Chicken Tumours and a Fishy Revenge: Evidence for Emotional Content Bias in the Cumulative Recall of Urban Legends

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1 **Chicken Tumours and a Fishy Revenge: Evidence for Emotional Content**

2 **Bias in the Cumulative Recall of Urban Legends**

3

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Abstract

21   This study used urban legends to examine the effects of a cognitive bias

22 for content which evokes higher levels of emotion on cumulative recall. As with

23 previous research into content biases, a linear transmission chain design was used.

24 One-hundred and twenty participants, aged 16-52, were asked to read and then

25 recall urban legends that provoked both high levels and low levels of emotion and

26 were both positively and negatively valenced. The product of this recall was

27 presented to the next participant in a chain of three generations. A significant

28 effect of emotion level on transmission fidelity was found with high emotion

29 legends being recalled with significantly greater accuracy than low emotion

30 legends. The emotional valence of a legend was found not to have any effect on

31 cumulative recall; thus emotional biases in recall go beyond disgust and can

32 incorporate other emotions such as amusement, interest and surprise. This study is

33 the first to examine an emotion bias in cultural transmission as a general

34 phenomenon without focusing on the emotion of disgust.

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Introduction

Recently researchers have convincingly argued that the ability to acquire and transmit knowledge through social learning has been a powerful selective force in the evolution of human cognition (Hermann, Call, Hernández-Lloreda, Hare, & Tomasello, 2007; van Schaik & Burkart, 2011; Richerson & Boyd, 2005). Reciprocally, it has been suggested that the ways in which information is processed and stored in the brain have a strong influence over the selection and modification of cultural traits that get passed on from person to person (Claidière & Sperber, 2007; Mesoudi & Whiten, 2008; Sperber, 1996). The positive influence of emotional arousal on the encoding and retrieval of memories in individual memory tests is well established (LaBar & Cabeza, 2006) but how this mnemonic advantage may translate to a content bias for emotional content in cultural transmission has received relatively little attention.

With regards to the effects of emotion on cultural transmission, previous research has focused on its influence on people's willingness to pass a story on (in Eriksson and Coultas' [2014] three phases of transmission, the stage defined by an individual's willingness to pass cultural information on is the 'choose-to-transmit' phase. The other two phases are 'choose-to-receive', based on an individual's willingness to receive cultural information and 'encode-and-retrieve', based on an individual's ability to encode the information to memory and later retrieve it). Heath, Bell and Sternberg (2001) propose that cultural items such as narratives undergo 'emotional selection', whereby concepts that trigger a stronger emotional response are positively selected for. To test this hypothesis they conducted two

66 studies using urban legends, focusing on the emotion of disgust. In their first

67 study Heath et al. (2001) asked participants to read urban legends and to rate them

68 for emotional, informational and story characteristics such as plot, characters,

69 morals, practical information and plausibility, as well as their willingness to pass

70 the story along to others. It was found that, while informational characteristics

71 such as plausibility, were important in the likelihood of passing on a legend,

72 legends were also more likely to be passed on if they elicited a greater level of

73 disgust. In a second study, when the number and level of disgust evoking motifs

74 in a legend were manipulated, participants preferred, and were more likely to pass

75 on, legends which produced the highest level of disgust despite the fact that these

76 stories were also less plausible and featured higher mean levels of other negative

77 emotions such as anger and sadness. Heath et al. (2001) also found that urban

78 legends which featured a greater number of disgust evoking motifs were more

79 widely distributed on urban legend websites. They argue that urban legends are

80 transmitted and retained in the social environment due to a positive selection for

81 narratives that evoke stronger levels of emotion in general.

82   Another study by Peters, Kashima and Clark (2009) examined the effect

83 of emotionality on the dissemination of social information. Participants were

84 asked to read anecdotes then complete a questionnaire on how likely they would

85 be to tell this anecdote to an unspecified audience, an audience of friends or an

86 audience of strangers. They found that anecdotes which evoked medium to high

87 levels of emotion were more likely to be passed on than anecdotes which evoked

88 lower levels of emotion. Participants were also significantly more willing to pass

89 on anecdotes which evoked interest, disgust and happiness than sadness, fear and

90 contempt to all three types of audience.

