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

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

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
In the same vein, salmon ice-cream was rated as significantly better when it was described as "frozen savoury mousse" rather than "ice-cream" (Yeomans et al. 2008), and labelling a vanilla ice-cream as natural increased its hedonic ratings (Parker and Penfield 2005). Finally, mention of 'soy protein' on labels decreased liking ratings of bars compared to those labelled 'protein' only (Wansink 2003).

Although there is comparatively less published on the impact of product description or name on consumer perception of a product’s intrinsic sensory characteristics, there is emerging evidence of an effect. For example, chocolates described as 'dark chocolate' were perceived to be more chocolaty than the same chocolates described as 'milk chocolates' (Shankar et al. 2009), food labelled ‘ice-cream’ tasted saltier than the same food labelled ‘frozen savoury mousse’ (Yeomans et al. 2008), and changing food item names on a menu was shown to alter the perceived ethnicity of the food items (Meiselman and Bell 1991).

The role of context, often understood as the actual physical environment (Petit and Sieffermann 2007; King et al. 2004), social interaction (King et al. 2004) or even consumption scenario (either provided by the experimenter or participant driven) (Hein et al. 2012) has long been of interest to sensory scientists and consumer researchers. There are mixed findings surrounding the impact of the physical environment. Studies have often focused on comparing hedonic ratings obtained in sensory booths to those obtained in realistic settings. Of those, some have reported a significant effect of the environment (Bangcuyo et al. 2015; Hathaway and Simons 2017) on liking whilst others did not (Garcia-Segovia et al. 2015). Environmental auditory cues, such as the music played at the point of consumption has been shown to be influential on liking ratings for example, Spence and Shankar (2010) concluded that the presence of semantically related environmental sounds could enhance ratings of related flavor qualities establishing thus the importance of congruency between the food and the consumption environment. A study reporting how the
smell of cinnamon was rated as more pleasant when experienced alongside Christmas carols (Seo and Hummel 2011) demonstrated that cues pertaining to seasons can affect sensory evaluation. In addition to this, certain odorants such as cinnamon have been shown to be associated more closely to Christmas rather than summer, and both familiarity and pleasantness ratings for cinnamon increased during the Christmas season when compared to summer (Seo et al. 2009). However, up until now, sensory scientists have mostly focused on the natural quality variation occurring in season dependent primary products (Bunning et al. 2009; Phillips et al. 2010) and the importance of seasonal exposure to odorant identification (Wada et al. (2012) but have not specifically examined the impact of season as a sensory-relevant context on a real food product perception (hedonic rating and perception). This omission is surprising considering the growing commercial strategies surrounding non-perishable seasonally themed goods (Lindell 2013) reflected in advertising patterns (Spencer et al. 2014) and which have resulted in a sense that seasonal occasions have become too commercialized (Mintel 2013).

The aim of this study was to investigate whether seasonally themed product names impact on liking and on consumer perception of the product’s intrinsic sensory characteristics when consumed either in-season or out-of-season. In order to achieve this, a commercially available season-themed beverage (Winter Spice Ribena) was tested with different names pertaining to opposing semantic domains: 'Winter Spice' and 'Refreshing Summer Berries'.

The hypotheses were as follows:

- **H1**: product name will have an impact on liking overall.

- **H2**: the congruency between actual season and seasonally themed product name is critical to liking: the winter themed drink will be better liked in winter while the summer themed drink will be better liked in summer.
- H₃: the seasonally themed product name will impact on how consumers perceive the product: attributes belonging to the same season-related semantic domain as the name will be cited more often to describe the product.

- H₄: the season in which the testing is carried will impact on how consumers perceive the product: attributes belonging to the same semantic domain as the season in which the testing is carried out will be cited more often to describe the product.

2. Material and Methods:
   2.1. Samples:

A commercially available (Winter Spice Ribena, Lucozade Ribena Suntory Ltd, Uxbridge, UK) concentrated fruit flavored drink to be made up by the consumer was selected for the purpose of the study as 1) these drinks are popular in many countries 2) they are suitable for all consumers (no alcohol, no major allergens, vegetarian and vegan friendly) 3) they are easy to prepare consistently and the serving temperature is easy to control and 4) season themed fruit flavored concentrated drink have started to appear on the U.K. market and are therefore a good vehicle to study the impact of name and season on consumers' perception.

