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Impact of product name and seasonal context on the sensory evaluation of a seasonally themed beverage

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1   Title: Impact of product name and seasonal context on the sensory evaluation of a seasonally

2   themed beverage

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4   Short running title: Impact of product name and seasonal context

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Abstract:

Information can have a powerful impact on liking, however, little is known about the effect of product name on consumer perception. Moreover, the influence of season, as a sensory relevant context, has never been investigated. The aim of this study was to investigate the effect of naming products with season evoking names and to compare responses between seasons. One hundred and fifty three consumers took part in either a summer (n=71) or winter (n=82) tasting of a drink named 'Winter Spice' or 'Refreshing Summer Berries'. Within each campaign, a cross-over design was applied and participants rated the drink for liking and sensory characteristics (check-all-that-apply). Neither the name nor the season had an impact on liking; however, both factors affected attribute description. The drink was described significantly more often as "spice", "Christmassy" and "mulled wine" when named 'Winter Spice', it was described more often as "blackcurrant" and "cherry" during the winter months.

Practical applications:

It appears possible to use product names to deliver different sensorial experiences without impacting negatively on liking providing that the names reflect adequately the product intrinsic qualities. Seasons appear to be a sensory relevant context, developing a greater understanding of the underpinning mechanisms is critical product development and marketing.

Keywords: season; product name; sensory; context; expectation; liking

1. Introduction:

Information of any nature can trigger specific expectations in the consumer and when the experienced product quality or intrinsic properties do not match those expectations, disconfirmation occurs. Four theories (assimilation, contrast, generalized negativity and assimilation-contrast) have been developed to model the impact of disconfirmation on acceptance (Anderson 1973) but all involve some element of shift in liking between blind rating (taken to assess the inherent quality of the product) and the informed rating (to estimate the impact of the information provided). Within this framework, the impact of extrinsic cues have been investigated and it is now well established that branding, health or nutrition claims, country or region of origin, product name or description, and even processing method can have a major effect on how consumers perceive food products and can directly impact on liking (Fernqvist and Ekelund 2014; Vidal *et al.* 2013). However, despite a recent report demonstrating how product descriptions can affect meal choice and vegetable intake (Turnwald *et al.* 2017), the effects of product name or description on liking are comparatively less well understood. The research literature is both limited and conflicting. Chung *et al.* (2012) found that the original Korean name and product description had little impact on liking of Korean-style salad dressings and beverages. Shankar *et al.* (2009) did not find any difference in liking for chocolates described as 'milk chocolate' or 'dark chocolate', while Allison *et al.* (2004) found that product description details did not impact significantly on overall liking of breakfast cereals and cheese crackers. On the other hand, product description of twelve commercial food products increased taste acceptability when expectations and actual experiences were well matched (Imm *et al.* 2012). In realistic settings, the use of evocative and descriptive food item names resulted in increased consumer satisfaction for a range of main meals and desserts (Wansink *et al.* 2005), while labelling beers as "beer" compared with "non-alcoholic beer" had a positive impact on liking (Silva *et*

3

60   *al.* 2017). In the same vein, salmon ice-cream was rated as significantly better when it was

61   described as "frozen savoury mousse" rather than "ice-cream" (Yeomans *et al.* 2008), and

62   labelling a vanilla ice-cream as natural increased its hedonic ratings (Parker and Penfield

63   2005).   Finally, mention of 'soy protein' on labels decreased liking ratings of bars compared

64   to those labelled 'protein' only (Wansink 2003).

65   Although there is comparatively less published on the impact of product description or name

66   on consumer perception of a product's intrinsic sensory characteristics, there is emerging

67   evidence of an effect. For example, chocolates described as 'dark chocolate' were perceived to

68   be more chocolaty than the same chocolates described as 'milk chocolates' (Shankar *et al.*

69   2009), food labelled 'ice-cream' tasted saltier than the same food labelled 'frozen savoury

70   mousse' (Yeomans *et al.* 2008), and changing food item names on a menu was shown to alter

71   the perceived ethnicity of the food items (Meiselman and Bell 1991).