91   Other research suggests that it is the features of emotions rather than

92 individual emotions themselves which enhances transmission. Berger and

93 Milkman (2010) conducted an empirical analysis of 6,956 articles published over

94 three months on the *New York Times* website. When controlling for external

95 drivers of attention (position on the website etc.) and the emotions of surprise and

96 interest, they found that articles which aroused emotions characterised by high

97 arousal, such as anger, anxiety and awe were more likely to be forwarded via

98 email than articles which evoked emotions characterised by low arousal, such as

99 sadness. A survey of *New York Times* readers about their most recently shared

100 article supported this finding (Berger & Milkman, 2010). No relation was found

101 between disgust and how likely an article was to be shared but they suggest that

102 this result is likely to be due to few of the news articles eliciting this emotion.

103 Berger (2011) argues that this increased transmission is driven by the mobilising

104 effect of an excitatory state and found a similar effect even when the arousal was

105 incidental to the material being shared. Other studies have similarly found that

106 increased emotional arousal increases the amount of sharing of information by

107 participants (Christophe & Rimé, 1997; Luminet, Bouts, Delie & Manstead, 2000)

108 but have not looked at the specific emotions involved.

109   Cultural transmission, however, does not just rely on people's willingness

110 to pass a story on; in oral transmission at least, they must also encode and recall it.

111 The cumulative effects of recall will have a particular influence over cultural

112 transmission as only those elements which are preserved will be passed on to the

113 next generation. Eriksson and Coultas (2014) examined the role of cumulative

114 recall in transmission by expanding on Heath at al. (2001). They introduced the

115 concept of three distinct phases of cultural transmission: 'choose-to-receive',

116 'encode-and-retrieve' and 'choose-to-transmit'. In a number of experiments using

117 urban legends, they demonstrated that content evoking a high degree of disgust

118 had a transmission advantage over content evoking a lower degree of disgust in all

119 three phases. However, when looking at individual differences in willingness to

120 pass along stories they found that positively valenced emotions (amusement,

121 surprise) received higher ratings than negatively valenced emotions (anger,

122 sadness, fear, disgust), suggesting that other emotions, particularly positively

123 valenced ones, may be selected for to an even greater degree than disgust, at least

124 in the 'choose-to-transmit' phase. While this study did demonstrate an advantage

125 in cumulative recall for content which evoked higher levels of emotion (in their

126 'encode-and-retrieve' phase), like Heath et al (2001) it focused on the emotion of

127 disgust.

128 *The Present Research*

129 As in Heath et al. (2001) and Eriksson and Coultas (2014), real urban

130 legends were used as a means to investigate emotional content biases. The study

131 focused on urban legends because they represent culturally successful narratives

132 from the real world and are also practical for use in experiments because they are

133 relatively short and self-contained. Successful legends often share a number of

134 features, such as a suspenseful or humorous narrative, which contains surprising

135 information or a twist, a warning or moral message that is either explicit or

136   implied, and they are often attributed to a "friend of a friend" (Brunvand, 2000;

137   Fox Tree & Weldon, 2007).

138   In contrast to the studies by Heath et al. (2001) and Eriksson and Coultas

139   (2014), emotional content bias is investigated as a general phenomenon, rather

140   than focusing on the single emotion of disgust, and the effects of emotion level on

141   cumulative recall (the 'encode-and-retrieve' phase of transmission) are examined

142   rather than either just the 'choose-to-transmit' phase or all three phases of

143   transmission. Cumulative recall was chosen for examination as this can produce

144   different results from individual recall, for example studies examining stereotype

145   consistency bias have found that stereotype inconsistent (SI) information is

146   recalled better than stereotype consistency (SC) bias at the individual level

147   (Dijksterhuisand & van Knippenberg, 1995; Macrae, Hewstone, & Griffiths,

148   1993) but in cumulative recall stereotype consistent information is recalled better

149   (Allport & Postman, 1947; Bangerter, 2000). Kashima (2000) found that, when

150   remembering plot-relevant details, participants in earlier positions in a

151   transmission chain recalled SI information better than SC information, however,

152   SC information was retained better than SI information towards the end of the

153   chain.

