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FROM PRODUCT FORMULATION TO CONSUMER EXPERIENCE

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HOW TO MEASURE THE DRINKING EXPERIENCE OF BEER TO DRIVE NEW PRODUCT DEVELOPMENT

Gómez-Corona C. [a], Chollet S. [b], Escalona-Buendía H. [a], Valentin D. [c]

[a] *Sensory and Consumer Laboratory, Biotechnology Department, Universidad Autónoma Metropolitana, Av. San Rafael Atlixco No. 186, 09340, México City, México*
[b] *ISA Lille, Institut Régional Agroalimentaire Charles Viollette, EA 7394, 48 boulevard Vauban, 59046 Lille, France*
[c] *Centre des Sciences du Goût et de l'Alimentation, CNRS, INRA, Univ. Bourgogne Franche-Comté, F-21000 Dijon, France.*
Email: *carlos.gomezcorona@gmail.com*; *hbeb@xanum.uam.mx*

ABSTRACT

Consumers interact with products using three mental systems: affects, senses, and cognition. These systems give rise to "consumer experience". Two studies were conducted to measure the experience of drinking craft and industrial beers. The first study consisted in an online survey with 75 consumers whose goal was to select phrases related to each system. A set of 18 phrases was selected to perform the second study in which consumers had to drink industrial beers, rate liking and select phrases that best described their experience of drinking in a CATA list. CATA phrases were related to the affective, sensory or cognitive systems. Beers were rated similar in liking, however, significant differences were observed for the CATA phrases. Cognitive phrases were more frequently checked for craft beers while sensory and affective phrases were more frequently checked for industrial beers.

Keywords: *drinking experience, consumer experience, beer.*

1. INTRODUCTION

Consumers do not buy randomly, every product that is consumed and every service that is used corresponds to multiple needs. Consumers are therefore in the constant quest to find solutions to fulfil their needs. According to Darpy (2012) they are not interested in what the products are, but in what the products can do for them. They do not buy the characteristics of the products, but the benefits that they can obtain by their consumption or use, whether these benefits are functional, symbolic or experiential. According to Lipovetsky & Serroy (2013) what defines contemporary hyper-consumption is an aesthetic approach of production. This aesthetic approach makes an echo in the food and beverage consumption with sophisticated bottles, beautiful packages, special presentations, hyper-realism and product individualization. Food design, for example, is now a well-known branch of industrial design, not only present at innovation fairs (*e.g.* Sial Paris), but also in the academy (*e.g.* Scuola Politecnica di Design) and industry (*e.g.* Enivrance). It is transforming the way people see, use and taste a food product to make it a unique food product experience.

Today the food and beverage product developers need to make products that are not only functional but that also trigger a unique experience. This experience includes its perception, the identification process it triggers, the cognitive associations and memories it activates, the feelings and emotions it elicits, and the evaluative judgements it brings about (Schifferstein & Cleiren, 2005). In the beverage domain, alcoholic beverages have been studied for their capacity to evoke positive or negative emotions, to modify mood (Desmet, 2008) as well as for their cultural relevance (Simonnet-Toussaint 2006; Do, Patris, & Valentin 2009), their functional benefits (Guinard *et al.*, 1998), and economic impact (Euromonitor, 2014). Alcoholic beverages are not just "beverages" and as such they constitute a good model to study consumers' product experience.

The aim of this research was to understand the experience of drinking beer by assessing the impact of different dimensions used in the interaction with the product: affects, senses and cognition. Two studies were performed for this purpose. The objective of the first study was to define a set of phrases that can be used to relate affects, senses and cognition while drinking beer in a Check-All-That-Apply (CATA) question. The objective of the second study was to measure the drinking experience of beers in a real consumption context using the final CATA phrases issued from study 1.

2. STUDY 1 – CATA SELECTION PHRASES

2.1. Material and methods

2.1.1. Material

A list of 45 phrases were derived from two previous studies: a) a consumer ethnography (Gómez-Corona *et al.*, 2016) whose goal was to understand the habits, attitudes and motivations towards beer consumption in Mexico, and b) a contextual focus group aiming at examining the variables involved in the beer drinking experience. This list included 15 sensory, 15 cognitive, and 15 affective phrases (Table 1).

2.1.2. Participants

Eighty consumers took part of the study. Participants were recruited with the support of an online consumer panel company (www.cint.com). They were recruited based on their age (25-45 years), gender, beer consumption (at least once a month), and were born and lived in Mexico City.