72   The role of context, often understood as the actual physical environment (Petit and

73   Sieffermann 2007; King *et al.* 2004), social interaction (King *et al.* 2004) or even

74   consumption scenario (either provided by the experimenter or participant driven) (Hein *et al.*

75   2012) has long been of interest to sensory scientists and consumer researchers.   There are

76   mixed findings surrounding the impact of the physical environment. Studies have often

77   focused on comparing hedonic ratings obtained in sensory booths to those obtained in

78   realistic settings. Of those, some have reported a significant effect of the environment

79   (Bangcuyo *et al.* 2015; Hathaway and Simons 2017) on liking whilst others did not (Garcia-

80   Segovia *et al.* 2015). Environmental auditory cues, such as the music played at the point of

81   consumption has been shown to be influential on liking ratings for example, Spence and

82   Shankar (2010) concluded that the presence of semantically related environmental sounds

83   could enhance ratings of related flavor qualities establishing thus the importance of

84   congruency between the food and the consumption environment. A study reporting how the

85   smell of cinnamon was rated as more pleasant when experienced alongside Christmas carols

86   (Seo and Hummel 2011) demonstrated that cues pertaining to seasons can affect sensory

87   evaluation. In addition to this, certain odorants such as cinnamon have been shown to be

88   associated more closely to Christmas rather than summer, and both familiarity and

89   pleasantness ratings for cinnamon increased during the Christmas season when compared to

90   summer (Seo *et al*. 2009). However, up until now, sensory scientists have mostly focused on

91   the natural quality variation occurring in season dependent primary products (Bunning *et al*.

92   2009; Phillips *et al*. 2010) and the importance of seasonal exposure to odorant identification

93   (Wada et al. (2012) but have not specifically examined the impact of season as a sensory-

94   relevant context on a real food product perception (hedonic rating and perception). This

95   omission is surprising considering the growing commercial strategies surrounding non-

96   perishable seasonally themed goods (Lindell 2013) reflected in advertising patterns (Spencer

97   *et al.* 2014) and which have resulted in a sense that seasonal occasions have become too

98   commercialized (Mintel 2013).

99   The aim of this study was to investigate whether seasonally themed product names impact on

100   liking and on consumer perception of the product's intrinsic sensory characteristics when

101   consumed either in-season or out-of-season. In order to achieve this, a commercially

102   available season-themed beverage (Winter Spice Ribena) was tested with different names

103   pertaining to opposing semantic domains: 'Winter Spice' and 'Refreshing Summer Berries'.

104   The hypotheses were as follows:

105   - H_1: product name will have an impact on liking overall.

106   - H_2: the congruency between actual season and seasonally themed product name is critical to

107   liking: the winter themed drink will be better liked in winter while the summer themed drink

108   will be better liked in summer.

109   - H$_3$: the seasonally themed product name will impact on how consumers perceive the

110   product: attributes belonging to the same season-related semantic domain as the name will be

111   cited more often to describe the product.

112   - H$_4$: the season in which the testing is carried will impact on how consumers perceive the

113   product: attributes belonging to the same semantic domain as the season in which the testing

114   is carried out will be cited more often to describe the product.

115

116   2.   Material and Methods:

117   2.1. Samples:

118   A commercially available (Winter Spice Ribena, Lucozade Ribena Suntory Ltd, Uxbridge,

119   UK) concentrated fruit flavored drink to be made up by the consumer was selected for the

120   purpose of the study as 1) these drinks are popular in many countries 2) they are suitable for

121   all consumers (no alcohol, no major allergens, vegetarian and vegan friendly) 3) they are easy

122   to prepare consistently and the serving temperature is easy to control and 4) season themed

123   fruit flavored concentrated drink have started to appear on the U.K. market and are therefore

124   a good vehicle to study the impact of name and season on consumers' perception.