154   A transmission chain design is used, in which some form of information is

155   passed from one participant to another in a linear 'chain' (as per the children's

156   game 'Chinese Whispers'/'Broken Telephone'). Transmission chain experiments

157   are uniquely effective in uncovering content biases in transmission (Mesoudi et al,

158   2006) and have been used successfully to investigate cognitive content biases,

159   such as minimally counter-intuitive (MCI) bias (Barrett & Nyhof, 2001), a

160 hierarchical bias (Mesoudi & Whiten, 2004), a stereotype consistency bias

161 (Kashima, 2000) and a social information bias (Mesoudi, Whiten & Dunbar,

162 2006) as well as multiple biases occurring together (Stubbersfield, Tehrani &

163 Flynn, 2015). In order to select appropriate material, seventeen urban legends

164 were selected from the *Urban Legends Reference Pages* (www.snopes.com). The

165 extent to which the legends evoked emotion was then rated by participants on a 7-

166 point scale. Four legends were selected, two which scored high for evoking

167 emotion and two which scored low. These legends evoked a range of emotions

168 including disgust and amusement. This experiment aimed to test the hypothesis

169 that emotional content bias is a general phenomenon and that legends that evoke

170 higher levels of emotion will be recalled with higher fidelity along a transmission

171 chain than legends that evoke lower levels of emotion, regardless of the emotion

172 evoked. Individual recall-based experiments have shown a recall advantage for

173 content which evokes high emotion across both positive and negative valences

174 (LaBar & Cabeza, 2006) while transmission-based experiments have found

175 differences between positive and negative valence in certain circumstances

176 (Eriksson & Coultas, 2014; Peters et al., 2009) so here the effect of valence of

177 cumulative recall is also examined.

178

179 **Methods**

180 *Participants*

181   One-hundred and twenty participants (94 females) took part. Their ages

182 ranged from 16 to 52 years with a mean age of 20.36 years (SD = 6.34). The

9

183 majority (92%) were undergraduate students studying psychology, education or

184 recruited through opportunity sampling. Others were prospective students and

185 parents attending a Psychology Department Open Day; all participants under the

186 age of 18 took part with their parents' consent.

187 *Design*

188   A linear transmission chain design was used. Each individual legend was

189 transmitted along ten chains of three participants or 'generations', totalling forty

190 chains for all four legends. Three generations was judged to be an optimum chain

191 length, capable of capturing long-term cumulative effects of cultural transmission

192 but short enough to be practical in terms of participant recruitment and has been

193 used successfully in previous research (Barrett & Nyhof, 2001; Nielsen,

194 Cucchiaro & Mohamedally, 2012; Stubbersfield et al., 2015). The first participant

195 in each chain received a selection of legends which were counterbalanced so no

196 legend appeared in the same position more than another legend. The next

197 participant was presented with the material that had been recalled by the previous

198 participant and so on, along the chain.

199 *Material*

200   Before conducting the transmission chain study it was necessary to select

201 appropriate legends. From a selection of seventeen original urban legends edited

202 to match for word count and number of central propositions, two high emotion

203 legends and two low emotion legends were selected. These legends are presented

204 below:

205

206   1. Steroids in chicken cause ovarian cysts (low emotion)

207   *A woman underwent an operation to remove an ovarian cyst but just a*

208   *few months later she relapsed and was rushed to her gynaecologist. The*

209   *gynaecologist asked her if she often ate chicken wings, when she said yes*

210   *he explained that, today, chickens are injected with steroids to accelerate*

211   *growth. These steroids can have a terrifying effect on the body and are*

212   *most dangerous in the presence of female hormones. Exposure to these*

213   *steroids can lead to women being more prone to the growth of cysts in her*

214   *womb.*

215   2. Woman has revenge on boyfriend with rotten fish in car (low emotion)

216   *A woman caught her boyfriend with another woman and decided to get*

217   *revenge. She cut open the passenger seat of his car and hid fish inside*

218   *before neatly re-stitching along the seam. As the fish rotted his car was*

219   *filled with a terrible smell that he couldn't get rid of no matter what he*

220   *did. He had no luck finding a new girlfriend because no woman would set*

221   *foot in his car. He finally gave up and sold the car at a huge loss because*

222   *of the horrible smell.*

223   3. Woman eats a tumour in a chicken burger (high emotion)

224   *A woman went into a takeaway and ordered a chicken burger but*

225   *asked for it without mayonnaise. After leaving the restaurant she bit into*

226   *the burger and discovered that there was mayonnaise in it after all, but*

227   *she finished the burger anyway. Later that evening, she checked herself*

228   *into the local hospital after falling violently ill with food poisoning. Her*

229   *stomach was pumped and the doctors discovered that the chicken in her*

230   *burger had contained a tumour and that the sauce wasn't mayonnaise, it*

231   *was pus from the tumour.*

232   4. Man suffers from flatulence at dinner party hosted by his girlfriend's

233   parents (high emotion)