2.1.3. Procedure

The internet questionnaire consisted of basic demographic information (age, gender, and beer consumption), and the key questions were appropriateness of the phrase to describe a beer (Q1. "How appropriate is this phrase to describe a beer" in a five-point scale from 1-not at all to 5-very much), and categorization of the phrase into affective, cognitive or sensory dimensions (Q2. "Do you think this phrase describe the way you feel about the product" – affective dimension; "the way you think when consuming the product" – cognitive dimension, or "the way you perceive it threw your senses" – sensory dimension).

2.2. Data analysis

The scale used for the appropriateness question was analyzed using a 3-way ANOVA, fixed model: dimension + phrase + gender + phrase×gender. When significant differences were found at $\alpha = 0.05$, a multiple comparison Tukey post hoc test was performed. The phrases were then plotted in an interval plot, using one plot for each dimension (sensory, affective and cognitive) to identify visually the phrases that were rated below the mean for the appropriateness variable. Afterwards, the sensory, affective or cognitive categorization data were transformed into frequencies for each phrase and 2×2 tables were built and analyzed using a paired comparison Fisher's exact test. Significant differences were identified at $\alpha = 0.05$. For each dimension the phrases with an appropriateness score above the dimension mean score and a frequency to describe the dimension significantly higher than the frequency to describe the other dimensions (*e.g.* a phrase for the sensory dimension was selected for being above the mean score of appropriateness and higher in the frequency for describing sensory attributes). At the end of the analysis 18 phrases (six per dimensions) were selected for the CATA list of study 2.

2.3. Results

Results from the appropriateness analysis show that the mean scores are similar across dimensions, no significant difference was found. The mean score for sensory phrases (Figure 1) was 4.1, followed by 3.8 for the affective phrases and 3.7 for the cognitive phrases. No significant gender effect was found, meaning that men and women rated in a similar way the appropriateness of the phrases for each dimension.

For the sensory dimension significant differences were observed across phrases ($p < 0.000$), with four phrases significantly higher than the average (S10, S13, S31, S34). No gender effect was found. For the affective dimension, there were also significant differences across the phrases ($p < 0.000$) with eight phrases above the mean score (A8, A11, A20, A26, A32, A35, and A41). Finally, for the cognitive dimension significant differences were observed across phrases ($p < 0.004$). The phrases that were significantly lower than the others were C39 and C45.

Table 1. Phrases used in study 1, divided in sensory, affective and cognitive dimensions.

Sensory	Affective	Cognitive
1. I will take the time to enjoy the beer, smell and taste it	2. Find something unexpected in the beer surprises me	3. I like to read the label of this beer
4. I enjoy this beer will all my senses	5. I fill calmed when I drink this beer	6. I would like to ask and know more about this beer
7. The cold temperature makes me enjoy this beer	8. When I drink this beer I feel that I am in my relaxation moment	9. The more information I have of the beer, the more I enjoy it
10. I found this beer refreshing	11. Drinking this beer takes out my stress	12. I would like to know who produces this beer
13. The most important thing of this beer is the flavor	14. This beer puts me in a sensitive mood	15. I want to know more about this beer
16. I enjoy the sensation on my mouth of this beer	17. When I drink this beer I get excited	18. It could be interesting to know who is the person that makes this beer
19. I enjoy the texture of this beer	20. To take this beer relaxes me, calm me	21. This is a beer to put attention to
22. I enjoy the bitterness of this beer	23. To drink this beer relaxes me	24. Drink this beer leaves me with a sensation of thinking what does it taste like
25. I enjoy the aroma of this beer	26. Drink this beer can help in those moments of tension	27. This beer triggers me more interest
28. To drink this beer is a complete sensory experience	29. I'm in love of this beer	30. This beer triggers me more curiosity
31. The experience of this beer comes from the flavour	32. I feel happy when I drink this beer	33. I found ludic and entertaining to drink this beer
34. Its worthy to take some time to enjoy the beer	35. To drink this beer is like a big pleasant sensation	36. Drinking this beer is physically stimulating
37. I would like to take this beer in a cup to enjoy it more	38. I feel great drinking this beer	39. This is a beer for thought
40. I like beers that are balanced between flavour, aroma and body	41. I would like to share this beer with someone	42. I like to know the style of beer I'm drinking
43. I preferred to drink this style of beer in a special glass, to have a better experience	44. I feel a connection with this beer	45. I want to take a picture of the beer to put it in my beer's list

The analysis of the sensory, affective and cognitive categorization data indicates that almost all phrases were categorized in their correct dimension. For the sensory dimension (Table 2) the Fisher exact test showed that two phrases were attributed a similar number of times to the emotional, sensory and cognitive category (phrase S1 and S16). For the affective dimension, only one phrase was attributed as often to the affective and cognitive dimension (A2). And finally for the cognitive dimension all phrases were attributed by the majority of participants to the cognitive dimension. Only the phrases that were rated above the appropriateness mean score and selected to represent better each dimension were used in the final CATA study. Table 3 shows the final list of six phrases per dimension.

