



Pleasantness, emotions and perceptions induced by coffee beverage experience depend on the consumption motivation (hedonic or utilitarian)



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ABSTRACT

Motivations to consume a given food or drink differ across consumers. For instance, coffee drinking can be motivated by sensory enjoyment (hedonic motivation) or by stimulation (functional motivation). Today it remains unknown how hedonic vs. utilitarian motivations impact consumer–product interaction. The objective of the present research was to study the impact of both motivations on consumer responses (i.e. pleasantness, emotions, and importance and satisfaction for each of the five senses) during the entire experience of a coffee beverage. Sixty participants drinking coffee beverage either for sensory enjoyment (SENS, $n = 30$) or to be stimulated (STIM, $n = 30$) were recruited. Four moments of the product experience were considered: water heating, jar handling, cup preparation and cup drinking. Self-ratings were repeatedly performed by the participants after each moment. SENS participants depicted higher positive emotions than STIM participants and even if similar levels of pleasantness were reached after cup drinking by both groups, levels of pleasantness at water heating and jar handling moments differed. The importance and satisfaction for the different senses also changed according to the participant motivation to drink the coffee beverage. Marketing implications are discussed in terms of communication materials development to more strongly engage consumers with the product.

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1. Introduction

A given food or beverage can be consumed according to different motivations by different people or on different occasions. In USA, soya consumers are segmented across the population according to health or taste motivations (Wansink & Westgren, 2003). Similarly, consumption of coffee is driven by different motivations such as the sensory enjoyment provided by coffee flavour and the psychophysical stimulation induced by caffeine (Hsu & Hung, 2005). Coffee is a source of satisfaction through smell and taste experience and of stimulation as an experienced consequence of coffee drinking (Desmet & Schifferstein, 2008). Coffee can be considered as an hedonic good when consumer satisfaction is related to the multisensory experience and as an utilitarian good when consumers expect a consequence after consumption, i.e. stimulation (Batra & Ahtola, 1990). Coffee drinking is also an emotional experience with elicited emotions varying according to the sensory properties of the coffees (Bhumiratana, Adhikari, & Chambers, 2014).

The impact of utilitarian vs. hedonic motivations on consumer behaviour is widely documented in marketing literature for instance on shopping attitudes (Childers, Carr, Peck, & Carson, 2001; Kim, 2006; O'Brien, 2010; Sarkar, 2011). However, considering food and beverage categories post-purchase (i.e. consumption), only one study showed that food consumers' choice is more hedonic (e.g. a chocolate bar) rather than utilitarian (e.g. an apple) driven (Cramer & Antonides, 2011). However, it remains unclear whether different hedonic vs. utilitarian motivations can impact pleasantness, sensory perception and emotions elicited by product interaction during the entire experience.

We compared pleasantness and emotional responses induced by the preparation and consumption of a cup of coffee beverage between two groups of participants, one consuming this product to be stimulated (utilitarian motivation), the other for sensory enjoyment (hedonic motivation). Since coffee experience is likely associated to both stimulation and sensory enjoyment through repeated coffee exposure in our daily life (for a review on associative learning, see Mittchell, De Houwer, and Lovibond (2009)), we used a motivation questionnaire to recruit regular caffeinated coffee consumers for whom consumption is specifically motivated either by being stimulated or by sensory enjoyment.

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Following an existing approach (Schifferstein, 2006), we also measured the perceived importance that participants attribute to the five sensory modalities (vision, hearing, touch, taste, smell) in the context of their product experience as well as their satisfaction provided by the sensory stimulations generated by each sense.

We developed an approach to measure consumer response in a realistic environment (kitchen) not only after cup drinking but also at four other moments of the product experience (before starting the experience as baseline, after water heating, jar handling and cup preparation). Usually participant's response is collected at the end point of the experiment however sensory modalities play an important role during the experience and emotional responses can change according to the various moments of user–product interactions (Schifferstein, Fenko, Desmet, Labbe, & Martin, 2013).

Our overall objective was to measure the impact of different motivations for drinking coffee beverage on the dynamic of consumer response during the entire experience with the hypothesis that utilitarian vs. hedonic motivations impacts differently level of pleasantness, emotions and also sensory responses. Indeed participants consuming a cup of coffee beverage for sensory enjoyment could attribute more importance to coffee smell and/or taste than participants drinking a cup of coffee beverage to be stimulated.