125   The sample preparation followed exactly the same protocol throughout the study. There was

126   no sensory manipulation of the product. Ribena's Winter Spice was reconstituted from

127   concentrated following the manufacturer's instructions the day before the panels. It was then

128   stored at 4°C until serving in small plastic single shot glasses (4 cl).

129   Each participant tested the same drink (Ribena, Winter Spice) 3 times; only the written

130   information provided on the answer sheet alongside the drink differed as such:

131   - 3 digit code (dummy sample, always presented first, results not used)

132   - The manufacturer describes this product as "Winter Spice" (hereafter WS)

133   - The manufacturer describes this product as "Refreshing Summer Berries" (hereafter SB)

134

135   2.2. Study design:

136   In order to study the effect of name and season on sensory evaluation, two campaigns of

137   identical tests relating to sample name were carried out during the summer and winter

138   months. The attributes of the main study CATA scale were generated during a preliminary

139   study. All sensory testing took place in individual sensory booths under "northern daylight"

140   lighting as specified in BS EN ISO 8589 (2014).

141

142   2.2.1. Preliminary study: attribute generation for the CATA scale

143   The selection of key attributes for check-all-that-apply (CATA) scales is one of the main

144   challenges of the CATA methodology and it has been recommended that results from

145   consumer focus groups should inform its design prior to the main study (Varela and Ares

146   2012). Therefore a focus group of 6 panelists generated and agreed a list of attributes

147   characterizing the sample over 2 sessions. During the 1st session (1 hour), panelists tested the

148   sample in blind condition in individual booths and were instructed to generate as many

149   attributes as they felt was necessary to fully characterize the drink. They then discussed their

150   findings and compared the terms used. In the 2nd second session (1 hour, 1 week later),

151   panelists tested the samples again using the list of attributes generated in the 1st session as a

152   CATA scale. Redundant attributes were then removed through discussion between the

153   panelists.

154   The final list of attributes generated was: artificial sweetener; berry; blackcurrant; cherry;

155   Christmassy; cinnamon; cloves; comforting; cranberry; elderflower; fruity; ginger; light;

meadow; medicinal; minty; mulled wine; orange; raspberry; refreshing; spice; star anise; strawberry; sweet; syrupy; thick; thirst quenching and warming. A CATA scale was created using these attributes ("other" was added as an option with the opportunity for the panelists to add any attribute they felt was missing).

2.2.2. Main study

The main study took place over 2 campaigns: a summer campaign (mid-June to mi-August with 71 participants) and a winter campaign (January and February with 82 participants). The procedure used during both was identical apart from the temperature in the sensory booths. In order to reinforce the seasonal context, the temperature in the sensory booths and training room (where the participant briefing took place) was controlled and kept at 23°C (+/- 1°C) for the summer campaign and 17°C (+/- 1°C) for the winter campaign.