234   *A man was having dinner with his girlfriend's parents when he was*

235   *suddenly gripped by terrible flatulence. He excused himself from the table*

236   *and went in search of a toilet, however, he couldn't find one in time so*

237   *instead he farted through an open window out of the parent's earshot.*

238   *Much relieved, he returned to the table and continued the meal. Later, he*

239   *asked his girlfriend how the night had gone, expecting a good response,*

240   *however, she replied "it was going fine until you farted through the*

241   *serving hatch!"*

242   Table 1 gives further detail about the legends used, such as their valence

243   and the emotions they were said to evoke by participants. The legend selection

244   was informed by questionnaire ratings from 106 participants on scales relevant to

245   potential content biases such emotion, plausibility, survival information, social

246   information and gender stereotyped behaviour. The ratings from this questionnaire

247   allow for comparisons to be made between the legends in terms of content which

248   may influence their recall and transmission. The high emotion legends were rated

249   as evoking higher levels of emotion than the low emotion legends. Of the

250   seventeen legends originally rated, Tumour-HN received the highest rating for

251 emotion and Dinner-HP was ranked 4th, Cyst-LN was ranked 12th and Fish-LP

252 was ranked 16th.

253   In order to ensure that level of emotion was driving any differences in

254 transmission of the legends, efforts were made to select legends that did not

255 significantly vary on measures of potentially confounding content biases such as

256 survival information, social information and gender stereotyped behaviour. The

257 selected legends were successfully matched across the measures in most cases but

258 there were some potentially confounding differences in content. Fish-LP and

259 Dinner-HP both differed from Cyst-LN and Tumour-HN in survival information,

260 social information and gender stereotypes but the effect of these differences were

261 taken into account (see supplementary material for the mean differences between

262 legends on these scores).

263   [Table 1 about here]

264 *Procedure*

265   Participants were asked to take part in a study regarding the cultural

266 transmission of urban legends. Participants were individually presented with the

267 experimental materials on a computer. They were asked to read the material and

268 then, on a new page, type what they remembered of this material. No distracter

269 task was performed and no time limit for recall was set. At no point during the

270 procedure were participants told that the material had come from a previous

271 participant or that their recall would be presented to another participant.

272 *Coding*

13

273   Following previous studies which used a linear transmission chain design

274   (Bangerter, 2000; Kashima, 2000; Mesoudi, et al., 2006; Mesoudi & Whiten,

275   2004; Stubbersfield et al, 2015), a propositional analysis (Kintsch, 1974) was

276   performed on each participant's recall. This involves dividing the text into

277   separate propositions. Only propositions central to the narrative were coded so as

278   to avoid legends with more background details appearing to have poorer recall, as

279   previous research has demonstrated that information relevant to the plot of a

280   narrative is better recalled than background details (Kashima, 1997). This

281   propositional analysis was used to calculate the percentage of original central

282   propositions correctly recalled. Percentages were used instead of total number as

283   the original texts varied between five and six central propositions. No significant

284   difference in the percentage of central propositions recalled was found between

285   legends with five central propositions and legends with six.

286   To assess coder reliability, an independent coder blind to the study

287   hypothesis coded two chains of each legend (20% of all material). There was a

288   significant correlation between the coding of the independent coder and the

289   original coder ($r_{24} = .88, p < .001$).

290   **Results**

291   A mixed 3x4 analysis of variance (ANOVA) was conducted with

292   generation as a within subjects variable and legend as a between groups variable.

293   There was a significant main effect of generation on the percentage of central

294   propositions recalled ($F_{2, 72} = 38.23, p < .001$). Planned contrasts revealed that

295   recall quantity was significantly higher in generation 1 than generation 2 ($F_{1, 36} =$

296   28.62, $p < .001$) and higher in generation 2 than generation 3 ($F_{1, 36} = 11.38$, $p <$

297   .005).

298   There was also a significant main effect of legend on the percentage of

299   propositions recalled ($F_{3, 36} = 22.87$, $p < .001$). A Games-Howell *post hoc* test

300   revealed that Tumour-HN and Dinner-HP both had significantly higher recall than

301   Fish-LP and Cyst-LN ($ps \leq .001$). No other significant results were found. Figure

302   1 shows the pattern of recall for each legend along the chains for each generation.