We chose coffee beverage to fulfil our objective because it is associated to two main drinking motivations (sensory enjoyment and stimulation), and because of its impact on consumer emotions. In addition, as it is one of the most popular beverage worldwide insights about the impact of motivations on emotions and sensory perception related to coffee experience could have valuable marketing implications related to brand experience design (Brakus, Schmitt, & Zarantonello, 2009; Krishna, 2012; Lindstrom, 2005).

2. Material and methods

2.1. Product and participants

A commercial coffee beverage was selected for the study and 60 Swiss participants from Lausanne and the surroundings (30 men and 30 women, from 18 to 60 years old) highly representative of the consumer target of interest were recruited. Indeed, they all consumed every day and exclusively this specific product either for stimulation (utilitarian motivation) or for sensory enjoyment (hedonic motivation). Participants were assigned to the STIM group ($n = 30$, 50/50 male–female, mean age 34.5) and to the SENS group ($n = 30$, 50/50 male–female, mean age 35.7), respectively. The sample size, $n = 30$ per group, has been established based on the results of the 2nd pilot study, with the aim to have sufficient power (80%) to declare a difference of 0.3 points (i.e. practically relevant difference) on pleasantness as statistically significant ($\alpha = 5\%$).

Assignment to one of both groups was conducted through a motivation questionnaire containing 30 statements associated to either sensory enjoyment or stimulation (e.g. “I drink coffee beverage to stay awake” is a statement associated to stimulation motivation). For each statement, they rated a four-point agreement scale

(1. Not at all important, 2. unimportant, 3. important, 4. very important). Scores were averaged across statements within each motivation category and if significantly different they were included in the motivation category with the higher score. If not, participants were not eligible for the study. This questionnaire has been built based on outcomes of previous qualitative and quantitative research performed with the same consumer target to better understand motivations for coffee consumption and is used internally in routine. The questionnaire, which has not been published because of confidentiality issue, is specific to the described consumer target. However, several methodologies exist and can be used to identify consumer motivations (Deliza, Macfie, & Hedderley, 1999; Steptoe, Pollard, & Wardle, 1995).

Participants were not caffeine deprived since we aimed at measuring the impact of associated motivations to coffee on consumer response and not to compare the acute effect of caffeine on consumer response according to their motivation.

All participants gave their written consent and received an incentive for their participation.

2.2. Self-report questionnaire

A questionnaire was developed to measure the consumer response on the following items: pleasantness, emotions, the perceived importance of the five sensory modalities (vision, hearing, touch, taste, smell) and the satisfaction for the sensory stimulation from each of the sensory modalities. To assess the emotional state, a product- and context- specific list of 39 emotions was built based on an internal prior qualitative study where we asked coffee beverage users to describe their emotional state after the product consumption. In the present study, all ratings were performed on 10-cm unstructured linear scales, anchored at the extremities. Definitions and anchors for each response are recorded in Table 1. Data acquisition was carried out on a laptop with Fizz sensory software version 2.47B (Biosystemes., 1990).

2.3. Research protocol

The test was performed at the Nestlé Research Center (Lausanne, Switzerland) in a kitchen of our Consumer Research Space with standard kitchen appliances and a table to set up a familiar environment. Participants were asked to prepare their cup of coffee beverage as they would usually do by adding their habitual amount of instant coffee and water, and then to drink it. They were aware that the experimenter would ask them to complete questionnaires several times during the experience.

Participants rated as baseline (moment 0) a first questionnaire including pleasantness and emotions. After each of the four moments described below they were then interrupted by the experimenter and asked to rate a questionnaire including pleasantness, emotions and sensory modalities (taste satisfaction was rated after cup drinking moment only):

- Water heating (moment 1): heating of bottled or tap water using a pan or a boiler or a micro-wave oven and during water heating. This moment lasted on average 320 s.

Table 1
Definition and scale anchors of the responses.