The sample preparation followed exactly the same protocol throughout the study. There was no sensory manipulation of the product. Ribena's Winter Spice was reconstituted from concentrated following the manufacturer's instructions the day before the panels. It was then stored at 4°C until serving in small plastic single shot glasses (4 cl).

Each participant tested the same drink (Ribena, Winter Spice) 3 times; only the written information provided on the answer sheet alongside the drink differed as such:

- 3 digit code (dummy sample, always presented first, results not used)
- The manufacturer describes this product as "Winter Spice" (hereafter WS)

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

2.2. Study design:

In order to study the effect of name and season on sensory evaluation, two campaigns of identical tests relating to sample name were carried out during the summer and winter months. The attributes of the main study CATA scale were generated during a preliminary study. All sensory testing took place in individual sensory booths under "northern daylight" lighting as specified in BS EN ISO 8589 (2014).

2.2.1. Preliminary study: attribute generation for the CATA scale

The selection of key attributes for check-all-that-apply (CATA) scales is one of the main challenges of the CATA methodology and it has been recommended that results from consumer focus groups should inform its design prior to the main study (Varela and Ares 2012). Therefore a focus group of 6 panelists generated and agreed a list of attributes characterizing the sample over 2 sessions. During the 1st session (1 hour), panelists tested the sample in blind condition in individual booths and were instructed to generate as many attributes as they felt was necessary to fully characterize the drink. They then discussed their findings and compared the terms used. In the 2nd second session (1 hour, 1 week later), panelists tested the samples again using the list of attributes generated in the 1st session as a CATA scale. Redundant attributes were then removed through discussion between the panelists.

The final list of attributes generated was: artificial sweetener; berry; blackcurrant; cherry; 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 mid-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
this does not significantly impact on results (Ares et al. 2013); however, 2 different attribute
orders were balanced between subjects.

2.3. Participants:

Participants for the preliminary attribute generation panel (n=6) were regular users of soft
fruit flavored drinks and volunteers drawn from students registered on a sensory evaluation
module. The main consumer panel (n=153) was mostly recruited via a sensory consumer
database set up for commercial work as well as by word of mouth. Seventy one panelists took
part in the summer campaign and 82 panelists took part in the winter campaign which is well
aligned with recommendations on CATA work with consumers (Varela and Ares, 2012). The
participants consisted of 99 females (64.7%) and 54 males (35.3%) and 60 participants
(39.2%) studied or worked in the field of food and nutrition, this encompasses roles in food
manufacturing (the food industry is the largest manufacturing sector in the U.K accounting
for 19% of it, Food and Drink Federation, 2017), food retailing, catering hospitality,
nutrition, dietetics and health sector. The participants’ average age was 33.8 years (standard
deviation 16.9 years, range: 17 – 79 years). Participants were informed that they would be
tasting fruit flavored drinks made up from concentrated commercial products. They were not
required to be regular consumers as the aim of the study was not to compare hedonic scores
of different products but to investigate the impact on product name and seasons on product
characterization. The participants received a small gift of a value of £3 to £5 as a thank you
gesture for their time.
2.4. Data analysis:

Hedonic ratings: within each campaign, the impact of product name on liking (H\textsubscript{1}) was analyzed using a paired t-test. Independent t-tests were carried out to test the impact of season on liking of identically labelled drinks (H\textsubscript{2}).

CATA results analysis: only attributes selected by at least 25\% of the panelists in at least one of the 4 tests (WB in summer / WB in winter / SB in summer / SB in winter) were kept for analysis as the others were not deemed to be sufficiently representative of the samples.

Within each campaign, the impact of product name on attribute citation frequency (H\textsubscript{3}) was compared using a McNemar test, whereas the impact of actual season on attribute citation frequency across seasons (H\textsubscript{4}) was compared using Fischer's exact test as described elsewhere for a similar design (Vidal \textit{et al.} 2013).

All significance levels were set at $\alpha=0.05$ and all statistical tests were performed using SPSS v24 (IBM, Armonk, USA).