303   [Figure 1 about here]

304   A second mixed 3x2 ANOVA was conducted with generation as a within

305   subjects variable and degree of emotion evoked (high vs. low) as a between

306   groups variable. This revealed a significant main effect of generation as before

307   ($F_{2, 76} = 33.17$, $p < .001$). Legends which evoked a higher degree of emotion

308   showed a higher level of recall than legends which evoked a lower degree of

309   emotion ($F_{1, 38} = 56.97$, $p < .001$). A third mixed 3x2 ANOVA was conducted

310   with generation as a within subjects variable and emotional valence (positive vs.

311   negative) as a between groups variable but no significant main effect of emotional

312   valence was found ($F_{1, 38} = 1.12$, $p > .05$).

313   As some of the legends were not matched across potentially confounding

314   content biases it is important to test for any effects this content may have had on

315   recall. No significant correlations were found between the percentage of central

316   propositions recalled and the social information score (M = 3.84, SD = 1.67) or

317   the stereotype score (M = 3.73, SD = 1.15), both tests $p > .05$. However, a

318   significant negative correlation was found between the percentage of central

15

propositions recalled and the survival information score ($r = -.35$, n = 120, $p <$
.01). In order to test how much effect the survival information score had on the
percentage of central propositions recalled, a multiple regression was run to
predict percentage of central propositions recalled from emotion level and
survival information score. The regression model significantly predicted recall
($F_{2, 117} = 68.87$, $p < .01$, $R^2 = .54$, adjusted $R^2 = .53$). Emotion level received the
strongest weight in the model, explaining 41.6% of the unique variance compared
to the survival information score which only predicted 2.79% of the unique
variance. No significant age or gender effects were found.

Discussion

The results of this study show that the urban legends which evoked higher
levels of emotion in general were recalled with greater accuracy across a linear
transmission chain than urban legends which evoked lower levels of emotion.
This is consistent with previous research, which has demonstrated a cognitive bias
for content which evokes higher levels of emotion (Berger & Milkman, 2010;
Christophe & Rimé, 1997; Luminet, Bouts, Delie & Manstead, 2000).
Importantly, however the emotional valence of an urban legend, positive or
negative, was found to have no significant effect on cumulative recall. This is
consistent with individual recall experiments where emotional arousal was found
to enhance encoding and retrieval across both positive and negative valence
(LaBar & Cabeza, 2006). Previous studies have found that participants were more
willing to pass on stories which were positively valenced than negatively
valenced, with the possible exception of when it is negatively valenced due to
disgusting content (Eriksson & Coultas, 2014; Peters et al., 2009). The

343   transmission chain design presented here revealed that positive valence lends no

344   advantage in the encode-and-retrieve phase of transmission, perhaps explaining

345   why negatively valenced legends are so pervasive in the cultural environment.

346   Future research should examine the differing levels of arousal of specific

347   emotions in cultural transmission. If negatively valenced content is more likely to

348   arouse strong emotions it could have an advantage at the encode-and-retrieve

349   phase of transmission. Future research should also focus on the effects of positive

350   or negative valence in the chose-to-receive phase and focus on examining the

351   consumption of negatively valenced material.

352   Much of the existing research into emotional content bias in cultural

353   transmission has focused on disgust (e.g. Eriksson & Coutlas, 2014; Heath et al.,

354   2001; Nichols, 2002). For example, Nichols (2002) found that 16th century

355   etiquette norms which prohibited disgust evoking actions were more likely to

356   survive in the social environment than other etiquette norms. Similarly, Heath et

357   al. (2001) found that participants preferred, and were more likely to pass on,

358   legends which produced the highest level of disgust even though these stories

359   were also less plausible and featured higher mean levels of other negative

360   emotions such as anger and sadness. Heath et al. (2001) also found that urban

361   legends which featured a greater number of disgust evoking motifs were more

362   widely distributed on urban legend websites. Disgust does make an interesting

363   case study when examining the role of emotional content in the cultural

364   transmission of narrative, largely because of the question: why would people

365   choose to receive or transmit content which is negatively valenced? However,

366   disgust is somewhat uniquely affective as an emotion. It arouses powerful

367 behavioural responses and impacts on human society through our individual moral

368 choices and public policy on issues such as health, justice, social exclusion and

369 warfare (Curtis, 2011). This may make the findings of Nichols (2002) and Heath

370 et al. (2001) more difficult to generalise to an overall bias for emotional content

371 rather than a specific effect of disgust evoking content as it would be reasonable

372 to expect disgust to be uniquely effective in cultural transmission compared to

373 other emotions.