Response	Definition	Scale anchors
Pleasantness	How much do you appreciate the experience at this moment of your experience?	“not at all pleasant” to “very pleasant”
Emotions	To what extent do you feel each emotion at this moment of your experience?	“not at all” to “very much”
Sensory modality importance	How important the following sensory modalities are at this moment of your experience?	“not at all important” to “very important”
Sensory modality satisfaction	How satisfying the following sensory stimulation from each of the sensory modality at this moment of your experience?	“not at all satisfied” to “very satisfied”

- Jar handling (moment 2): handling and opening of the coffee jar consisting in removing the plastic cap and the aluminium lid. This moment lasted on average 230 s.
- Cup preparation (moment 3): mixing in the cup of the instant coffee taken from the jar with heated water, participant could add sugar and/or milk according to their consumption habits but not drink the beverage yet. This moment lasted on average 270 s.
- Cup drinking (moment 4): entirely or partially drinking of coffee beverage from the cup. This moment lasted on average 630 s.

Those moments listed were considered as they were shared across 40 participants during a first pilot-study performed in the same environment as described above. In a second pilot study we validated that interrupting participants during product experience to complete a questionnaire did not impact pleasantness and emotions felt at the end of the experience (data not shown).

2.4. Statistical analyses

Hierarchical clustering (raw data, Euclidean distance, complete linkage) allowed to cluster the 39 emotions into 14 key emotional dimensions (i.e. emotions that were consistently scored similarly were grouped in the same emotional dimension). The scores of emotions belonging to the same dimension were averaged and the resulting average dimensions were given an English label that best summarizes the semantics of the French labelled emotions.

Pleasantness, emotional dimensions, sensory importance and satisfaction items were all analysed univariately using a mixed model ANOVA with motivations (STIM, SENS) and moments (moments 0, 1, 2, 3, 4) as fixed factors and participants as nested in motivation factor (Neter, Kutner, Wassermann, & Nachtsheim, 1996). Mean trajectories of STIM and SENS groups over the 4

moments are visualized using line charts with confidence intervals corresponding to $M \pm \frac{1}{2}\text{LSD}$ (Fisher's Least Significant Difference, $\alpha = 5\%$, interaction motivation \times moments). This descriptive visualization allows for simple pairwise comparisons (i.e. not significantly different if intervals are overlapping). As a complement to this visualization of effects, ANOVA F -ratio with P -value and Cohen's d effect size for each factor were computed. Cohen's d effect size allowed to interpret the effect of the factors as “small” (0.2), “medium” (0.5) or “large” (0.8) (Cohen, 1977).

Mean trajectories were further described using multivariate analyses as proposed in Lenfant, Loret, Pineau, Hartmann, and Martin (2009) to assess the dynamics of perception. Principal Component Analysis (PCA) on emotional dimensions allowed generating a biplot that visualizes the trajectories of STIM and SENS groups on a multivariate emotion map.

The data were analysed using the NCSS statistical software package (Hintze, 2001).

3. Results

3.1. Impact of motivation on pleasantness

The dynamic of pleasantness rating along the experience was significantly impacted by motivations [$F(1,290) = 2.93$, $P < 0.00$, $d = 0.34$] and moments [$F(4,290) = 9.0$, $P < 0.00$, $d = 0.55$] without significant interaction between both factors (Fig. 1). Both groups started with similar pleasantness ratings at baseline (MSTIM = 7.2, MSENS = 7.3, LSD = 0.8) and ended with similarly increased ratings after cup drinking (MSTIM = 9.0, MSENS = 9.2, LSD = 0.8), but along the experience (water heating, jar handling, cup preparation), pleasantness was consistently scored higher in the SENS group. In the SENS group, pleasantness continuously increased over the experience, indicating that all moments of the experience were increasingly enjoyable. In the STIM group,