2.4. Conclusion

The results of study one show that consumers are capable of identifying phrases that are both considered as appropriate to rate beers and significantly attributed to a sensory, cognitive or affective dimension. The results also show a high agreement between men and women in the phrases appropriateness judgments. Overall this method was suited to select a set of six phrases per dimension in order to be used in the following study to measure the experience of drinking beer.

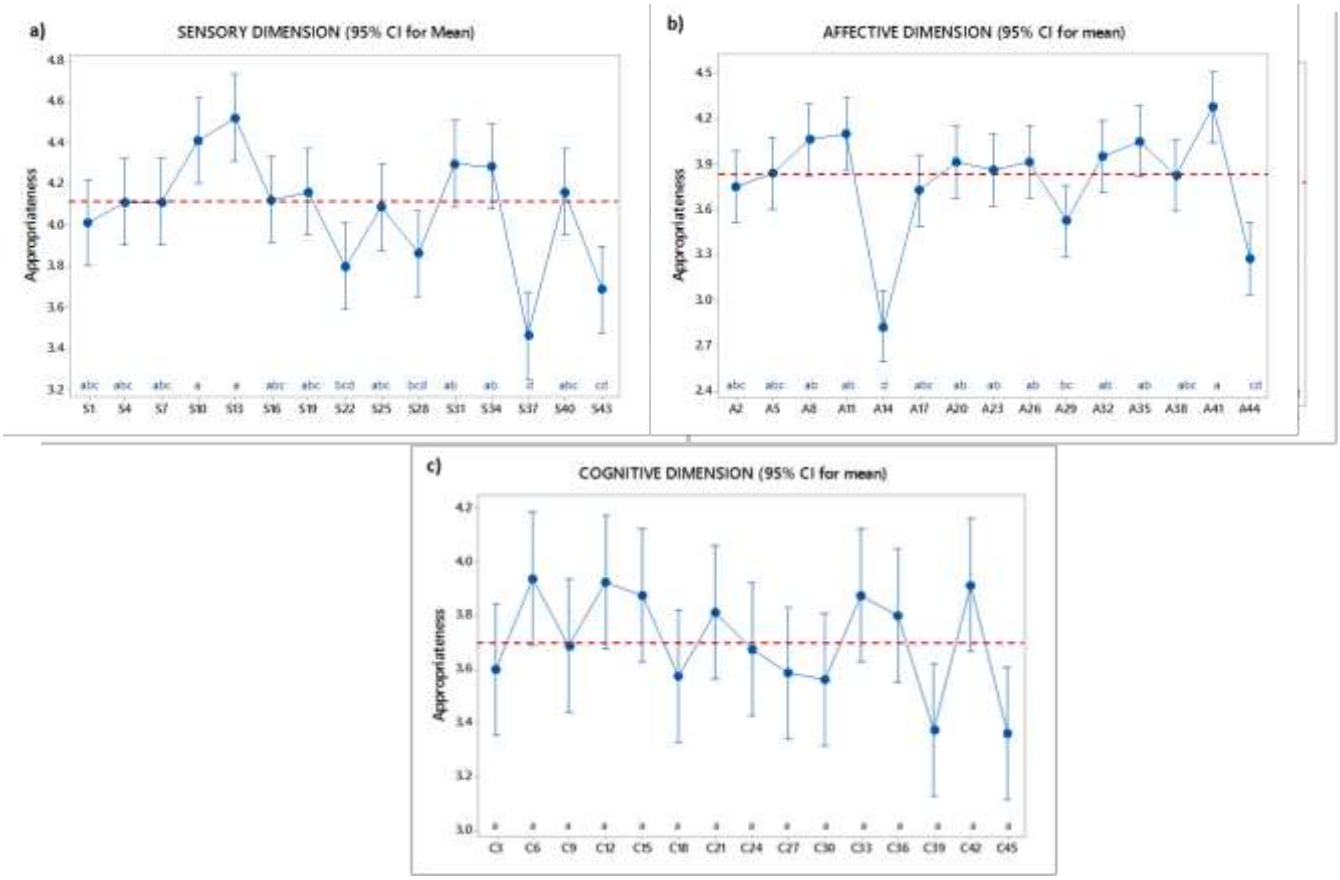

Figure 1. Mean score of phrases appropriateness to describe beers for: a) sensory dimension, b) affective dimension, and c) cognitive dimension. The dotted red line indicates the mean score of all the phrases. Sentences with the same letters were not significantly different (Tukey post hoc test, $\alpha = 0.05$).

3. STUDY 2 – DRINKING EXPERIENCE IN REAL CONTEXT

3.1. Material and methods

A quantitative study was done in a contextual ambient (restaurant) in which beers is usually consumed. A set of four beers (Figure 2) were selected based on a previous study (Gómez-Corona et al 2016) in which industrial beers are commonly divided by consumers as being blond or dark beers.

3.1.1. Participants

Two hundred consumers were recruited in Mexico City at a central location. An intercept sampling procedure was used at affluence points; the interviewers stopped any possible consumer and invited them to participate in the study. The inclusion criteria were: gender (50% men and 50% women), age (20-49 years), and consuming beer at least once a month. Participants who passed the inclusion criteria were invited to take part in the study in a room conditioned for consumer tests. The location in which the study was made is a restaurant-bar in Mexico City which serves beers as part of their regular beverages.

3.1.2. Procedure

Participants evaluated only one beer (out of four) as a pure monadic evaluation. The beers were randomly assigned to the participants, but balanced across genders. At the end of the interviews a total of 50 interviews were completed for each of the four beers. The test was divided in a non-tasting and a tasting step.

In the non-tasting step, the participants had to rate their expected liking on a nine-point hedonic scale and rate their beer experience using a CATA question from the phrases selected from study 1 (Table 3).

Table 2. Sensory, affective and cognitive phrases selected for the final study. Numbers in bold indicate values above the mean frequency.

Phrases	Affective	Cognitive	Sensory	P value
Sensory				
S1. I will take the time to enjoy the beer, smell and taste it	35a%	31.2a%	33.8a%	>0.5
S4. I enjoy this beer will all my senses	42.5a%	23.8b%	33.8ab%	0.018
S7. The cold temperature makes me enjoy this beer	27.5a%	27.5a%	45b%	0.032
S10. I found this beer refreshing	25a%	33.8ab%	41.2b%	0.043
S13. The most important thing of this beer is the flavour	26.2a%	30ab%	43.8b%	0.031
