Effects of background sound on consumers’ sensory discriminatory ability among foods

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Introduction

- Food perception can be influenced by one or a combination of five senses.
- Sounds elicited by mastication and swallowing process can influence food perception such as crispiness and carbonation (Saysener & Iwenne, 2000).
- Similarly, background noises, sounds that have less particular connection to the food consumed, also modulate food perception.
- Previous studies have demonstrated that background noise unrelated to the food being consumed can modify taste perception (Wood et al. 2011; Stafford et al. 2012).
- Influences of auditory cues should be dependent on not only individual sensory attributes, but also the integration of multiple attributes.
- It is also important to understand the ambient sound conditions that are present during mealtime in daily life.

Objectives

- Examine accustomed and preferential levels of background sound in eating atmospheres across different demographics.
- Determine the effect of common background sounds on consumers’ overall discriminatory ability during the drinking and mastication process.

Materials and Methods

Experiment 1

- A total of 244 (108 men and 138 woman) with mean age of 40 years (standard deviation ± 13 years) filled out a questionnaire composed of four main questions regarding background sound conditions related to eating.

- Question 1: Estimate the average background sound level when they consumed four types of meal (i.e., breakfast, lunch, dinner, and snack) during the past week (9-point Likert scale).

- Question 2: Estimate the frequency of seven eating atmospheres in the past week for the previously asked meal types.

- Question 3: Select most preferred eating atmosphere among the seven examples.

- Question 4: Preferred level of background sound while eating (9-point Likert scale).

Experiment 2

- Fifty-eight volunteers (22 men and 36 women) with an age range from 20 and 69 years [mean age ± standard deviation (SD)] = 39 ± 16 years] participated.

- Two types of food, potato chips and carbonated soda, were used:
  - Original Lay and a reduced sodium alternative (Frito-Lay, Plano, TX, USA)
  - Sprite and Sprite Zero (The Coca-Cola Company, Atlanta, GA, USA)

- Five background sound conditions were used:
  - Carbonation sound (popping effervescence from a soda being poured)
  - Crisp chewing sound (initial stages of mastication of a crisp food)
  - Classical music (Mozart’s Piano Sonata No. 12 in F Major)
  - Shadowing task (BBC news recording)
  - White noise (fixed width frequency at 1000 Hz)

To examine participants’ discrimination ability, a set of triangle tests were used.
- Each food set was tested against each sound condition for each participant.

Results and Discussion

- The frequency, shown in Table 1, of an eating scenario depends on the type of meal
  - The frequency at which people may eat in different scenarios, their associated sound conditions, and the preferred eating scenario should also be taken into consideration.
  - This information may be important to marketers that may want to choose advertisement targets and times for products around certain mealtime. Furthermore, estimating the volume of background sounds (e.g. background music) may change with age where certain meals may be enjoyed more at lower or higher volume levels.

- Participants were able to discriminate sensory differences which were present between the two types of potato chips in all five sound conditions: crisp chewing sound (p < 0.01), carbonation sound (p < 0.001), classical music (p = 0.02), shadowing task (p < 0.01), and white noise (p < 0.01).

- Participants were able to discriminate sensory differences exhibited between the two types of carbonated sodas in the presence of all sound conditions (p < 0.001) except the shadow task (p = 0.19).

- As shown in Figure 2(b), participants showed significantly better performance in discriminating carbonated sodas while they were listening to carbonation sound (p = 0.001) or classical music (p = 0.04) compared to while conducting the shadowing task.

Conclusions

- In our study, we have shown that not only do individuals prefer eating while having a conversation, but that this form of communication increases with certain mealtimes (e.g., lunch and dinner).
- Individuals were unable to distinguish foods that elicited less noise while engaging in a scenario involving people.

References