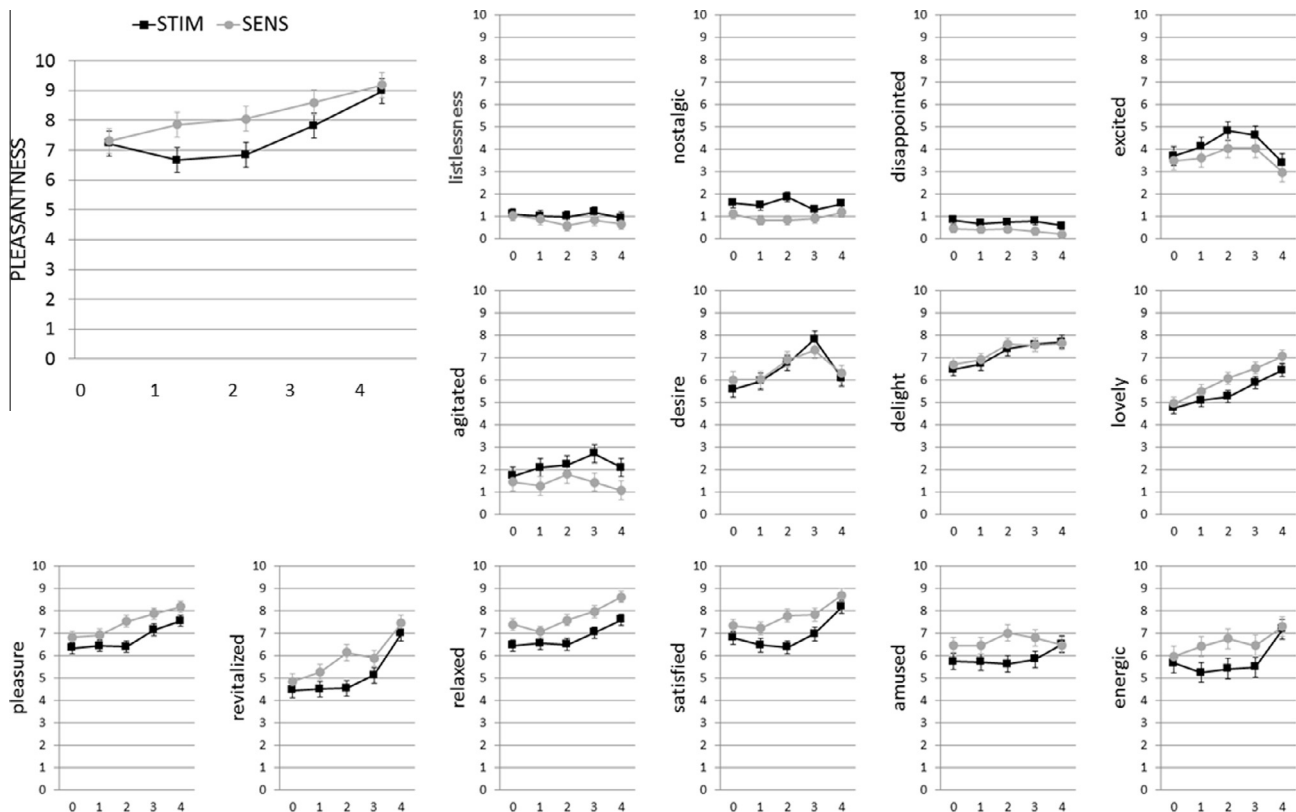


Fig. 1. Mean scores (\pm confident interval) of STIM (—) and SENS groups (—) for pleasantness and emotions at each moment of the experience (0, 1, 2, 3, 4).

pleasantness only increased for cup preparation and cup drinking, indicating that water heating and jar handling were less enjoyable moments of the experience.

3.2. Impact of motivation on emotions

The emotional map (Fig. 2) represents the emotional pathway during the entire coffee experience expressed by both groups of participants (STIM or SENS). 74% of the information on emotions is visualized on this map. The horizontal axis accounts for 56% and separates emotions related to low arousal (e.g. listlessness), negative valence (e.g. disappointed) on the left from emotions related to high arousal (e.g. revitalized) and positive valence (e.g. satisfied) on the right. The vertical axis accounts for 18% and mainly represents excitement (excited, agitated, desire). Overall, for both groups, the product emotional experience started from the bottom left quadrant of the map (emotions related to low arousal and negative valence) and finished on the right side of the map (emotions related to high arousal and positive valence). However the pathway changed according to the group. The STIM group showed high excitement after jar handling (moment 2) and after cup preparation (moment 3) and then emotions related to high arousal and positive valence after cup drinking (moment 4). For the SENS group, the product experience induced high arousal and positive valence emotions from jar handling (moment 2) until cup drinking (moment 4) with less excitement.

Univariate visualizations of STIM and SENS mean scores for each emotion and at each moment of the coffee beverage experience (Fig. 1) complement the holistic description provided by the emotional map (Fig. 2). For each emotion, ANOVA F -ratio with P -value and Cohen's d effect size for motivation and moment factors are reported in Table 2. Except for listlessness, motivations and/or moments significantly impacted emotion scores without significant interactions between motivation and moment factors for all emotions and with overall an effect size between “small” (0.2)

Table 2

ANOVA F -ratio with P -value and Cohen's d effect size values for each factor of the mixed model ANOVA performed on each emotion.