374   In this study, the emotion of disgust was shown to confer no particular

375 advantage in transmission compared to other emotions at the encode-and-retrieve

376 phase. The legend which featured disgusting content, Tumour-HN, was recalled

377 with equal fidelity to an amusing legend, Dinner-HP, suggesting that the

378 transmission fidelity was driven by the degree of emotion felt rather than the

379 specific emotion evoked. This also suggests that disgust is not special in terms of

380 cultural transmission and supports Heath at al.'s (2001) argument that emotional

381 selection is a general bias. The emotions of interest and surprise were evoked by

382 all the legends used in this study and in previous research they have been shown

383 to grant a transmission advantage and increase the communicability of anecdotes

384 (Peters et al., 2009). Both surprise and interest are unique in that they are fairly

385 neutral in terms of valence but may add more to the effect of a narrative in terms

386 of activation of the autonomic nervous system, a more surprising story would be

387 more arousing and likely to be more memorable or transmissible (Berger, 2011;

388 LaBar & Cabeza, 2006). The results of this study show no particular advantage to

389 surprise or interest as the results were driven more by the degree of emotion

390 evoked rather than specific emotions. Future research could examine how

different emotions combine: do neutrally valenced emotions like surprise bolster

other emotions and increase their effectiveness?

Following previous research into emotional bias in cultural transmission

(Eriksson & Coultas, 2014; Heath et al, 2001) but unlike previous research

examining other biases in cultural transmission that has used original material (i.e.

Mesoudi et al., 2006) this study used real urban legends. There are a number of

benefits to using 'real world' material in such an experiment but this can come at

the cost of full control over the features of the material. In this experiment efforts

were made to control for any confounding variables in terms of content. As

mentioned in the results section, survival information was found to be negatively

correlated with recall. This contradicts previous research which has found an

advantage for survival related information in recall (e.g. Nairne 2010; Nairne &

Pandeirada, 2008; Stubbersfield et al, 2015). It is unclear why that would be the

case here. The results of the regression show that the degree to which the legends

were rated as containing survival information explained far less of the variance in

the percentage of propositions recalled than the emotion level, suggesting that it is

correct to attribute the variation in recall to the different levels of emotion.

The results suggest that in general terms, material which evokes greater

levels of emotion will be more successful in cultural transmission due to an

advantage in cumulative recall. It is expected that, for an urban legend to be

successful over other urban legends in the social environment it must evoke a

greater degree of emotion. This is supported by a content analysis of 254 urban

legends, which found emotional content bias to be one of the most frequently

coded biases, being found in the majority of legends, with all of the emotions

415 coded being characterised by high arousal (Stubbersfield, Tehrani & Flynn, under

416 review). Emotional content is clearly a highly effective bias in the cultural

417 transmission of urban legends.

418   While the aim of this study was to examine emotional content bias as a

419 general phenomenon without focusing on a specific emotion, the range of

420 emotions evoked by the urban legends used was still fairly narrow. The emotions

421 are all characterised by high arousal for example. This is in part due to the use of

422 urban legends as material as these narratives will tend to evoke more arousing

423 emotions than some other narratives. Nevertheless, these results further support

424 the argument that, urban legends provide a fruitful avenue for research into the

425 effects of content biases on the cultural transmission and the evolution of

426 narratives. Emotional content bias is clearly effective in transmission and research

427 should look beyond the emotion of disgust to take into account other emotions

428 and consider if the efficacy of the bias varies between emotions, the study

429 presented here represents a significant step in that direction.

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436   **References**

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517   Table 1. *The legends used in this study with their respective emotion levels,*

518   *valence, two most frequently evoked emotions and code names.*

Legend	Emotion Level (Mean Score)	Valence	Emotions	Code Name
1. Steroids in chicken cause ovarian cysts	Low (5.5)	Negative*	Interest and Surprise	Cyst-LN
2. Woman has revenge on boyfriend with rotten fish in car.	Low (5)	Positive	Amusement and Interest	Fish-LP
3. Woman eats a tumour in a chicken burger.	High (6.5)	Negative	Disgust and Interest	Tumour-HN
4. Man farts in front of girlfriend's parents at a dinner party.	High (5.8)	Positive	Amusement and Surprise	Dinner-HP

519   * Although interest and surprise were the most frequently evoked emotions by this

520   legend these can be positive or negative, it also evoked fear, concern and sadness and as

521   such was designated negatively valenced.

