I.F. Briefing 9

How Family Relations Influence Children's Health

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The notion that 'obesity runs in families' has been supported by many previous twin and family studies. Comparatively little is known as to how similar family members are in dietary intake, and whether this resemblance differs for different types of foods or depends on the children's age.

Family resemblance can arise from shared genes and shared environments. Parents and their children have a similar genetic make-up – they share 50% of their segregating genes. They also share the same home environment. Spouses can also be similar because of assortative mating (partners choose each other on the basis of shared characteristics) or social interaction. Nonetheless, each individual in a family has unique experiences. Environmental influences that encourage differences among children from the same family could include accidents, illnesses, trauma, friendships, experiences of school, etc.

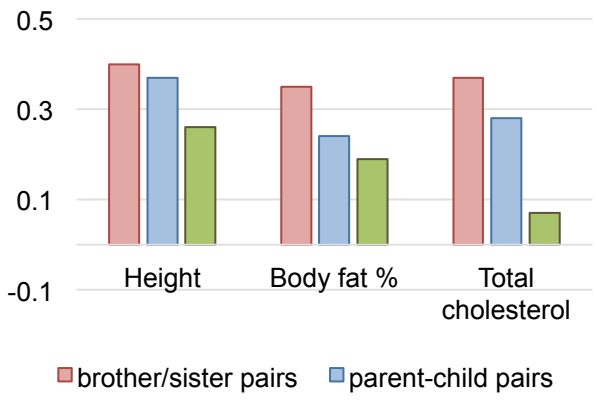
How can we tease apart familial and non-familial influences? The only way to learn about these differences is to conduct family studies. I.Family provides us with the unique opportunity to find out how much of the variation in a trait is determined by the family and how much is explained by factors outside the family.

What we did in I.Family

In order to examine the effects of family influence versus external influences on obesity-related traits and behaviours, we studied parent-child pairs, brother/sister (sibling) pairs and parental pairs and examined their resemblance. Altogether, we looked at about 4,800 families. One of the factors we examined was diet. We used a 'food frequency questionnaire' and an online tool called SACANA (24-hour diet recall) developed especially for the study. We calculated nutrient intakes and characterized foods as healthy and unhealthy based on their sugar, fat and fibre content.

Key finding 1*

Family members resemble one another in terms of height, body fat measures and cardiovascular disease risk (e.g. total cholesterol). This is shown in **the chart on the right, which gives correlations for height, body fat percentage and total cholesterol**. The resemblance is stronger for biological relatives (sibling pairs, parent-child pairs) than non-biological relatives (parental pairs). This indicates that these traits are likely under strong genetic influence; however other factors such as assortative mating for height and body fatness (for parents) could also play a



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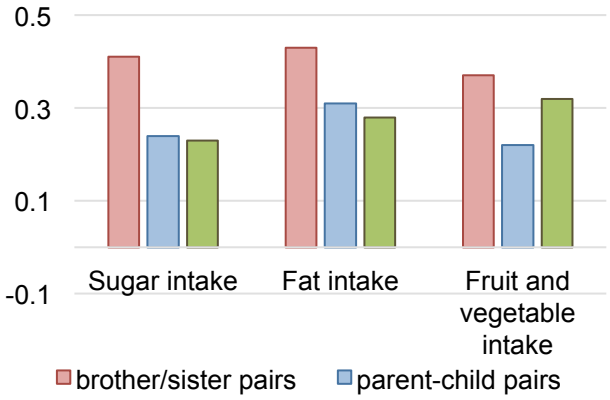
role. Sibling correlations for body fatness and total cholesterol are stronger than parent-child correlations. This indicates that the environment shared by siblings is important for these traits too.

Family members also have similar diets. **The chart on the right shows correlations for sugar, fat, and fruit & vegetable intake.** Interestingly, the resemblance is strongest for sibling pairs and a bit less for parent-child and parental pairs. Since the correlation is similar in genetically related and non-genetically related family members, we can infer that the shared household is an important factor in dietary intake. The dietary intake of brothers and sisters is more similar – they are likely to share more environmental influences on their food intake, such as friends or schooling.