	Motivation		Moment	
	$F(1,290)$	d	$F(4,290)$	d
Agitated	7.5, $P < 0.00$	0.31	0.6, $P = 0.66$	0.14
Disappointed	13.7, $P < 0.00$	0.43	0.7, $P = 0.60$	0.15
Nostalgic	15.4, $P < 0.00$	0.45	0.6, $P = 0.68$	0.14
Lassitude	1.8, $P = 0.18$	0.15	0.4, $P = 0.81$	0.11
Excited	4.0, $P = 0.04$	0.23	2.8, $P = 0.02$	0.30
Satisfied	15.0, $P < 0.00$	0.45	7.2, $P < 0.00$	0.49
Pleasure	10.5, $P < 0.00$	0.37	5.4, $P < 0.00$	0.43
Energetic	7.4, $P < 0.00$	0.31	3.4, $P < 0.00$	0.34
Delight	0.3, $P = 0.59$	0.06	4.3, $P < 0.00$	0.38
Amused	9.2, $P < 0.00$	0.35	0.4, $P = 0.81$	0.11
Desire	0.1, $P = 0.78$	0.04	5.3, $P < 0.00$	0.42
Revitalized	7.4, $P < 0.00$	0.31	9.7, $P < 0.00$	0.57
Relaxed	20.4, $P < 0.00$	0.52	5.8, $P < 0.00$	0.44
Lovely	4.1, $P = 0.04$	0.23	6.1, $P < 0.00$	0.45

and “medium” (0.5). The univariate figures are sorted according to the order observed on the emotional map. Overall, nostalgic and disappointed emotions are consistently scored low (<2) over the experience and consistently significantly higher in the STIM group than in the SENS group. Excited emotion is scored similarly in both groups at baseline whereas significantly increased over the experience and come back to baseline after cup drinking. Overall, excited as well as agitated were scored significantly higher for the STIM than for the SENS group.

The emotions on the right side of the map related to positive valence (delight, lovely, pleasure, satisfied) and to high arousal (revitalized, energetic) significantly increased over the experience for both groups with a baseline and final level (after cup drinking) generally comparable between STIM and SENS groups. However over the entire experience, these emotions are scored significantly higher in the SENS than in the STIM group except for delight emotion score which did not significantly differ between both groups.

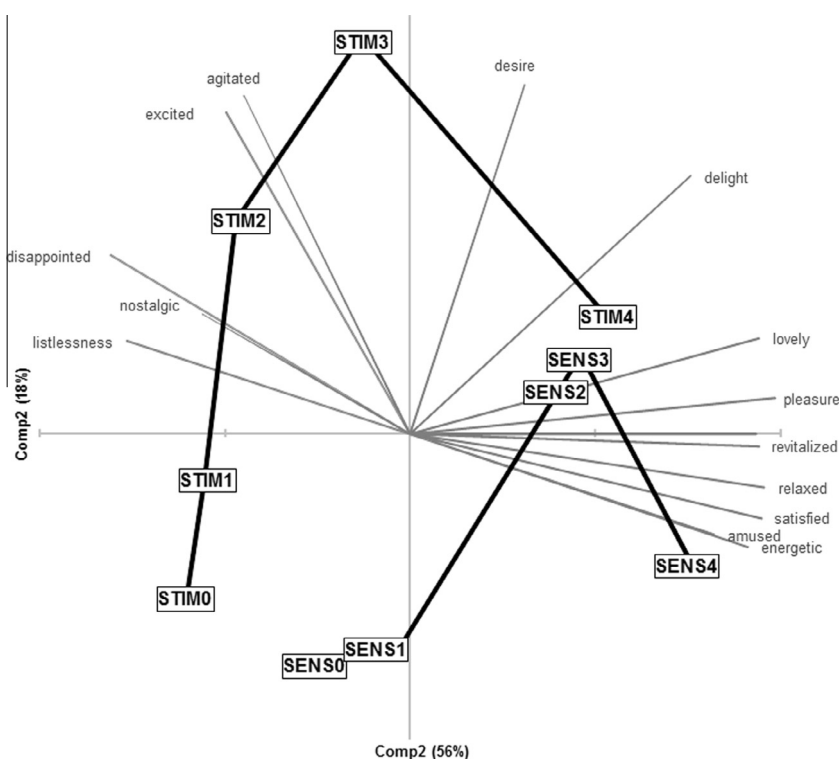


Fig. 2. Principal component (PC) analysis biplot (PC1 and PC2) representing the emotions as variables and the product/group (STIM and SENS) pairs at each moment of the experience (0, 1, 2, 3, 4) as observations.

