Effects of Smell on Taste Perception

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The way taste and smell interact with one another can affect the way one perceives what they are eating.

- Stevenson, Prescott, & Boakes (1999)
  - This study used 5 different odors and 2 tasting samples to test the interaction between taste and smell.

- Frank and Byram (1988)
  - This study examined the effect of different smells on taste perception by pairing a strawberry scent or peanut butter scent with a stimuli
The Basics

- Design: One Factor Multiple Level, Between-Groups Design
- Hypothesis: The essential oils (peppermint and lemon) will make it less likely for participants to guess that they had eaten a pretzel.
- Independent Variable: Smell
  - Three Levels:
    1. Control (No Smell)
    2. Peppermint Oil
    3. Lemon Oil
- Dependent Variable: Taste Perception
Materials

- Blind Folds
- Paper slips assigned with a condition
- A bowl/hat
- Cotton Balls
- Peppermint Essential Oil
- Lemon Essential Oil
- Pretzel Sticks
- Writing Utensils
- Questionnaire
Participants

- Total Participants = 56
- Women = 35
- Men = 21
- $M = 31.43$
- $SD = 15.3$
- Mode = 20
- $Md = 24$
- Range = 18-72
Participants

- All participants were recruited on a volunteer basis
- All participants gave informed consent
- All participants were asked if they were allergic to certain foods
- All participants were debriefed
Procedure

- Participants were asked if they would participate in a short experiment. If they gave consent, they were then asked if they had any food allergies.
- The participant was asked to sit in a chair, and the experimenter blindfolded them.
- A random number was chosen to determine what group they would be in for smell.
- If they were not chosen for control group, the experimenter placed either lemon or peppermint extract onto a cotton ball, and told the participant they were going to be eating something and to please open their mouth. The experimenter then placed the pretzel stick in their mouth and told them they could chew, at the same time, the experimenter placed the cotton ball under their nose as they ate.
- Once the participant had finished their pretzel, the evidence of extract was removed, then the blindfold was removed.
- The participant then answered Likert-type survey questions, they were debriefed, and thanked for their time.
Questions

1. How likely is it that you tasted a lemon cookie?
2. How likely is it that you tasted a pretzel?
3. How likely is it that you tasted peppermint bark?
4. How likely is it that you tasted a chip?

- The questions were answered using an interval, likert-type scale from 0 (Not at All) to 3 (Greatly).
Results: Question 1

- $F(2, 53) = 13.19, \ p < .001$
  - Participants in the lemon condition differed significantly from those in the control condition ($M = .64, \ SD = .14$) and peppermint condition ($M = .63, \ SD = .14$).
Results: Question 3

- $F(2, 53) = 26.70, p < .001$
- Participants in the peppermint condition differed significantly from those in the control condition ($M = 1.17, SD = .17$) and lemon condition ($M = 1.17, SD = .19$).
Results Continued

No Main Effect:

- Question 2: $F(2, 53) = 1.88, p = .16$
  - Regardless of condition, a majority of participants were able to discern that they had tasted a pretzel.
- Question 4: $F(2, 53) = 2.54, p > .05$
  - Regardless of condition, participants were not likely to guess that they had tasted a chip.
Limitations

- Lack of standardization
  - Different amounts of oil was used by each experimenter
  - Different brands of essential oils were used by each experimenter
- Different Environments
  - Not all participants were exposed to the oil in the same environment, so other smells could have interfered.
- Not a large enough sample size
Limitations

- Lack of Neutral Gender
  - The study consisted of more females than males
- Participants
  - Students involved in the study may have been psychology majors
- Allergy
  - Due to the experiment being food related, allergies could cause limitations on which foods could be used in the experiment.
Future Research

- Conduct the experiment in a laboratory setting for better control
- Break the independent variable down even further with a blocked smell condition
- Examine possible cultural differences in smell and taste perception
Future Research

- Cap the gender amount of male and females at a reasonable number.

- Seek out possible participants outside of UNCW or outside the psychology major.

- Seek out a different food type without common allergic reactions.
Questions or Comments?