

Reagan Plymale and Anne Baldwin

Faculty Mentors: Drs. Ruth Hannibal and Crystal Randolph

Department: Communication Sciences and Disorders

Introduction

Tepper, Banni, Melis, Crnjar, and Barnarossa (2014) describe taste as “the sensory modality that enables organisms to distinguish nutrient-rich food from noxious substances, and acts as a final checkpoint for food acceptance or rejection behavior” (p. 3364). The compound 6-n-propylthiouracil (PROP) is a marker of genetic variation in taste (Duffy & Bartoshuk, 2000). According to Tepper (1998), PROP is a member of a class of compounds that carries a chemical group, responsible for the characteristic of bitter taste. Taste sensitivity varies in individuals and has been shown to have an influence on food preference as well as health (Tepper, et al., 2014)

Tepper et al. (2014) describes individuals as being either super-tasters, tasters, or non-tasters to the bitter taste of PROP. Drewnoski, Henderson, Hann, Berg, and Ruffin (2000) used similar identifiers in their research, using the terms medium tasters, supertasters, and nontasters. They researched the responsiveness to PROP and compared it to the acceptance of cruciferous, green, and raw vegetables. In their research, they found women who stated they did not like cruciferous vegetables to be either medium or supertasters. They concluded that a greater responsiveness to PROP was associated with a lower acceptance of cruciferous vegetables (Drewnowski et al., 2000).

Tsuji, et al. (2012) did a study to examine the intake of plant-based foods in relation to the responsiveness to PROP. They identified subjects as either tasters or nontasters based on their ability to taste PROP. They then compared those results to the dietary records of Japanese children, ages 4-6. They found that a high intake of plant-based foods was associated with a low sensitivity to PROP. This indicated that there is a link between genetics and eating habits (Tsuji, et al., 2012).

Method

Fifty-four students, who are enrolled in the Introduction to Neurology in Communication Disorders course participated in this study. These fifty-four students were divided into section A, containing thirty-four students, and section B, containing 20 students. Altogether, the participants consisted of 49 females and 5 males, with a mean age of 22. The instructions were provided orally by the professor. Students were given a square piece of paper towel, a 6-n-propylthiouracil (PROP) tasting strip, and a data sheet. Students were required to fill out the top portion of the data sheet before the experiment began. After completing the data form, the students were required to place the tasting strip in their mouth and wait for a taste. After tasting the strip, students were required to record whether the strips were ‘strongly bitter’, ‘bitter’, or that there was ‘no taste’. After all responses were recorded, the data sheets were collected by the professor.