2.2.2.1. Main study design

Within each campaign (summer/winter), a cross-over design was used so that each panelist tested the same drink under 3 different conditions: without information, with the drink described as 'winter spice' and 'refreshing summer berries'. The participants took part in another study for which chocolate samples were presented in between this study's 3 drinks. This ensured that memory effects were minimized. Participants were randomly allocated to receive SB then WS or WS then SB (Figure 1). The dummy sample was used to counteract the 1st sample effect (Lawless and Heymann 2010) and familiarize the panelists with the task. Samples were presented monadically and water and crackers were available for panelists to cleanse their palate between each.
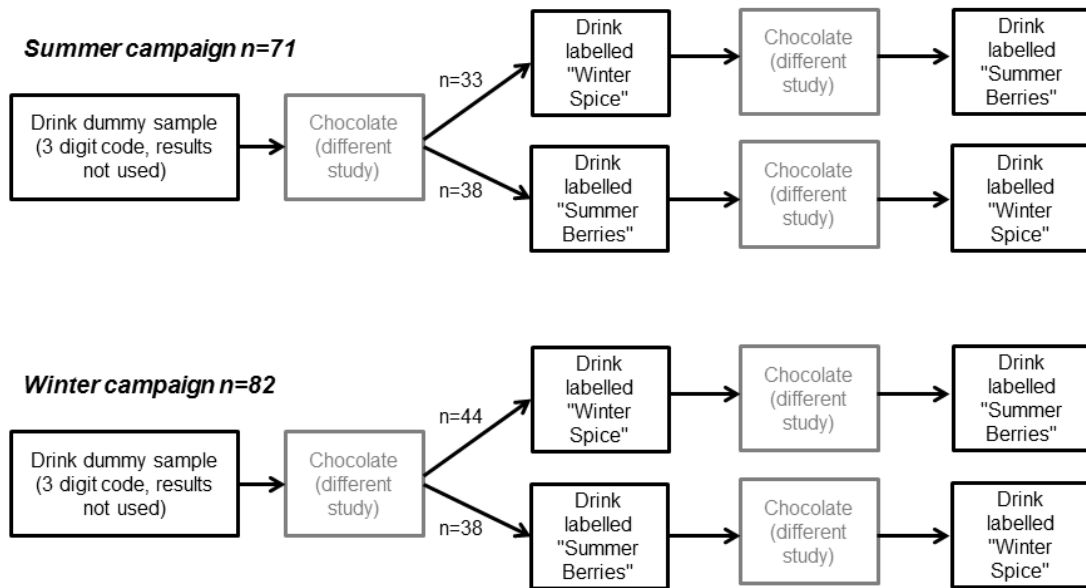
FIG. 1. STUDY DESIGN (CROSS-OVER, SUMMER N=71 AND WINTER N=82). EACH
PARTICIPANT TESTED THE SAME DRINK UNDER 3 CONDITIONS (NO
INFORMATION, RESULTS NOT SHOWN) AND WITH THE DESCRIPTIONS 'WINTER
SPICE' AND 'REFRESHING SUMMER BERRIES' (RANDOMIZED PRESENTATION
ORDER). GREY FONT IS USED TO DENOTE THAT PARTICIPANTS TASTED OTHER
SAMPLES (CHOCOLATE) FOR ANOTHER STUDY BETWEEN THIS STUDY'S
SAMPLES.

2.2.2.2.Main study task

Panelists were first asked to rate each sample for liking using a 9 point hedonic scale before
moving on to the sample description using the CATA scale derived from the preliminary
study. The order in which the attributes were presented was not balanced within subjects as

9

193 this does not significantly impact on results (Ares *et al.* 2013); however, 2 different attribute

194 orders were balanced between subjects.

195

196   2.3. Participants:

197 Participants for the preliminary attribute generation panel (n=6) were regular users of soft

198 fruit flavored drinks and volunteers drawn from students registered on a sensory evaluation

199 module. The main consumer panel (n=153) was mostly recruited via a sensory consumer

200 database set up for commercial work as well as by word of mouth. Seventy one panelists took

201 part in the summer campaign and 82 panelists took part in the winter campaign which is well

202 aligned with recommendations on CATA work with consumers (Varela and Ares, 2012). The

203 participants consisted of 99 females (64.7%) and 54 males (35.3%) and 60 participants

204 (39.2%) studied or worked in the field of food and nutrition, this encompasses roles in food

205 manufacturing (the food industry is the largest manufacturing sector in the U.K accounting

206 for 19% of it, Food and Drink Federation, 2017), food retailing, catering hospitality,

207 nutrition, dietetics and health sector. The participants' average age was 33.8 years (standard

208 deviation 16.9 years, range: 17 – 79 years). Participants were informed that they would be

209 tasting fruit flavored drinks made up from concentrated commercial products. They were not

210 required to be regular consumers as the aim of the study was not to compare hedonic scores

211 of different products but to investigate the impact on product name and seasons on product

212 characterization. The participants received a small gift of a value of £3 to £5 as a thank you

213 gesture for their time.