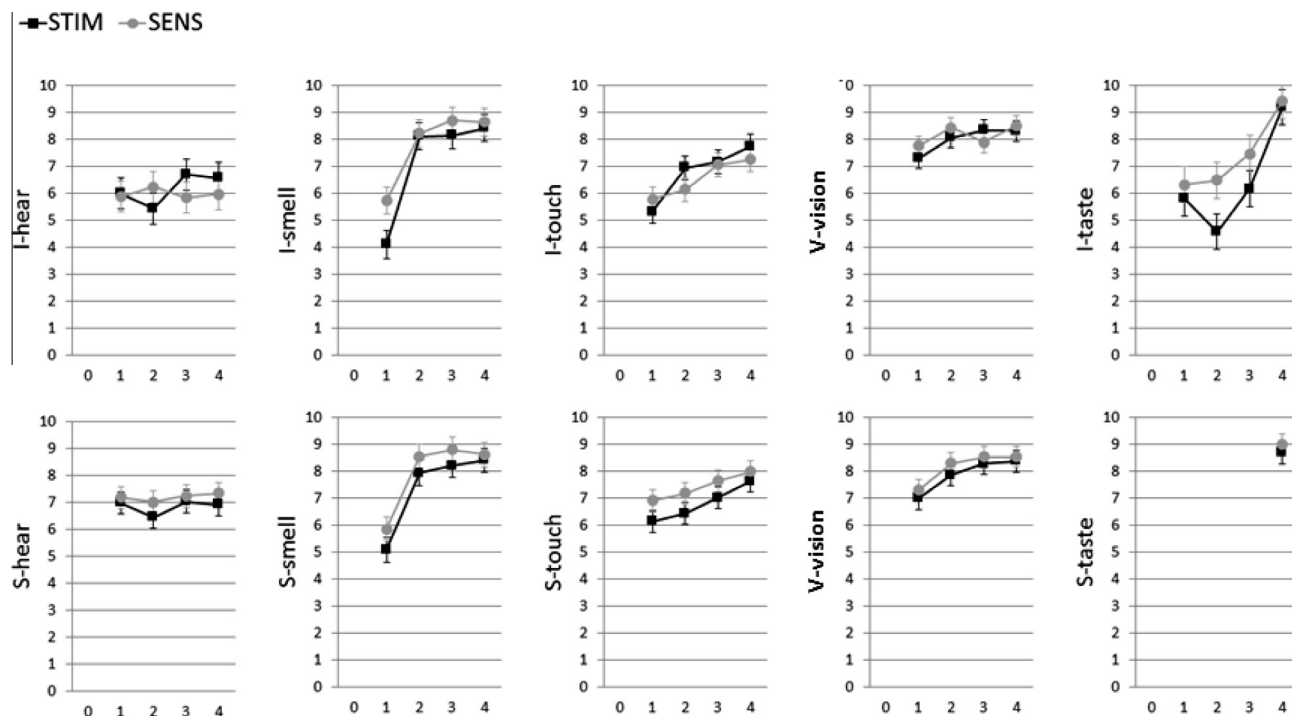


Fig. 3. Mean scores (\pm confident interval) of STIM (—■—) and SENS groups (—●—) for sensory importance (I) and satisfaction (S) items at each moment of the experience (0, 1, 2, 3, 4).

