

Both genetics and environment may influence children's food preferences

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Researchers from [University College London](#), UK, performed a large-scale twin study to investigate the relative contribution of genetic and shared environment factors to children's preferences for certain food groups. The study revealed a substantial genetic influence on preferences for fruits, vegetables and proteins. Further analyses showed that a shared environment has more impact on preferences for dairy, starch and snacks. Based on these findings, the researchers concluded that both genetics and environment may influence children's food preferences.

The importance of providing children with a healthy diet is beyond any doubt, but, according to the researchers, there are different views between parents and health professionals on what influences children's food preferences. On the one hand, health professionals claim that dietary habits are mainly derived from the 'home food environment' and are learned (nurture). Being offered more nutritious and less energy-dense foods would, therefore, guide children's dietary choices. But parents believe that despite their efforts to provide a healthy diet, some children simply dislike certain sorts of foods, indicating genetic influences on taste (nature).

In order to assess the impact of genetics, twin studies are usually performed. They are a good model to distinguish the contribution of genetic and environment factors. Twins can be monozygotic or dizygotic. Monozygotic or 'identical' twins developed from one fertilised egg cell (zygote) that splits and forms two embryos. They share 100% of their genes. Dizygotic or 'fraternal' twins develop from two eggs, each fertilised by a separate sperm cell, and share 50% of their genes. In order to achieve the best results on the effect of genetic and environmental factors on - in this case - food preferences, twin studies should have large sample sizes and test a wide variety of foods.

The participants in this study came from families that took part in a population-based observational study (cohort) of twins born in the United Kingdom in 2007. For a total of 2,686 twins, both identical and fraternal (34% and 65% respectively, with about 1% of which this was unknown), with an average age of 3.5 years, food preferences of the children were recorded by their parents. Given the age of the children and the sample size of the study, neither self-reporting by the children nor observation by a professional were possible, the researchers relied on the parents for the data collection. The preferences were analysed for 84 foods, divided-up by the researchers into six categories: vegetables, fruits, proteins, dairy, starches, and snacks.

Firstly, children's 'liking' towards the foods was assessed. The results showed that the least liked group was vegetables, where only four (sweetcorn, peas, tinned tomatoes and cooked carrots) out of 19 types were liked by children. The most liked group was the one defined as snacks and all foods in this group (including sweets, chips, cakes and ice cream) were liked. Correlations between preferences for the food groups were then calculated. The strongest correlation (or relation) was seen between fruits and vegetables, meaning

that children who liked fruits also liked vegetables. The weakest correlation was observed between vegetables and snacks. The researchers also measured whether there was an effect if the child was either an identical or fraternal twin, but they did not find any effect on the above mentioned correlations.

The researchers finally assessed the extent to which genetics and the environment play a role in the preference for certain food groups. This calculation is based on a comparison of correlations between monozygotic and dizygotic groups. It was shown that genetics have a stronger influence on preference for fruits, vegetables and proteins, and a lower influence on preference for snacks, starches and dairy. The shared environment, when children live with their parents in a family, had a strong effect on the preferences for snacks, starches and dairy, and was moderate for fruit, vegetables and proteins. The effect of the non-shared environment, experienced outside of the family, was small for all food groups. This can be explained by the fact that the children were still young, brought up in the same home, and not exposed much to different environments (schools, playgrounds, etc).

This large-scale study demonstrates that both genes and the environment are important determinants of food preferences in children, and that their relative importance depends on the type of food. The fact that liking of fruits, vegetables and proteins is more strongly determined by genetics does not mean that our genes are the sole influencer, and that the innate preference cannot be changed. The family environment also has a strong role to play. Therefore, parents and care-givers should keep encouraging children to taste new foods, and persistently offer a variety of flavours and textures – also those that are initially disliked. This could prevent a too restricted food choice later in life.

For further information please see:

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