214

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217   2.4. Data analysis:

218 Hedonic ratings: within each campaign, the impact of product name on liking (H_1) was

219 analyzed using a paired t-test. Independent t-tests were carried out to test the impact of season

220 on liking of identically labelled drinks (H_2).

221 CATA results analysis: only attributes selected by at least 25% of the panelists in at least one

222 of the 4 tests (WB in summer / WB in winter / SB in summer / SB in winter) were kept for

223 analysis as the others were not deemed to be sufficiently representative of the samples.

224 Within each campaign, the impact of product name on attribute citation frequency (H_3) was

225 compared using a McNemar test, whereas the impact of actual season on attribute citation

226 frequency across seasons (H_4) was compared using Fischer's exact test as described

227 elsewhere for a similar design (Vidal *et al.* 2013).

228 All significance levels were set at $\alpha=0.05$ and all statistical tests were performed using SPSS

229 v24 (IBM, Armonk, USA).

230

231   2.5. Ethics:

232 The study received approval from the Faculty Research Ethics Committee (Business School).

233 Participants were informed fully of the study procedures and that they had a right to withdraw

234 at any point, written informed consent was obtained from each participant at the outset.

235

236   3. Results

237   3.1. Liking

238 Within the same campaign, there was no significant difference in liking (Table 1) of the drink

239 described as either 'Refreshing Summer Berries' or 'Winter Spice' (p=0.508 for the summer

240 campaign and p=0.081 for the winter campaign). On the basis of these results, H_1 (product

241 name will have an impact on liking) was rejected. There was no significant in liking between

242 the summer and winter campaigns (p=0.797 for 'Refreshing Summer Berries' and p=0.076 for

243 'Winter Spice'; Table 1) and H_2 (the congruency between actual season and seasonally

244 themed product description is critical to liking: the winter themed drink will be better liked in

245 winter while the summer themed drink will be better liked in summer) was also rejected.

246

247 TABLE 1: AVERAGE HEDONIC RATINGS (ON A 9 POINT HEDONIC SCALE) AND
248 STANDARD DEVIATION (IN BRACKETS) FOR THE SAME DRINK LABELLED
249 EITHER REFRESHING SUMMER BERRIES OR WINTER SPICE. NO SIGNIFICANT
250 DIFFERENCE WAS OBSERVED WITH RESPECT TO NAME OR SEASON.
251

	Summer berries	Winter Spice
Summer campaign	5.64 (1.70)	5.78 (1.54)
Winter campaign	5.57 (1.67)	5.26 (1.80)

252

253

254 3.2. Effect of product name on drinks' characterization

255 Panelists selected significantly different attributes to characterize the same product depending

256 on whether it was described as 'Winter Spice' or 'Refreshing Summer Berries' (Figure 2). The