522

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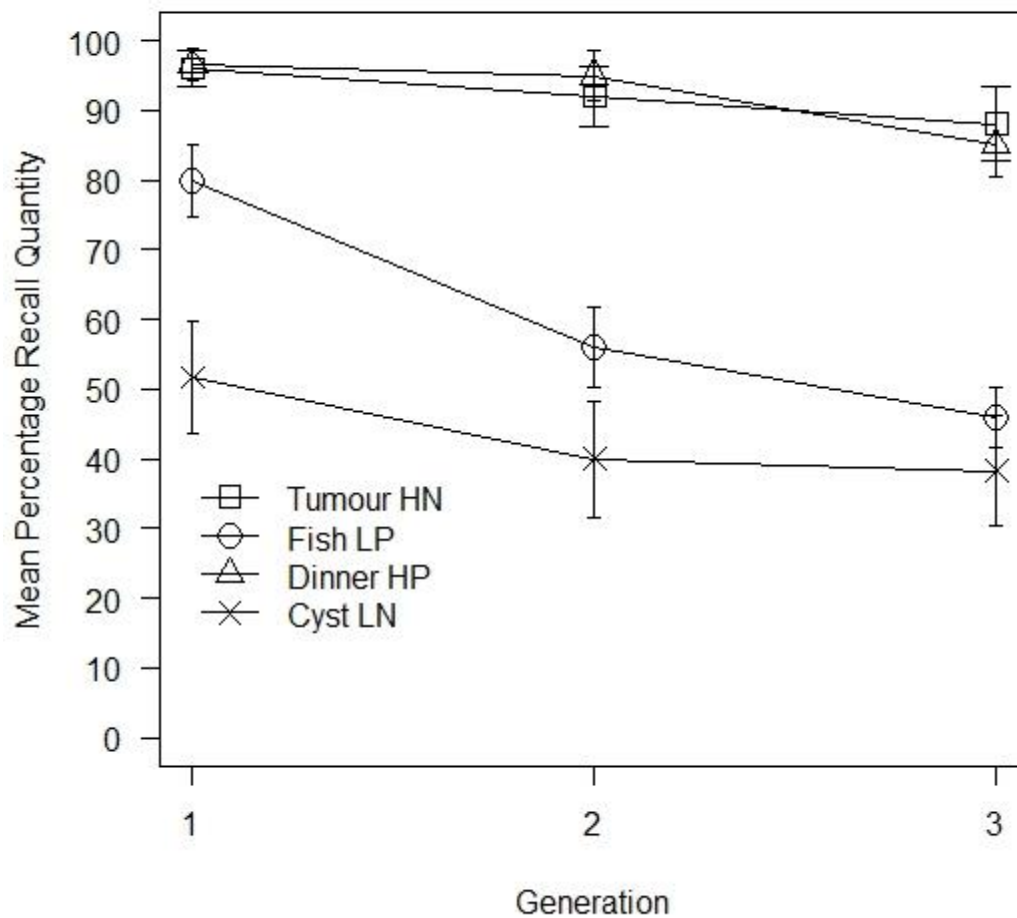
Figure 1. Mean percentage of original central propositions recalled by each

generation for each legend used in this study. Letter codes are used to indicate

emotion level and valence (corresponding with codes used in the article), with H

indicating 'high emotion', L indicating 'low emotion', P indicating positive valence

and N indicating negative valence. Error bars show standard error.

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531 **Supplementary Material**

532

533 *Table showing the mean differences between the legends used in Chapter 4 (column –*

534 *row).*

	Cyst-LN (2)	Dinner-HP (3)	Fish-LP (4)
Tumour-HN	E 1.00	E .70	E 1.50
(1)	P .75	P 1.50	P .90
	G -.75	G -2.30*	G -2.85*
	S -.60	S -3.30*	S -3.85*
	V -.85	V 2.25*	V 1.75*
2		E -.30	E .50
		P .75	P .15
		G -1.55*	G -2.10*
		S -2.70*	S -3.25*
		V 3.10*	V 2.60*
3			E .80
			P -.60
			G -.55
			S -.55
			V -.50

535 * Indicates legends are found is different subsets ($p \leq .05$)

536 Key:

537 E = Emotion score   S = Social information score

538 P = Plausibility score   V = Survival information score

539 G = Gender stereotype score

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