3.3. Impact of motivation on perceived sensory modalities

For each sensory modality, importance and satisfaction mean scores for STIM and SENS groups at each moment of the coffee beverage experience are represented in Fig. 3 with ANOVA F -ratio with P -value and Cohen's d effect size for motivation and moment factors reported in Table 3. As observed for emotions, no interactions between both factors were significant and when significant the effect size was between “small” (0.2) and “medium” (0.5) except for the effect of moment factor which was “large” (above 0.5) on smell (importance and satisfaction) and taste importance. Among the five sensory modalities, motivations significantly impacted the perceived importance of smell (moment 1) and taste (moments 2 and 3) during product experience which were both significantly rated higher by participants from SENS group. The satisfaction of participants for the sensory stimulation from each modality was rated in overall significantly higher for smell by SENS group. For both groups combined, we can also observe that importance and satisfaction for vision were highly rated during the entire experience (between 7 and 9) whereas smell and touch (importance and satisfaction) and taste (importance) were rated lower at the

beginning of the experience and then progressively increased. Among the five senses and moments, taste importance reached the highest level of intensity after cup drinking and was similar to taste satisfaction (above 9). A Paired t -test (two-tailed) revealed no significant differences in taste satisfaction between SENS and STIM groups [$t(29) = 0.45$]. Finally hearing intensity (importance and satisfaction) remained moderate and stable during the entire experience for both groups of participants.

4. Discussion

Our findings demonstrated that pleasantness and emotions felt during consumer–coffee beverage interaction differ according to motivations of participants for this product. In addition, perceived importance of smell and taste and how satisfying the sensory experience were also impacted. Pleasantness and emotion levels varied according to the different moments of the experience confirming findings obtained by Schifferstein et al. (2013) in a dehydrated soup experience context. In addition this dynamic of pleasantness and emotions during the entire experience was also impacted by the type of motivation.

When significant, the effect size of motivation and moment factors on measured variables varied from “small” to “medium” except for the effect of moment on smell (importance and satisfaction) and taste importance which was “large” according to Cohen's interpretation (Cohen, 1977). Such interpretation needs to be taken carefully and additional studies in the field of motivational impact on product perception are required before being able to conclude that an effect is “small”, “medium” or “large” according to its practical significance.

Overall, participants drinking a coffee beverage to be stimulated found the experience less pleasant and rated emotions related to positive valence and high arousal lower than participants drinking a coffee beverage for sensory enjoyment. However, after cup drinking, the level of pleasantness and their emotional state rejoined those of participants motivated by sensory enjoyment. In addition,

Table 3
ANOVA F -ratio with P -value and Cohen's d effect size values for each factor of the mixed model ANOVA performed on importance and satisfaction for each sensory modality.

	Motivation		Moment	
	$F(1,232)$	d	$F(3,232)$	d
Hear-importance	0.2, $P = 0.63$	0.06	0.2, $P = 0.47$	0.08
Smell-importance	3.8, $P = 0.05$	0.25	29.6, $P < 0.00$	1.00
Touch-importance	0.4, $P = 0.54$	0.08	4.7, $P < 0.00$	0.40
Vision-importance	0.29, $P = 0.59$	0.07	2.18, $P = 0.1$	0.27
Taste-importance	5.62, $P = 0.02$	0.31	15.9, $P < 0.00$	0.73
Hear-satisfaction	1.1, $P = 0.30$	0.14	0.3, $P = 0.8$	0.10
Smell-satisfaction	3.53, $P = 0.05$	0.24	25.3, $P < 0.00$	0.92
Touch-satisfaction	3.12, $P = 0.08$	0.22	2.5, $P = 0.06$	0.30
Vision-satisfaction	1.19, $P = 0.27$	0.14	5.2, $P < 0.00$	0.42

as hypothesized, importance and satisfaction for smell and taste modalities were higher for participants motivated by sensory enjoyment.

Evidently, participants drinking coffee beverages for sensory enjoyment appreciate the entire experience, not only the drinking moment, and address more importance to the sensory experience. But participants drinking coffee beverages for stimulation seem to consider the experience as functional, i.e. driven by caffeine absorption to obtain the expected mental energy boost, with cup drinking as the key moment. Consistent with this previous assumption, the higher level of excitement and lower level for emotions related to high arousal observed before cup drinking could be explain by their need for stimulation. We demonstrated that hedonic and utilitarian motivations in a food context are associated to sensory experience and to consequences after consumption, respectively. Overall, the dynamic of sensory importance, as shown by Schifferstein et al. (2013), and satisfaction during the entire experience also differed between senses. As expected, smell and taste are key during cup preparation and drinking whereas vision played a key role all along the entire product experience.

Finally, we validated that different types of motivations for a coffee beverage impacted the pleasantness of the experience, the participant's emotional status and sensory perceptions.