257 same trend was observed in the summer and winter campaigns (Figure 2a and Figure 2b
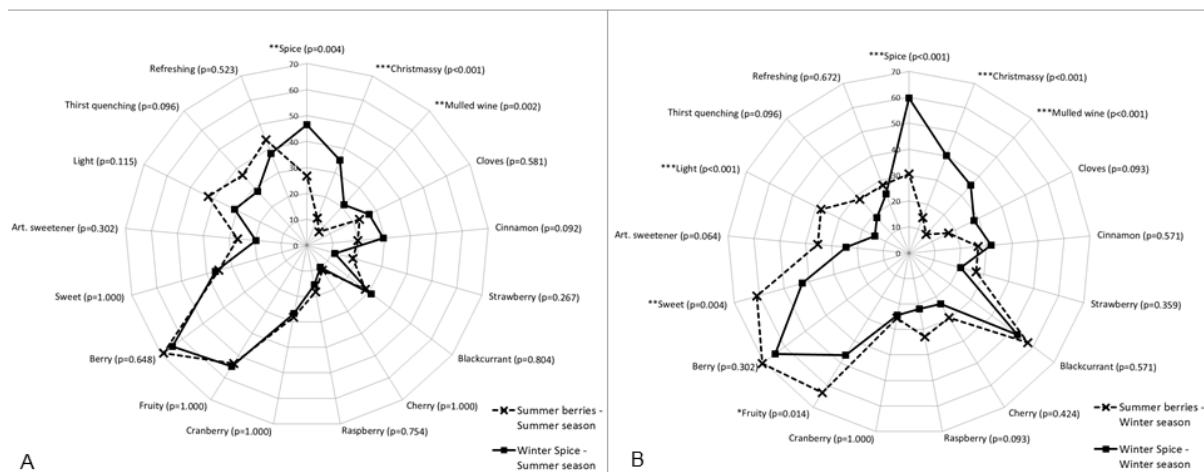
258 respectively).

FIG. 2 EFFECT OF PRODUCT NAME ON DESCRIPTIVE ATTRIBUTES (% PARTICIPANTS SELECTING ATTRIBUTE ON CATA SCALE) A) DURING THE SUMMER B) DURING THE WINTER

259

260 Naming the drink 'Winter Spice' rather than 'Refreshing Summer Berries' had a profound

261 effect on the prevalence of the drink being described as "spice", "Christmassy" and "mulled

262 wine" both in the summer and winter months (see p-values in Figures 2a and 2b).

263 Additionally, the 'Refreshing Summer Berries' drink was described significantly more often

264 as "fruity", "sweet" and "light" than the drink named 'Winter Spice' during the summer

265 months (see p-values in Figures 2a and 2b). H_3 (the seasonally themed product name will

266 impact on how consumers perceive the product: attributes belonging to the same semantic

267 domain as the name will be cited more often to describe the product) was therefore accepted.

268

269   3.3. Effect of season on product characterization

270 Both the drinks named 'Refreshing Summer Berries' (Figure 3a) and 'Winter Spice' (Figure

271 3b) were described as significantly more "blackcurrant" and "cherry" during the winter

272 months than the summer months. Additionally, 'Refreshing Summer Berries' was described

273 significantly more often as "raspberry" and "sweet" during the winter months than the

274 summer months and the 'Winter Spice' sample was described significantly more often as

275 "light" in the summer months than the winter months. In this respect, H_4 (the season in which

276 the testing is carried will impact on how consumers perceive the product: attributes belonging

13

277 to the same semantic domain as the season in which the testing is carried out will be cited

278 more often to describe the product) was only partially accepted as the difference in product

279 characterization observed did not reflect the season related semantic domain tested and was
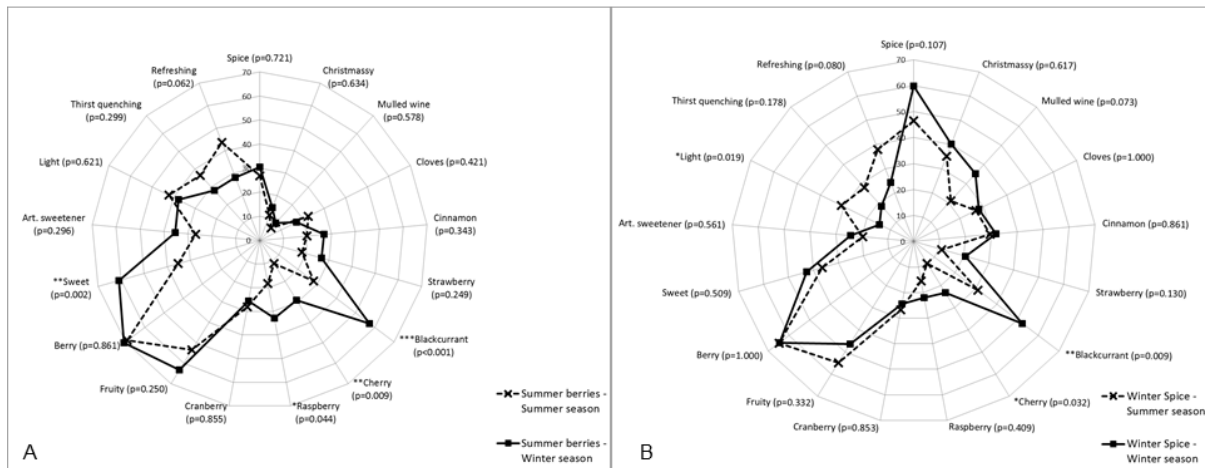
280 therefore not the one which was expected.