2.5. Ethics:

The study received approval from the Faculty Research Ethics Committee (Business School). Participants were informed fully of the study procedures and that they had a right to withdraw at any point, written informed consent was obtained from each participant at the outset.

3. Results

3.1. Liking

Within the same campaign, there was no significant difference in liking (Table 1) of the drink described as either 'Refreshing Summer Berries' or 'Winter Spice' ($p=0.508$ for the summer
campaign and p=0.081 for the winter campaign). On the basis of these results, H₁ (product name will have an impact on liking) was rejected. There was no significant in liking between the summer and winter campaigns (p=0.797 for 'Refreshing Summer Berries' and p=0.076 for 'Winter Spice'; Table 1) and H₂ (the congruency between actual season and seasonally themed product description is critical to liking: the winter themed drink will be better liked in winter while the summer themed drink will be better liked in summer) was also rejected.

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<thead>
<tr>
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<th>Summer berries</th>
<th>Winter Spice</th>
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<tr>
<td><strong>Summer campaign</strong></td>
<td>5.64 (1.70)</td>
<td>5.78 (1.54)</td>
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<tr>
<td><strong>Winter campaign</strong></td>
<td>5.57 (1.67)</td>
<td>5.26 (1.80)</td>
</tr>
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3.2. Effect of product name on drinks’ characterization

Panelists selected significantly different attributes to characterize the same product depending on whether it was described as 'Winter Spice' or 'Refreshing Summer Berries' (Figure 2). The same trend was observed in the summer and winter campaigns (Figure 2a and Figure 2b respectively).
Naming the drink 'Winter Spice' rather than 'Refreshing Summer Berries' had a profound effect on the prevalence of the drink being described as "spice", "Christmassy" and "mulled wine" both in the summer and winter months (see p-values in Figures 2a and 2b). Additionally, the 'Refreshing Summer Berries' drink was described significantly more often as "fruity", "sweet" and "light" than the drink named 'Winter Spice' during the summer months (see p-values in Figures 2a and 2b). H₃ (the seasonally themed product name will impact on how consumers perceive the product: attributes belonging to the same semantic domain as the name will be cited more often to describe the product) was therefore accepted.

### 3.3. Effect of season on product characterization

Both the drinks named 'Refreshing Summer Berries' (Figure 3a) and 'Winter Spice' (Figure 3b) were described as significantly more "blackcurrant" and "cherry" during the winter months than the summer months. Additionally, 'Refreshing Summer Berries' was described significantly more often as "raspberry" and "sweet" during the winter months than the summer months and the 'Winter Spice' sample was described significantly more often as "light" in the summer months than the winter months. In this respect, H₄ (the season in which the testing is carried will impact on how consumers perceive the product: attributes belonging
to the same semantic domain as the season in which the testing is carried out will be cited more often to describe the product) was only partially accepted as the difference in product characterization observed did not reflect the season related semantic domain tested and was therefore not the one which was expected.

4. Discussion

Stating that the manufacturer described the drink as "Refreshing Summer Berries" or "Winter Spice" did not have an impact on liking of the drink which is in agreement with other studies, for example, Allison et al. 2004; Chung et al. 2012; Bell et al. 1994 and Shankar et al. 2009 have all reported a lack of impact of descriptive labelling information (product name and/or description) on liking. However a significant impact is more commonly observed (Wansink 2003; Wansink et al. 2005; Silva et al. 2017; Yeomans et al. 2008; Imm et al. 2012; Parker and Penfield 2005). The reason for the discrepancy is likely due to the nature of the description or name and the expectations they may trigger (Deliza and MacFie 1996). In the instances where no impact was noted, the name or description used were very factual and closely aligned with the reality of the product: "chocolate-flavoured breakfast cereals"
(Allison et al. 2004), "salad with Korean style mustard dressing" (Chung et al. 2012) and "milk chocolate" (Shankar et al. 2009). In contrast, when an impact was noted, the product name or description was more likely to be evocative and emotionally charged: "succulent" (Wansik et al. 2005), "artificial"/"natural" (Parker and Penfield 2005) or offer a drastic contrast between expectations and experience as in the case of the frozen savory mousse labelled ice-cream (Yeomans et al. 2008). It is therefore likely that the product names or descriptions used in the studies where no impact was observed (including this one) did not trigger expectations at odds with the actual sensory experience which can affect liking (Imm et al. 2012). This is not surprising considering that the product names used in this study were carefully selected to match the semantic domains covered by the list of attributes generated in blind testing conditions.

