

Research Finds Biological Basis for Children's Taste Preferences

It is common knowledge that children have a fondness for foods and liquids that taste sweet and salty, but the reason why has not been fully understood by researchers. Thanks to a recent study by researchers at the Monell Chemical Senses Center in Philadelphia, funded in part by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), there is now evidence that sweet and salty taste preferences are related to children's biology.

This study stems from the efforts of the NICHD's Taste and Flavor Research Working Group, which is tasked with summarizing current knowledge of drug palatability, taste masking, and bitterness reduction; summarizing the appropriateness of current pediatric taste test studies; and identifying gaps in knowledge. This Working Group is one of four that were created in 2005 as part of the U.S. Pediatric Formulations Initiative (PFI). The PFI is a project of the NICHD, National Institutes of Health (NIH), and was established to address the issue of the lack of appropriate formulations in children and to use this activity as a means to improve pediatric formulations as mandated by the Best Pharmaceuticals for Children Act (BPCA).

The Monell research comprised a 2-day single-blind study of 108 children between ages 5 and 10, and their mothers. The results demonstrated that preferences for salty and sweet tastes reflect measures of growth in children and that children prefer sweeter and saltier tastes than do adults. These findings have important relevance to global efforts to change and improve children's diets. As noted by the study authors, "Many illnesses of modern society are, in part, the consequence of poor food choices." Because the average American child consumes sugar and salt in excess of what is recommended for a healthy diet, understanding taste preferences can help researchers discover better, more effective ways to reduce children's intake of unhealthy foods.

The study's lead author, Julie Mennella, Ph.D., a biopsychologist at Monell and Chair of the NICHD Taste and Flavor Research Working Group, explains the importance of the information, noting that "the present findings reveal that the struggle parents have in modifying their children's diets to comply with recommendations appears to have a biological basis . . . it also paves the way toward developing more insightful and informed strategies for promoting healthy eating that meet the particular needs of growing children."

Specifically, study results showed children who most prefer high levels of sweet tastes also most prefer high levels of salty taste. In addition, for children, a preference for sweeter tastes correlated with taller than average height, but not with body weight or percent body fat. In contrast, a preference for saltier tastes was linked to children's percent body fat, but not to their height. It was also discovered that higher preferences for sweet tastes related to spurts in bone growth.

Taste preferences have a direct impact on the health of children because, as Mennella explains, “Growing children’s heightened preferences for sweet and salty tastes make them more vulnerable to the modern diet, which differs from the diet of our past, when salt and sugars were once rare and expensive commodities.”

Sweet and salty taste preferences were also correlated in adult study participants. However, adults differed from children in one important area. For adults, their sweet receptor genotype (*TAS1R3*) was related to the most preferred level of sweetness, but for children it was not. Study co-author Danielle Reed, Ph.D., notes that “There are inborn genetic differences that affect the liking for sweet by adults, but for children, other factors—perhaps the current state of growth—are stronger influences than genetics.”

Although additional studies with larger sample sizes will be useful in confirming these findings, this study paves the way for developing more informed strategies for improving the dietary habits among growing children. Study results were published online at [PLOS ONE](#).

Because ‘taste’ is the primary reason for rejection of liquid formulations by children, so flavor and palatability are important issues. Further research into taste preferences are also directly linked to development and enhancement of pediatric formulations. Future studies could include research into the efficacy of taste blockers (such as salts and sugars) on bitter taste in children and the development and validation of methods for taste testing in children of varying ages..

The Taste and Flavor Working Group has already summarized the current knowledge of drug palatability and methods used to promote the development and/or harmonization of age-appropriate, standardized, psychophysical methods for testing drug formulations in child- and adult-testing panels; proposed the development of *in vitro* and animal models to predict the degree of bitterness likely to be sensed by children; and suggested research designed to increase understanding of the intracellular mechanisms of bitter taste signaling.

The Monell study was part of the NIH project initiative titled Model for Sensitive Periods in Early Flavor Learning, supported by grants from the NICHD (R01HD37119), the National Institute on Deafness and Other Communication Disorders (R01DC011278, P30DC011735, T32DC000014), and the National Center for Research Resources (UL1RR024134)—all part of the NIH. Additional support came from the Pennsylvania Tobacco Research Settlement Fund, the Pennsylvania Department of Health. The Monell Chemical Senses Center is an independent nonprofit basic research institute based in Philadelphia, Pennsylvania. For more information about Monell, visit www.monell.org.

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