281

FIG. 3. EFFECT OF SEASONS ON DESCRIPTIVE ATTRIBUTES (% PARTICIPANTS SELECTING ATTRIBUTE ON CATA SCALE) A) "REFRESHING SUMMER BERRIES" B) "WINTER SPICE"

282

283   4. Discussion

284 Stating that the manufacturer described the drink as "Refreshing Summer Berries" or "Winter

285 Spice" did not have an impact on liking of the drink which is in agreement with other studies,

286 for example, Allison *et al.* 2004; Chung *et al.* 2012; Bell *et al.* 1994 and Shankar *et al.* 2009

287 have all reported a lack of impact of descriptive labelling information (product name and/or

288 description) on liking. However a significant impact is more commonly observed (Wansink

289 2003; Wansink *et al.* 2005; Silva *et al.* 2017; Yeomans *et al.* 2008; Imm *et al.* 2012; Parker

290 and Penfield 2005). The reason for the discrepancy is likely due to the nature of the

291 description or name and the expectations they may trigger (Deliza and MacFie 1996). In the

292 instances where no impact was noted, the name or description used were very factual and

293 closely aligned with the reality of the product: "chocolate-flavoured breakfast cereals"

14

294 (Allison *et al.* 2004), "salad with Korean style mustard dressing" (Chung *et al.* 2012) and

295 "milk chocolate" (Shankar *et al*. 2009). In contrast, when an impact was noted, the product

296 name or description was more likely to be evocative and emotionally charged: "succulent"

297 (Wansik et al. 2005), "artificial"/"natural" (Parker and Penfield 2005) or offer a drastic

298 contrast between expectations and experience as in the case of the frozen savory mousse

299 labelled ice-cream (Yeomans *et al*. 2008). It is therefore likely that the product names or

300 descriptions used in the studies where no impact was observed (including this one) did not

301 trigger expectations at odds with the actual sensory experience which can affect liking (Imm

302 et al. 2012). This is not surprising considering that the product names used in this study were

303 carefully selected to match the semantic domains covered by the list of attributes generated in

304 blind testing conditions.

305 Whether the drink was described as "Refreshing Summer Berries" or "Winter Spice" had a

306 striking effect on the attributes which panelists selected to characterize the drink. There is

307 less work looking specifically at the impact of product name on how consumers perceive its

308 sensory characteristics. When it has been reported, a significant impact was noted (Shankar *et*

309 *al.* 2009; Yeomans *et al.* 2008; Meiselman and Bell 1991) however, the attributes considered

310 were generally highly specific and few. Similar to this study, altering both food names and

311 environment decoration (British/Italian themes) did not affect liking although it impacted

312 significantly on the perceived ethnicity of the food items (Bell *et al.* 1994). It has been

313 suggested that using descriptive wording to characterize a product generates expectations of

314 what the product should be (Tuorila *et al.* 1994) and makes those elements more salient,

315 directing the consumers' attention to related attributes whilst other attributes are less well

316 attended or unattended (Piqueras-Fiszman and Spence 2015).

