





What are Supertasters?



- Supertasters are people with a superior sense of taste.
- Supertasters display increased sensitivity for the following tastes: bitter, sour, sweet, salty, umami (savoury – indicates the presence of protein).
- Recent evidence suggests that supertasters may also display increased sensitivity for the taste of fat.
- Their anterior tongues have a high density of fungiform papillae: structures that house taste buds.

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Taste in the general population



- It is estimated that approximately 25% of the population are supertasters.
- Approximately 35% of women are supertasters, compared with just 15% of men.
- Roughly 50% of the population are average in their sense of taste.
- Approximately 25% of the population are "non-tasters": people with a comparatively poor sense of taste.
- Supertasters' tongues have up to 1000 taste buds per square centimetre; non-tasters have as few as 50 taste buds per square centimetre.

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Taste in the general population



- Taste buds appear when a foetus is about seven weeks old and are functioning by the third trimester of pregnancy.
- Sensitivity to taste fades with age. At about age 60, even healthy people begin to experience a modest decline in taste and more dramatic declines in smell.
- Changes can also result from medications, illnesses such as Alzheimer's disease, hormones and environmental factors (e.g. pollution).

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WHAT IMPACT DOES HAVING MORE TASTE RECEPTORS HAVE ON BEHAVIOUR?



- Supertasters may be more likely to become professional wine tasters.
- In comparison, non-tasters may not be able to tell the difference between cheap plonk and fine wines.
- Recent evidence suggests that, when compared with normal and non-tasters, supertasters consume less alcohol, eat less fatty and sugary foods, and have a lower BMI.

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Consider these important questions...



- Does having more taste buds mean you are better at detecting small concentrations of flavour (better detectability)?
- Does having more taste buds mean someone is better able to distinguish between flavours (better discriminability)?
- Are taste buds the only receptors involved in the perception of flavour? (what about our sense of smell – airborne molecules released from food stimulating olfactory receptors).
- What about neural processing beyond the taste buds?

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How would you measure whether someone was a supertaster?



- o Group discussion!
- o Think of three ways in which you would measure tasting ability in a "participant".
- o How feasible is each method (i.e. cost, duration, impact on participant)?
- o Which would be the ideal method (i.e. validity, reliability)?
- o Which one would be the easiest to implement in a large study (i.e. ~30 people to test in one sitting)

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HOW CAN WE MEASURE WHETHER YOU ARE A SUPER-TASTER?




- o We could place small amounts of a bitter chemical on your tongue and measure the amount of chemical required to detect it.
- o The less amount of chemical you need to detect the bitterness, the more sensitive you would be.
- o That is a sound approach but could take us some time to do.

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HOW CAN WE MEASURE WHETHER YOU ARE A SUPER-TASTER?

- o Another strategy would be to count the number of taste buds on your tongue and assume that number is a good measure of your sensitivity to chemicals. It is quicker but an indirect method of measuring whether you are a super-taster.



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HOW CAN WE MEASURE WHETHER YOU ARE A SUPER-TASTER?



- We are going to use some blue food colouring as a stain to count your papillae.
- Your tongue will take up the dye, but the papillae will stay pink.
- We will do this in pairs and measure each others' papillae. Don't put blue colouring on your tongue if think you might have an allergy to it!

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TIME TO COUNT YOUR PAPILLAE...



- Place a paper reinforcement ring (about 7mm in diameter) onto the tip of your partner's tongue.
- Using a cotton bud, swab some of the food colouring inside the ring. BE CAREFUL NOT TO SPILL THE DYE ON YOUR CLOTHES OR SKIN!
- Using your Phone (or you can move yourself closer to the window for better light), count how many pink dots are inside the hole.
- Fewer than 15 papillae mean your partner is an insensitive "non-taster", between 15 and 35 indicates an average "taster" and over 35 papillae then your partner is a "super-taster".
- Record your data on the computer

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EXAMINING THE DATA...



- Who was a super taster according to our cutoff?
- Who was a mere mortal?

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Group discussion

- How accurate do you think our method of counting is?
- What would happen if we counted the taste buds again?
 - i.e. Do you think these findings are reproducible (think about the validity and reliability of our methodology)?
- What would happen if we measured on a different part of the tongue?

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Taste test!

- Two supertasters and two “non-tasters” come to the front and test out your skills!



Specific food sensitivities

- Certain alcoholic beverages
- Brussels sprouts
- Cabbage
- Coriander
- Coffee
- Grapefruit juice
- Green tea
- Soy products
- Carbonation in drinks (i.e. soda, beer, etc)
- Supertasters - do you have any other foods you avoid?

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MOVIE BREAK!

o http://www.youtube.com/watch?v=Hd_mxyMAJJY

o 6 mins - 9.11

Is your perception of flavour affected by your sense of smell?



- o Come on back, supertasters and non-tasters!
- o Let's investigate further...



Is your perception of flavour affected by your sense of smell?



- o How does your sense of flavour change when you have a cold?
- o Why might the brain combine sensations about smell and taste?

Interesting facts



- o Poisonous plants or berries tend to taste bitter, so super-tasters may be less likely to consume poisonous or contaminated food.
- o However, super-tasters avoid the bitter flavonoids that are found in broccoli, grapefruit, and other foods that reduce our risk of cancer.
- o On the other hand, super-tasters also avoid very salty, fatty, and sugary foods so they tend to be thinner, lowering their risk of heart disease.

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GENDER DIFFERENCES?



Group discussion:

- o About two-thirds of super-tasters are female. One theory suggests that super tasting served as a survival mechanism. Why do you think this would be important?
- o But most women are NOT super-tasters. Does this refute your argument? If you argue that super-tasting is essential, why aren't all women super-tasters?
- o Approximately 1/3 supertasters are male - why do you think this might be important?

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Other super skills!



- o Super recognisers:
 - Neural networks we use to process faces (i.e. primarily the fusiform gyrus) are separate from those we use for recognising other objects i.e. cars, animals, etc.
- o Tentative estimate (New Scientist): 1 in 50 people
- o <https://www.youtube.com/watch?v=PuPfQ8UZTGQ> (stop at 4:45)

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There's a spectrum...



- Prosopagnosia (Greek: “prosopon” = face, “agnosia” = not knowing)
 - Disorder of face perception where recognition of faces is impaired but you can still recognise other objects
- The fusiform gyrus is implicated in Prosopagnosia can be acquired or congenital

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Qualitative account of prosopagno:



- “I can see faces clearly, but as soon as the person is out of sight they are, for me, literally out of mind. I can recall a hair style, eye color...but the facial features as an organized whole become lost on me...For example, if we met at a crowded party and you said your name was Dave, and if we bumped into each other again...there's a fair chance I might tell you all about the Dave I had just met earlier.”
Taken from Oliver Sacks, “The man who mistook their wife for a hat.”

- <http://www.youtube.com/watch?v=k5bvnXYIQ8>

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Group discussion



- Are there any prosopagnosics or super recognisers in the class? Can you describe your experiences?
- What do you think are the evolutionary benefits to being a super recogniser?

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NEXT WEEK...



- Quantitative Methods
- Before next week, ponder this: If you were conducting psychological research, how would you measure happiness?

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