S16. I enjoy the sensation on my mouth of this beer	28.7a%	32.5a%	38.8a%	>0.5
S19. I enjoy the texture of this beer	23.8a%	32.5ab%	43.8b%	0.012
S22. I enjoy the bitterness of this beer	20a%	32.5ab%	47.5b%	0.000
S25. I enjoy the aroma of this beer	28.7a%	25a%	46.2b%	0.003
S28. To drink this beer is a complete sensory experience	25a%	25a%	50b%	0.002
S31. The experience of this beer comes from the flavour	27.5a%	21.2a%	51.2b%	0.003
S34. Its worthy to take some time to enjoy the beer	33.8a%	17.5b%	48.8a%	0.007
S37. I would like to take this beer in a cup to enjoy it more	20a%	23.8a%	56.2b%	0.000
S40. I like beers that are balanced between flavour, aroma and body	18.8a%	31.2b%	50b%	0.000
S43. I preferred to drink this style of beer in a special glass, to have a better experience	25a%	27.5a%	47.5b%	0.005
Affective				
A2. Find something unexpected in the beer surprises me	40a%	33.8ab%	26.2b%	0.032
A5. I fill calmed when I drink this beer	56.2a%	30b%	13.8c%	0.001
A8. When I drink this beer I feel that I am in my relaxation moment	53.8a%	26.2b%	20b%	0.001
A11. Drinking this beer takes out my stress	50a%	25b%	25b%	0.002
A14. This beer puts me in a sensitive mood	57.5a%	23.8b%	18.8b%	0.000
A17. When I drink this beer I get excited	71.2a%	20b%	8.8c%	0.000
A20. To take this beer relaxes me, calm me	58.8a%	25b%	16.2c%	0.000
A23. To drink this beer relaxes me	62.5a%	23.8b%	13.8b%	0.000
A26. Drink this beer can help in those moments of tension	58.8a%	30b%	11.2c%	0.000
A29. I'm in love of this beer	60a%	27.5b%	12.5c%	0.000
A32. I feel happy when I drink this beer	50a%	30b%	20b%	0.000
A35. To drink this beer is like a big pleasant sensation	66.2a%	22.5b%	11.2b%	0.000
A38. I feel great drinking this beer	60a%	26.2b%	13.8c%	0.000
A41. I would like to share this beer with someone	58.80%	22.50%	18.80%	0.000
A44. I feel a connection with this beer	62.5a%	23.8b%	13.8b%	0.000
Cognitive				
C3. I like to read the label of this beer	13.8a%	71.2b%	15a%	0.000
C6. I would like to ask and know more about this beer	16.2a%	63.7b%	20a%	0.000
C9. The more information I have of the beer, the more I enjoy it	18.8a%	70b%	11.2a%	0.000
C12. I would like to know who produces this beer	10a%	81.2b%	8.8a%	0.000
C15. I want to know more about this beer	17.5a%	70b%	12.5a%	0.000
C18. It could be interesting to know who is the person that makes this beer	20a%	70b%	10a%	0.000
C21. This is a beer to put attention to	15a%	65b%	20a%	0.000
C24. Drink this beer leaves me with a sensation of thinking what does it taste like	22.5a%	58.8b%	18.8a%	0.000
C27. This beer triggers me more interest	17.5a%	65b%	17.5a%	0.000
C30. This beer triggers me more curiosity	22.5a%	70b%	7.5c%	0.000
C33. I found ludic and entertaining to drink this beer	13.8a%	76.2b%	10a%	0.000
C36. Drinking this beer is physically stimulating	15a%	70b%	15a%	0.000
C39. This is a beer for thought	15a%	76.2b%	8.8a%	0.000
C42. I like to know the style of beer I'm drinking	7.5a%	86.2b%	6.2a%	0.000
C45. I want to take a picture of the beer to put it in my beer's list	15a%	75b%	10a%	0.000