317 Whilst the actual testing season did not have an impact on liking, panelists used different

318 attributes to characterize the same sample with the same description in summer and winter,

319   for example the drink was significantly more often characterized as "cherry" and

320   "blackcurrant" during the winter months than during the summer and this regardless of

321   whether it was named "Winter Spice" or "Refreshing Summer Berries". These findings

322   provide an interesting example of how a product with the same name but consumed in a

323   different context with respect to season can be perceived differently. This is not surprising

324   considering that familiarity ratings for odorants associated with a specific season increase in

325   that season (Seo *et al*. 2009). The role of actual physical environment or evoked environment

326   on liking or perception has been of interest to others with mixed findings (Bangcuyo *et al.*

327   2015; García-Segovia *et al*. 2015; Hathaway and Simon 2017; Jaeger *et al.* 2017). It must be

328   noted that the changes in environment between the summer and winter seasons were subtle

329   and far from the more drastic changes usually operated in other studies where data acquired

330   in sensory booths and realistic environment are compared (Bangcuyo *et al.* 2015; García-

331   Segovia *et al*. 2015; Hathaway and Simon 2017). Moreover, the changes to the environment

332   were implicit rather than explicit as is often the case in studies where context is evoked by

333   asking the consumers to imagine themselves in a specific situation. Considering the fact that

334   sensory responses to evoked contexts have been shown to be similar to those where no-

335   context is evoked (Jaeger et al. 2017), it is therefore not surprising that the impact of season

336   as a subtle and implicit context was found to be modest compared to that of name in this

337   study. Social and cultural context can have an impact on liking and characterization. For

338   example, Lahne *et al.* (2014) showed that liking and product characterization were moderated

339   by consumers' general involvement with food. There is therefore an understanding that

340   "sensory perception is a learned, active, and directed practice" rather than the sole result of an

341   external stimuli. In the context of this study, the social and cultural element is framed by the

342   consumer's past experience and appropriation of seasons' cultural manifestations. Although

343   there was a significant effect of season on product characterization, the link between the

344 semantic domains of the actual season and attributes selected by participants was not obvious

345 or systematic (for example, blackcurrants and cherries are in season during the summer

346 months rather than the winter months however these attributes were selected more often to

347 describe the drink during the winter months). In this respect, the direction of the effect was

348 not the one expected. It can be speculated that although the seasonal context in which the test

349 was carried out had an impact on how the product was perceived, the underpinning

350 mechanism was not the result of the seasonal context evoking a specific season-related

351 semantic domain. As the sensory booths' temperature had been manipulated to reinforce the

352 seasonal context, one possibility could be that either the temperature of the environment

353 and/or the contrast in temperature between the environment and the drink are driving factors

354 for the sensory experience. To the author's knowledge there are no studies on the topic to

355 either support or reject this. Another possible explanation is that olfactory discrimination

356 performance differs with seasons (Goel and Grasso 2004). As a result some odorants may be

357 better detected during the winter rather than summer and get cited more often to characterize

358 a sample while other odorants may show the opposite pattern.

359 The study's main limitations relate to the generalizability of the results to other products /

360 product categories which should be expanded to get a comprehensive picture of the subject.

361 Additionally, the two product names used in this study were congruent with the product's

362 intrinsic characteristics. Using an incongruent product name may have resulted in different

363 outcomes by generating expectations at odds with the subsequent sensory experience. In this

364 respect, comparing congruent and incongruent product names may be of academic interest

365 however, its bearing on real world application would be more limited.

366

367

5. Conclusions

Overall, liking was driven by the product sensory characteristics rather than the name or season. It could be hypothesized that liking is more readily affected by the product name or description when it is at odds with the reality of the product or possesses a strong affective valence and this should be formally tested in further studies. In contrast, it appears possible to prime subjects to detect specific sensory characteristics and thus generate different sensory experiences by carefully selecting the name or description of the food product. Season, as a sensory relevant context, had a more modest impact than name and more work is required to understand the underpinning mechanism.

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