5. Implication for future research

More generally, such findings are critical since they suggest that consumption motivation should be considered and controlled when performing consumer research on food or beverage because of its impact on consumer response. Consequently, identifying the motivations of a consumer target of interest for consuming a product using for instance methodologies described by Steptoe et al. (1995) or Deliza et al. (1999) is strongly recommended to be able then to recruit consumers and analyze their responses according to their motivation.

In addition, from a marketing perspective, campaign materials and social media should reflect the emotions, sensory modalities and moments of the experience which are appropriate according to respective consumer motivations to strongly engage them with the product. Both segments can be addressed through the use of imagery and dialogue reflecting both the functional and emotional benefits derived through the phases of preparation and consumption.

References

- Batra, R., & Ahtola, O. T. (1990). Measuring the hedonic and utilitarian sources of consumer attitudes. *Marketing Letters*, 2, 159–170.
- Bhumiratana, N., Adhikari, K., & Chambers, E. IV. (2014). The development of an emotion lexicon for the coffee drinking experience. *Food Research International*, 61, 83–92.
- Biosystemes. (1990). FIZZ: Logiciel de gestion de l'analyse sensorielle et des tests consommateurs. Couternon, France.
- Brakus, J. J., Schmitt, B. H., & Zarantonello, L. (2009). Brand experience: What is it? How is it measured? Does it affect loyalty? *Journal of Marketing*, 73, 52–68.
- Childers, T. L., Carr, C. L., Peck, J., & Carson, S. (2001). Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of Retailing*, 77, 511–535.
- Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. Routledge.
- Cramer, L., & Antonides, G. (2011). Endowment effects for hedonic and utilitarian food products. *Food Quality and Preference*, 22, 3–10.
- Deliza, R., Macfie, H., & Hedderley, D. (1999). An investigation using the repertory grid and focus group methods of the package features affecting consumer perception of fruit juice. *Brazilian Journal of Food Technology*, 2, 63–71.
- Desmet, P. M. A., & Schifferstein, H. N. J. (2008). Sources of positive and negative emotions in food experience. *Appetite*, 50, 290–301.
- Hintze, J. L. (2001). Number Cruncher statistical systems, Kaysville, Utah. 1-1-2001.
- Hsu, J. L., & Hung, W.-C. (2005). Packed coffee drink consumption and product attribute preferences of young adults in Taiwan. *Food Quality and Preference*, 16, 361–367.
- Kim, H.-S. (2006). Using hedonic and utilitarian shopping motivations to profile inner city consumers. *Journal of Shopping Center Research*, 13, 57–79.
- Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. *Journal of Consumer Psychology*, 22, 332–351.
- Lenfant, F., Loret, C., Pineau, N., Hartmann, C., & Martin, N. (2009). Perception of oral food breakdown. The concept of sensory trajectory. *Appetite*, 52, 659–667.
- Lindstrom, M. (2005). Broad sensory branding. *Journal of Product & Brand Management*, 14, 84–87.
- Mitchell, C. J., De Houwer, J., & Lovibond, P. F. (2009). The propositional nature of human associative learning. *Behavioral and Brain Sciences*, 32, 183–198.
- Neter, J., Kutner, M., Wassermann, W., & Nachtsheim, C. (1996). *Applied linear statistical models* (4th ed.). McGraw-Hill, Boston ed..
- O'Brien, H. L. (2010). The influence of hedonic and utilitarian motivations on user engagement: The case of online shopping experiences. *Interacting with Computers: Special Issue on User Experience*, 22, 344–352.
- Sarkar, A. (2011). Impact of utilitarian and hedonic shopping values on individual's perceived benefits and risks in online shopping. *International Management Review*, 7, 58–65.
- Schifferstein, H. N. J. (2006). The perceived importance of sensory modalities in product usage: A study of self-reports. *Acta Psychologica*, 121, 41–64.
- Schifferstein, H. N. J., Fenko, A., Desmet, P. M. A., Labbe, D., & Martin, N. (2013). Influence of package design on the dynamics of multisensory and emotional food experience. *Food Quality and Preference*, 27, 18–25.
- Steptoe, A., Pollard, T. M., & Wardle, J. (1995). Development of a measure of the motives underlying the selection of food: The food choice questionnaire. *Appetite*, 25, 267–284.
- Wansink, B., & Westgren, R. (2003). Profiling taste-motivated segments. *Appetite*, 41, 323–327.