Group 1 Blond-industrial		Corona Industrial American lager 4.6% Alc. Vol. Mexico 355 mL 0.7 €		Pacífico Industrial American lager 4.8% Alc. Vol. Mexico 325 mL 0.7 €
Group 2 Dark-industrial		Victoria Industrial Vienna lager 4% Alc. Vol. Mexico 355 mL 0.6 €		Bohemia Obscura Industrial Vienna lager 5.5% Alc. Vol. Mexico 355 mL 0.9 €

Figure 2. Image and basic information of the set of beers used in the study: commercial name (*e.g.* Corona), type (*e.g.* industrial), style (*e.g.* American lager), percent of alcohol volume (*e.g.* 4.6%), country of origin (*e.g.* Mexico), milliliters in the bottle (*e.g.* 355 mL), and local price (Mexico City, 2016) in euros.

Table 3. Set of phrases used in the CATA question separated by sensory, affective and cognitive dimension.

Sensory dimension	Affective dimension	Cognitive dimension
The most important thing of this beer is the flavour	I would like to share this beer with someone close to me	I like to know the style of the beer that I am drinking
The experience of this beer comes from its flavour	Drink this beer is like a big sensation of pleasure	I would like to know who produces this beer
Its worthy to take some time to enjoy this beer	Drink this beer relaxes me, calm me	I found ludic and enter- taining to drink this beer
I like beers like this, that are balanced between flavour, aroma and body	Drink this beer can help in those moments of tension	This is a beer for thought
What makes me enjoy this beer is its cold temperature	This beer changes my mood	I would like to take a picture of this beer to remember it
I enjoy the aroma of the beer	I feel great drinking this beer	I like to read the label of this beer

In the tasting condition, participants were given a glass and a beer opener. They were instructed to open the beer and drink it (directly from the bottle or in the glass, as they wished). They were asked to take their time to drink the beer as they usually drink it and to rate their overall liking on a 9-point hedonic scale and their experience when drinking the beer with the same CATA question as in the non-tasting step. Once they finished, they were asked to call the interviewer which checked that the questionnaire was completed. Participants were thanked for their participation but they were not paid.

