



Happiness Is a (Small) Piece of Cake



By Pierre Chandon , INSEAD Professor of Marketing

Children inaccurately expect larger portions of a snack to be more enjoyable. A sensory imagery intervention can help them select healthier portion sizes.

If you were a hungry 10-year-old around 4 pm, would you choose a small, medium or large portion of applesauce as a snack? What if it was a brownie? Do you think it's always true that eating enjoyment increases with quantity?

My past research on food choices has uncovered how, as parents and eaters, we tend to focus on what we eat, not **how much**, yet **they both matter**. In the case of children, who may be picky eaters or grazers, we would like to help them choose a reasonable portion of good food. First, it's necessary to learn what kids think about food sizes, enjoyment and healthiness.

In the past, I've worked with [Yann Cornil](#), an INSEAD PhD and now a marketing professor at the University of British Columbia's Sauder School of Business, to examine how pleasure can be a path to moderate eating. We wanted to explore this question with children because the choices they make will spill over into [adulthood](#). Studying children's diet also allows us to understand the psychology of portion size choices before decision making becomes contaminated by consideration of value for money or by fad diets.

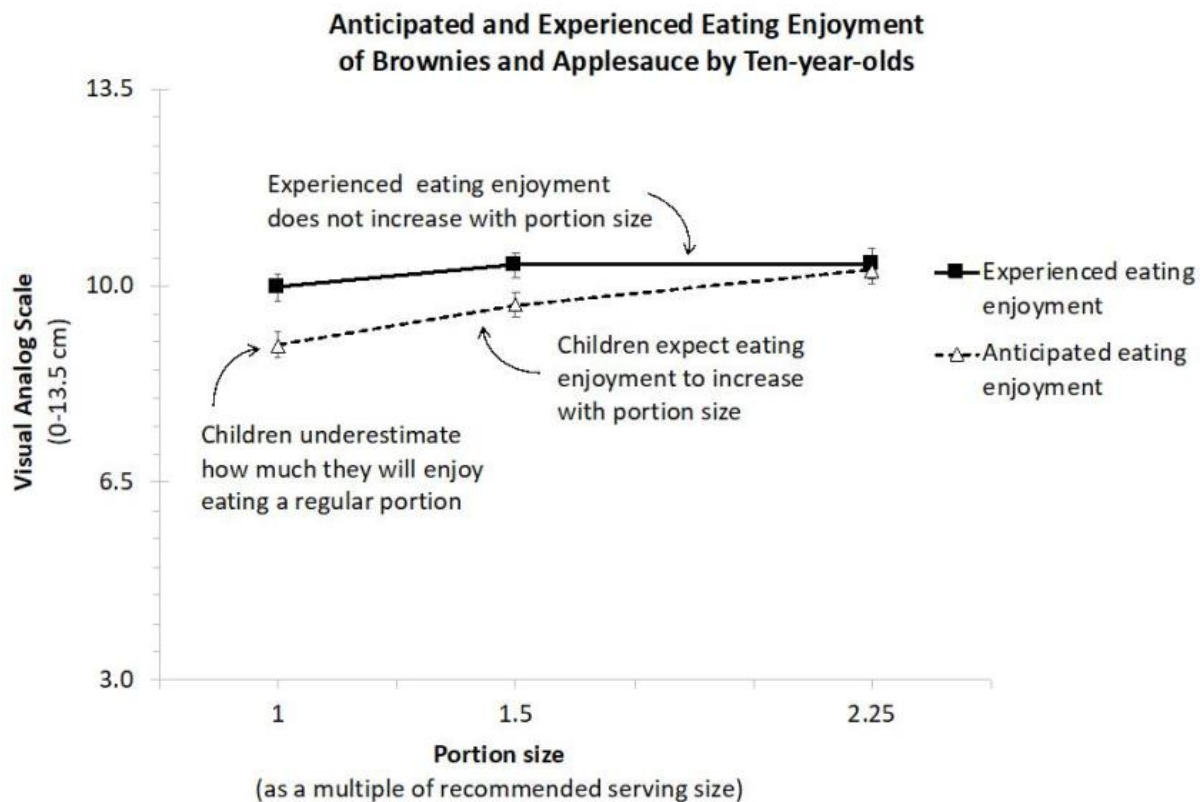
For this project, Cornil and I teamed up with [Camille Schwartz](#), [Christine Lange](#), [Célia Hachefa](#) and [Sophie Nicklaus](#), a group of professors and researchers at the French Centre des Sciences du Goût et de l'Alimentation in Dijon. We obtained funding from the French National Research Agency and collaborated with three local primary schools to study children's snack food choices during their after-school programme.

Can children accurately anticipate the effects of a snack's portion size on their eating enjoyment, hunger and healthiness perceptions?

Some of my earlier studies found that adults lack the ability to predict how satisfying or enjoyable a small piece of cake is, but does the same apply to children?