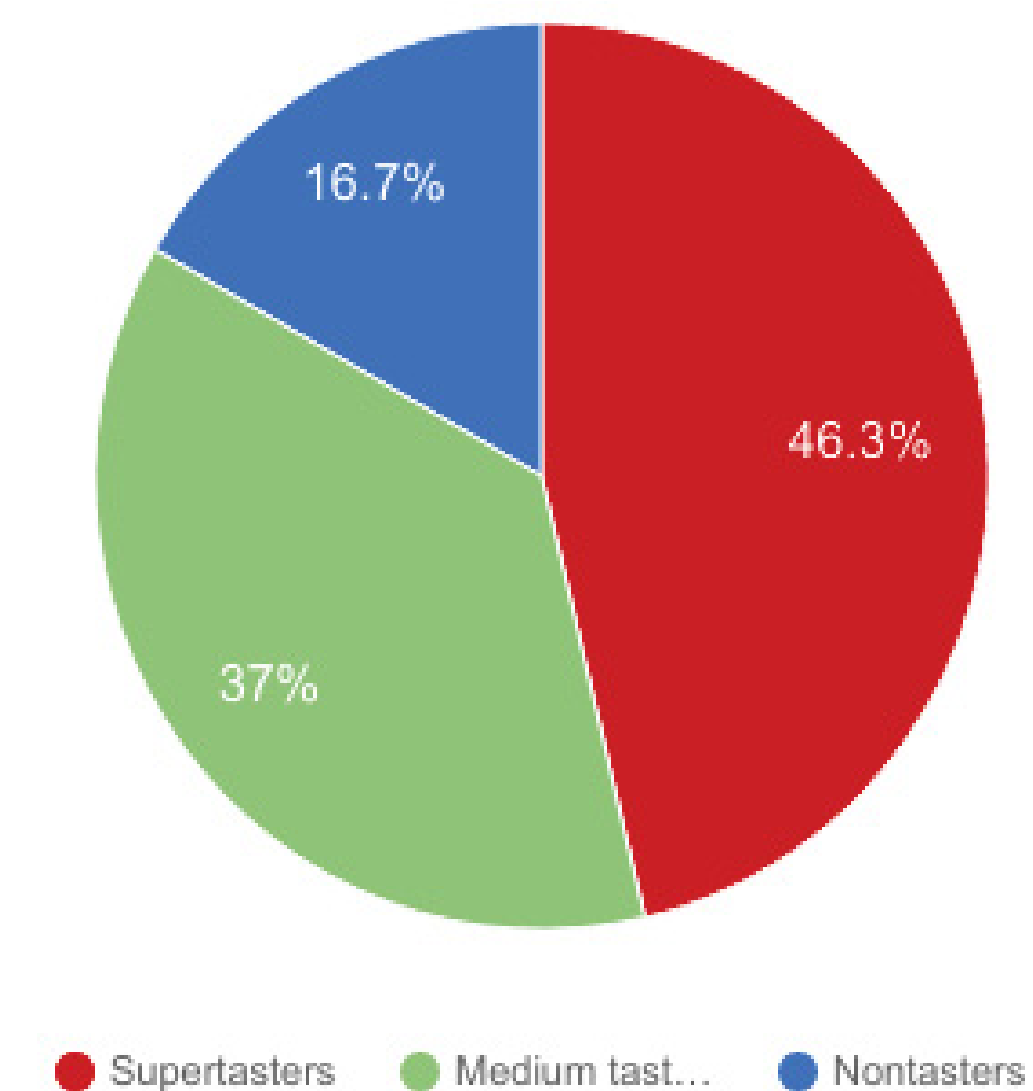


6-n-propylthiouracil (PROP) tasting strip

Results

Out of the fifty-four students that participated, 25 students declared the taste strips to be strongly bitter, 20 students said that the taste strips had a medium bitterness, and 9 students claimed that they did not taste anything. According to these results and the literature, the first 25 students mentioned would be classified as supertasters, the 20 students would be classified as medium tasters, and the last 9 students mentioned would be classified as nontasters.

Taster Classification



Conclusion

When comparing results, we found that section A results correlated with section B results pertaining to all 3 classifications. ‘Bitter’ was the most prevalent classification in both classes, while ‘no taste’ was the least prevalent in both classes. Our results correlate to literature as we found 3 levels of tasters, which correlate to the classifications of ‘supertasters’, ‘medium tasters’, and ‘nontasters’ which have been used in literature.

References

- Duffy, V. B., & Bartoshuk, L. M. (2000). Food acceptance and genetic variation in taste. *Journal of the American Dietetic Association*, 100, 647-655. doi:10.1016/S0002-8223(00)00191-7
- Tepper, B. J. (1998). Genetics of perception '98: 6-n-Propylthiouracil: A genetic marker for taste, with implications for food preference and dietary habits. *The American Journal of Human Genetics*, 63, 1271-1276. doi:10.1086/302124
- Tepper, J. B., Banni, S., Melis, M., Crnjar, R., Barnarossa, I. T. (2014). Genetic sensitivity to the bitter taste of 6-n-Propylthiouracil (PROP) and its association with physiological mechanisms controlling body mass index (BMI). *Multidisciplinary Digital Publishing Institute*, 9, 3363-3381. doi:10.3390/nu6093363
- Tsuji, M., Nakamura, K., Tamai, Y., Wada, K., Sahashi, Y., Watanabe, K., & . . . Nagata, C. (2012). Relationship of intake of plant-based foods with 6-n-propylthiouracil sensitivity and food neophobia in Japanese preschool children. *European Journal Of Clinical Nutrition*, 66, 47-52. doi:10.1038/ejcn.2011.127