3.2. Data analysis

The questions with a scale for the non-tasting and the tasting condition were analyzed using a one-way ANOVA to explore the differences across products and variables. A two-way ANOVA was also used to see the differences across gender and age. Whenever a p value smaller than 0.05 was obtained, a Tukey multiple comparison test was performed. All analyses were performed on Minitab software (version 16.1.0, Minitab Inc., State College, USA). The CATA frequency data were analyzed with a Z-test for proportion.

3.3. Results

3.3.1. Liking results

The ANOVA showed no significant difference between beers in expected liking in both the non tasting and the tasting conditions. In the non-tasting condition, the liking scores were 7.2 for Pacífico, 7.1 for Bohemia Oscura, 7.0 for Victoria and 6.7 for Corona. In the tasting condition, the liking scores were 7.5 for Pacífico, 7.4 for Bohemia Oscura, 7.3 for Victoria and 7.1 for Corona.

Table 4. Contingency table of the frequencies for each dimension and beer. Letters indicate the significant differences across beers using a Z-test for proportions.

	Corona	Pacífico	Victoria	Bohemia Oscura
Non tasting				
Sensory	101 a	115 ab	**129 b**	111 ab
Affective	**100 a**	74 b	83 ab	61 b
Cognitive	54 a	37 ab	29 b	47 a
Tasting				
Sensory	101 a	**137 b**	**128 b**	**135 b**
Affective	**92 a**	**88 a**	**96 a**	67 b
Cognitive	48 a	29 b	38 ab	18 b

3.3.2. CATA (dimensions) results

The CATA phrases were separated by dimension: sensory, affective and cognitive. The results show a higher frequency of sensory dimension in both the non-tasting and tasting conditions. In the non-tasting condition, the beers Victoria and Bohemia Oscura had significantly more phrases selected for the sensory dimensions. The affective dimension was dominant for Corona and Victoria. The cognitive dimension was also higher in Corona and Bohemia Oscura. In the tasting condition, all the beers expect Corona had a higher frequency of phrases selected. For the affective dimension no difference was observed except for Bohemia Oscura which had significantly lower frequencies. And finally in the cognitive dimension for the tasting condition a low frequency was observed for all beers.

4. DISCUSSION

Based on the results, our study helps to identify the experience of drinking beer and is capable of measuring the influence of affects, senses and cognition in the interaction with the product, both in a non-tasting and tasting condition. In this framework, the study help address the gap in the product experience research by showing two important things.

The first one is that expected and overall liking variables can be less discriminant than we think. Products with similar liking were associated to different variables such as sensory, affective and cognitive. And second, these variables can explain the way we interact with products and more specifically the experience of drinking beer. Purchases do not come stamped as "experiences" or "possessions". Instead, it is the set of psychological processes that tend to be invoked by experiences and material goods that determine how much satisfaction they provide (Gilovich, Kumar, & Jampol, 2015).

The idea of having a sensory, affective or cognitive experience is not new. In a previous research with a set of 12 material and food products, Gentile, Spiller, & Noci (2007) used a factor analysis to group the dimensions of the experiential consumption. The underlining dimensions were considered as: sensorial, emotional, cognitive, pragmatic, lifestyle and relational. The results of the factor analysis showed that each product loaded on both pure components (that is, factors that can be related to a single experiential component) and "mixed components" (that is, factors whose variables belong to different experiential components). Mixed components can be considered as a cue for the hypothesized existence of interrelations between components, which in turn stand for complex experiences. Complex experiences emerge as a specific case in which the components are so intimately intermingled that consumers are unable to draw any separation between them. In agreement with Gentile, Spiller & Noci (2007) we found that the beer drinking experience can be described both in terms of pure components and mixed components.

5. CONCLUSION

Our study helped addresses the gap in the experience research. We propose that drinking experience can be better understood by taking into consideration three dimensions: sensory, affective and cognitive. One variable or a mix of them can be

more salient during the product interaction, and therefore we can differentiate the products based on these salient dimensions. The results show that while acceptability may be similar between products, the sensory, cognitive or affective experience can be different. Therefore, products with similar liking can be designed to have a salient dimension, according to the benefits in which we want to position a product in the market.

The methodology proposed was helpful to obtain the phrases for the CATA question (in study 1) and CATA question was also a useful way to explore the salient dimension before and during product consumption. Different types of analysis can be performed with the frequency data such as multivariate techniques like correspondence analysis or multiple factor analysis for contingency tables. These types of analysis can be very useful to take into consideration all of the phrases used in the study to access the experience of drinking beer.

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