Using a kid-friendly questionnaire, we asked 83 children aged 8 to 11 years to anticipate how much they would enjoy a brownie or applesauce as a snack, how hungry they would feel after eating it, and how healthy they thought different sizes of snacks might be. They were shown a recommended serving size, one 50 percent larger and another 125 percent larger. Over subsequent sessions, kids were asked to eat each of these portions and then rate how much they actually enjoyed it, how hungry they felt after eating it and how healthy their snacks were. The results were [published](#) in the *International Journal of Behavioral Nutrition and Physical Activity*.

The old adage that children's eyes are bigger than their stomach was disproven. The children in this study turned out to be extremely accurate at predicting how hungry or how full they would feel after eating each portion. One idea behind overeating is perhaps that people don't understand the optimal amount to eat and inadvertently choose too much because they believe they will be hungry. In contrast, the kids in Dijon knew how they would feel after eating a small, medium or large portion.



When it comes to enjoyment however, children’s predictions were not so accurate. As shown in the figure, they anticipated that eating enjoyment would increase with portion size. In reality, they enjoyed the large portion as much as the medium or smaller ones. The figure also shows that children underestimated how much they would enjoy the smaller portion, which is the recommended serving size.

The pattern was totally different for perceived healthiness, which was not influenced by portion sizes, both before and after eating the snacks. Children understood that applesauce was a healthier option (even if they enjoyed the brownie more), but they were unable to understand that eating a small brownie (32 g = 146 kcal) would be healthier than a bigger one (71 g = 328 kcal). Kids don’t really understand health value based on portion size.

Do children respond to sensory imagery to improve their portion size choices?

As children expect larger snacks to be more enjoyable and don’t understand that they are less healthy than regular portions, what solution is there to improve their portion size choices?

When we are choosing between small, medium and large portions, typically we think about how hungry we will be after eating, not about how much we will enjoy each bite. As the first study showed, and as I explained in a previous [INSEAD Knowledge article](#), enjoyment is relatively stable and actually decreases when the portions become even larger than the ones tested in the first study. Why? Because each additional bite adds a little less pleasure than the preceding one. Our last bite of chocolate cake, for example, is typically either pretty bland or just a bit too much.

What we don't realise is that the overall enjoyment from eating that cake or that brownie, for example, is not the sum of the enjoyment that you take from each bite, but the average. Sometimes, even just the last bite determines how much we enjoy something.

In another study with the same team and similar schoolchildren in Dijon, [published](#) in *Appetite*, we showed that sensory imagery is a useful intervention to nudge children towards healthier portion size choices because it reduces the selected portion size of a brownie without reducing the selected portion size of applesauce.

The children had to choose between small, medium and large portions of brownies and applesauce. The small one (100 g of applesauce and 32 g for the brownie) is the recommended size, but the children didn't know that. The medium size was 50 percent bigger and the large was 50 percent bigger still.

One group of children followed the sensory imagery instructions. These children saw three images of appetising desserts and were encouraged to use all their senses to imagine their taste, delicious smell and crunchy or smooth texture. The other group (or "control") was shown images of different vacation spots and asked to imagine how these places would smell, sound and feel.

On average, despite being hungry or very hungry, the food sensory imagery group chose smaller portions of brownies. The 22 fewer kilocalories (a 7 percent reduction) isn't a huge number on its own, but it's statistically significant and it was entirely the children's choice, not the result of scolding or any pressure from the adults. As for the applesauce, there was really no effect, which is good news because this intervention shouldn't reduce the amount of good, healthy food that the kids are eating.

From 'what' to 'how much'

When we think about food, we tend to focus on what to eat, not how much to eat. Yet, choosing between a small, medium or large beverage, or between sharing a delicious dessert or gobbling it up on our own matters.

When assessing the healthiness of a portion, children only considered the quality of the food and didn't look at the quantity at all. This is known as **dose insensitivity**. Similarly, people tend to think that a food is healthy or unhealthy in and of itself, regardless of portions. Like the idea that salt is bad for you, but in fact everyone needs a bit of salt to survive. But it's the dose that creates the poison – too much salt isn't healthy at all. Similarly, a small portion of brownie can be part of a healthy diet.

Some have argued that evolution explains why we focus so much on what to eat. For example, when it comes to distinguishing between how much fruit and vegetables will fill us up, our predictions are **fairly accurate**. Generally, if our ancestors ate it, we seem to know how much we need. But when it comes to foods that are high in fat and sugar, like brownies, we need to work on how we're going to respond from a sensory point of view. As a parent, reminding your child (and yourself) to take time to consider the whole eating experience before making food choices could result in healthier portions.

Pierre Chandon is the L'Oréal Chaired Professor of Marketing, Innovation and Creativity at INSEAD and the Director of the **INSEAD-Sorbonne Université Behavioural Lab**. Watch his **TEDxINSEAD** talk on Epicurean nudges.

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