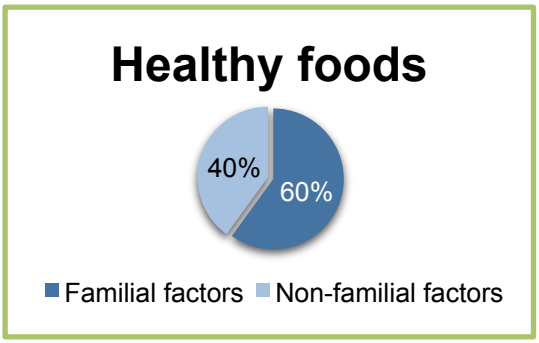
Key finding 2

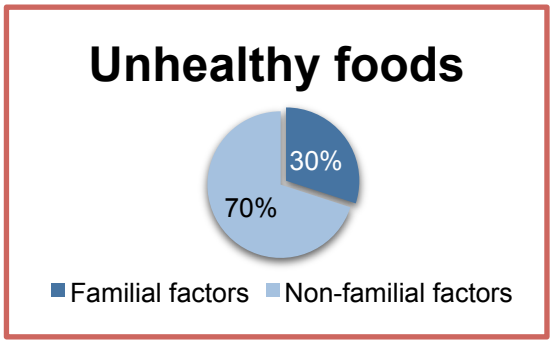
Parents and their children have similar food intakes. This is especially true for the intake of healthy foods, but less so for the intake of unhealthy foods**.** One possible explanation goes as follows: In the developed European societies in which the I.Family study was conducted, there are many external influences promoting unhealthy foods to children (e.g. supermarkets, advertising, pester power, etc.). However, there are few external influences for healthy foods.

As younger children consume most of their main meals at home, the home environment is likely to be the main factor explaining intake of healthy foods, including fruit and vegetables. If such foods are not made available to children at home, children are unlikely to consume them outside the home. In addition, children have a higher natural preference for sweet tastes than adults. So it is not surprising that we see more variation between children and parents when it comes to eating unhealthy foods.

Parent-child correlations for healthy and unhealthy food intake

Familial factors explain 60% of the variability in the intake of healthy foods but only half as much (30%) in the intake of unhealthy foods.

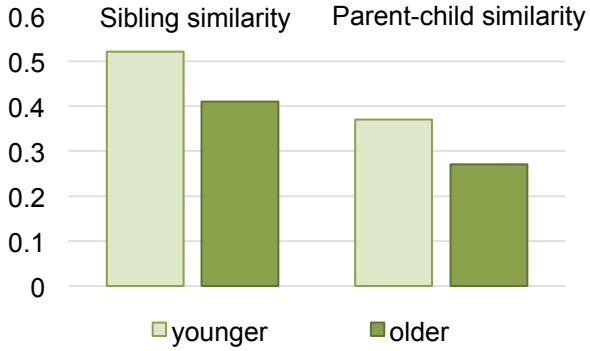




Key finding 3

In terms of the intake of healthy foods, there is a greater resemblance between younger sibling pairs (< age 11 years) than older sibling pairs (≥11 years), and parents and their younger children (< age 11 years) than parents and their older children (≥11 years). It is likely that family meals decline and the influence of friends becomes more important as children become older and more independent.

Sibling and parent-child correlations for healthy food groups, comparing younger and older children



Future research

In the future, we aim to study whether special factors are at work in families where one child is overweight and another child is not. Using our study data, we should be able to work out which factors are most important and, therefore, what the focus should be for interventions in such cases.

Key messages

- Our results show that family members resemble one another in terms of diet and obesity-related traits – there are many different reasons for this.
- Because the family environment is so important, interventions aimed at reducing obesity and improving diet quality may be more effective when targeting the entire family rather than individuals.
- We would also expect family-based interventions to be most successful when promoting healthier diets (rather than discouraging less healthy diets) and when they target families with younger children.
- Familial factors play a larger role in explaining healthy food intake and a smaller role in explaining unhealthy food intake. This underscores the importance of parents' role modelling in making healthy food choices available at home, which remains important when children enter their teens. It also highlights the major role of contemporary food environments in promoting unhealthy foods to children and their effects on children's dietary intake already at early ages.

* The findings presented in this briefing are based on current analyses of I.Family data.