets<sup>26</sup>. The  
309 current study highlights the importance of establishing and maintaining good inter-cat  
310 relationships in multi-cat households and human-cat relationships in all households.

311

### 312 *Limitations*

313 The nature of the cohort, that is, motivated cat owners who are willing to complete annual

314 questionnaires, means that the results from the study are not necessarily representative of the  
315 general population of cat owners in the UK. One noticeable difference is the high percentage  
316 of cats in multi-cat households (79%), when compared with the general population of 42 to  
317 43 per cent<sup>4,5</sup>. However, this bias is considered more likely to affect prevalence estimates  
318 than risk factor analyses<sup>20</sup>. Additionally, one challenge of longitudinal studies is the retention  
319 of participants. Several retention strategies are implemented in the Bristol Cats Study, and  
320 have been described elsewhere<sup>20</sup>. Although the Bristol Cats Study is a reasonably large  
321 cohort, the occurrence of health and behaviour outcomes is often low, resulting in a lack of  
322 power to detect small but possibly clinically relevant effects. Indeed, limited statistical power  
323 within this study may have contributed to one or more of the non-significant findings, if they  
324 occurred as a result of a type-I error.

325

326 A final point is that the definition of an agonistic household was derived from the presence of  
327 agonistic behaviours, rather than the absence of affiliative behaviours. It is possible that some  
328 of the cats in households classed as agonistic by this definition may actually be in mostly  
329 harmonious relationships. This could also account for the high proportion of agonistic multi-  
330 cat households in the cohort. The relationships between cats within the Bristol Cats Study as  
331 well as the influence of number of cats within each household could be assessed more fully in  
332 future research.

333

### 334 *Conclusion*

335 Of the health and behaviour outcomes investigated, none were associated with living in a  
336 multi-cat household, despite a seemingly large proportion of agonistic multi-cat households.  
337 This suggests that cats may not necessarily be at increased risk of health and behavioural  
338 issues when living with other cats and should be taken into account when considering the

339 welfare of cats in multi-cat households. The likelihood of negative interactions with the  
340 owner was influenced by the cats' relationships, rather than the multi-cat household itself;  
341 veterinary practices and rehoming centres should promote methods of establishing and  
342 maintaining good inter-cat and cat-human relationships.

343

344

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348

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352

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410 **Table 1** Univariable regression for cats two-and-a-half years in from the Bristol Cats Study cohort  
 411 showing the association of single and multi-cat households with six health, behaviour and care  
 412 outcomes

| Outcome*  | N (%)<br>Cases          | N (%)<br>Controls        | P-value | OR (95% CI)              |
|---|-------------------------|--------------------------|---------|--------------------------|
| Overweight/obesity<br>Single cat<br>Multi-cat               | 28 (17.5)<br>122 (20.5) | 132 (82.5)<br>473 (79.5) | 0.398   | 1.0<br>0.82 (0.52-1.30)  |
| Abscess/cat bite<br>Single cat<br>Multi-cat                 | 22 (13.2)<br>46 (7.5)   | 145 (86.8)<br>570 (92.5) | 0.022   | 1.0<br>0.532 (0.31-0.91) |
| Periuria<br>Single cat<br>Multi-cat                         | 15 (10.8)<br>68 (13.8)  | 124 (89.2)<br>424 (86.2) | 0.352   | 1.0<br>1.33 (0.73-2.40)  |
| Negative interactions with owner<br>Single cat<br>Multi-cat | 40 (24.1)<br>92 (14.2)  | 126 (75.9)<br>524 (85.1) | 0.006   | 1.0<br>0.58 (0.38-0.88)  |

413 \*For definition of cases/controls, see materials and methods

414

415 **Table 2** Final multivariable logistic regression models for cats aged 2.5 years from the Bristol Cats  
 416 Study cohort showing factors associated with abscess/bite wounds, negative interactions with owner  
 417 and unvaccinated/lapsed vaccinations

| Variable                         | Factors               | N (%) cases | N (%)<br>controls | P-value               | OR (95% CI)           |
|----------------------------------|-----------------------|-------------|-------------------|-----------------------|-----------------------|
| Abscess/bite                     | Education             |             |                   |                       |                       |
|                                  | Up to A-level         | 7 (6.1)     | 108 (93.9)        | 0.034                 | 1<br>2.46 (1.07-5.64) |
|                                  | Degree and above      | 46 (13.1)   | 305 (86.9)        |                       |                       |
|                                  | Location              |             |                   |                       |                       |
| Town/city                        | 23 (8.4)              | 251 (91.6)  | 0.012             | 1<br>2.11 (1.18-3.78) |                       |
| Rural/village                    | 30 (15.7)             | 161 (84.3)  |                   |                       |                       |
| Negative interactions with owner | Household             |             |                   |                       |                       |
|                                  | SCH                   | 36 (25.9)   | 103 (74.1)        | <0.001                | 1                     |
|                                  | AMCH                  | 63 (20.1)   | 251 (79.9)        | 0.178                 | 0.72 (0.44-1.16)      |
|                                  | NMCH                  | 17 (8.4)    | 186 (91.6)        | <0.001                | 0.26 (0.14-0.50)      |
|                                  | Age of owner (years)* |             |                   |                       |                       |
|                                  | 55+                   | 13 (10.8)   | 107 (89.2)        | 0.024                 | 1<br>2.09 (1.10-3.96) |
|                                  | 16-54                 | 103 (19.2)  | 433 (80.8)        |                       |                       |
|                                  | Gender of cat         |             |                   |                       |                       |
|                                  | Male                  | 48 (13.5)   | 308 (86.5)        | 0.001                 | 1<br>2.11 (1.38-3.22) |
|                                  | Female                | 68 (22.7)   | 232 (77.3)        |                       |                       |
| Breed of cat                     |                       |             |                   |                       |                       |
| Pure breed                       | 12 (8.2)              | 135 (91.8)  | 0.005             | 1<br>2.53 (1.33-4.80) |                       |
| Mixed/DSH/DLH                    | 104 (20.4)            | 405 (79.6)  |                   |                       |                       |

418 \*For negative interactions with owner, there was no significant difference between age groups 16-24  
 419 and 25-54, so these were recoded into one category

420 SCH= single cat household; AMCH= agonistic multi-cat household, NMCH= non-agonistic multi-cat  
421 household; DLH= domestic longhair; DSH= domestic shorthair