Whether the drink was described as "Refreshing Summer Berries" or "Winter Spice" had a striking effect on the attributes which panelists selected to characterize the drink. There is less work looking specifically at the impact of product name on how consumers perceive its sensory characteristics. When it has been reported, a significant impact was noted (Shankar et al. 2009; Yeomans et al. 2008; Meiselman and Bell 1991) however, the attributes considered were generally highly specific and few. Similar to this study, altering both food names and environment decoration (British/Italian themes) did not affect liking although it impacted significantly on the perceived ethnicity of the food items (Bell et al. 1994). It has been suggested that using descriptive wording to characterize a product generates expectations of what the product should be (Tuorila et al. 1994) and makes those elements more salient, directing the consumers' attention to related attributes whilst other attributes are less well attended or unattended (Piqueras-Fiszman and Spence 2015).

Whilst the actual testing season did not have an impact on liking, panelists used different attributes to characterize the same sample with the same description in summer and winter,
for example the drink was significantly more often characterized as "cherry" and "blackcurrant" during the winter months than during the summer and this regardless of whether it was named "Winter Spice" or "Refreshing Summer Berries". These findings provide an interesting example of how a product with the same name but consumed in a different context with respect to season can be perceived differently. This is not surprising considering that familiarity ratings for odorants associated with a specific season increase in that season (Seo et al. 2009). The role of actual physical environment or evoked environment on liking or perception has been of interest to others with mixed findings (Bangcuyo et al. 2015; García-Segovia et al. 2015; Hathaway and Simon 2017; Jaeger et al. 2017). It must be noted that the changes in environment between the summer and winter seasons were subtle and far from the more drastic changes usually operated in other studies where data acquired in sensory booths and realistic environment are compared (Bangcuyo et al. 2015; García-Segovia et al. 2015; Hathaway and Simon 2017). Moreover, the changes to the environment were implicit rather than explicit as is often the case in studies where context is evoked by asking the consumers to imagine themselves in a specific situation. Considering the fact that sensory responses to evoked contexts have been shown to be similar to those where no-context is evoked (Jaeger et al. 2017), it is therefore not surprising that the impact of season as a subtle and implicit context was found to be modest compared to that of name in this study. Social and cultural context can have an impact on liking and characterization. For example, Lahne et al. (2014) showed that liking and product characterization were moderated by consumers' general involvement with food. There is therefore an understanding that "sensory perception is a learned, active, and directed practice" rather than the sole result of an external stimuli. In the context of this study, the social and cultural element is framed by the consumer's past experience and appropriation of seasons' cultural manifestations. Although there was a significant effect of season on product characterization, the link between the
semantic domains of the actual season and attributes selected by participants was not obvious or systematic (for example, blackcurrants and cherries are in season during the summer months rather than the winter months however these attributes were selected more often to describe the drink during the winter months). In this respect, the direction of the effect was not the one expected. It can be speculated that although the seasonal context in which the test was carried out had an impact on how the product was perceived, the underpinning mechanism was not the result of the seasonal context evoking a specific season-related semantic domain. As the sensory booths’ temperature had been manipulated to reinforce the seasonal context, one possibility could be that either the temperature of the environment and/or the contrast in temperature between the environment and the drink are driving factors for the sensory experience. To the author's knowledge there are no studies on the topic to either support or reject this. Another possible explanation is that olfactory discrimination performance differs with seasons (Goel and Grasso 2004). As a result some odorants may be better detected during the winter rather than summer and get cited more often to characterize a sample while other odorants may show the opposite pattern.

The study’s main limitations relate to the generalizability of the results to other products / product categories which should be expanded to get a comprehensive picture of the subject. Additionally, the two product names used in this study were congruent with the product’s intrinsic characteristics. Using an incongruent product name may have resulted in different outcomes by generating expectations at odds with the subsequent sensory experience. In this respect, comparing congruent and incongruent product names may be of academic interest however, its bearing on real world application would be more limited.
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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