

# What happens in your brain when you make a decision? New research may soon shed light

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Annika Wallin is interested in everyday decisions and believes that it is an important key to analyzing how people think about decisions and decision-making. Credit: Kennet Ruona

You rush into the supermarket; your mother-in-law is coming for dinner.

But which products end up in your shopping basket and why? Researchers have previously tracked eye movements to understand which products attract you in a shop. In order to get closer to the truth, they now want to use new computational models in which the brain's cognitive processes also play a major role.

As you stand in the narrow aisle facing a shelf of various types of pasta, you make a decision and reach for the fusilli in the blue packaging. But what is behind this [decision-making](#) process?

In recent decades, researchers have started to look more closely at what we pay attention to when making a decision. However, much of the research has been conducted not in natural environments, but in laboratory settings. If you can choose from among five different chocolate bars, which one do you choose? Eye-movement tracking has enabled us to understand the consumer's visual attention but now researchers want to gain even more insight by also analyzing how [eye movements](#) are linked to our preferences and the way memory is structured.

"We are interested in actual decisions, which are based on what individuals themselves want; interpreting this kind of data suddenly becomes a completely different matter as the chocolate cake that you consider the most delicious in the world is not the best for someone else. In research, we need to take a step backwards," says Annika Wallin, associate professor of cognitive science at Lund University, who has long been interested in how and why consumers make their decisions.

## **What ends up in the shopping cart?**

For several years, Wallin and her research colleague Kerstin Gidlöf, holder of a Ph.D. in cognitive science from Lund University and expert in consumer behavior, have investigated how we make decisions in real

environments, especially in ordinary grocery shops. They equipped shoppers with special glasses to register their eye movements as they went about their ordinary shopping round. What did customers look at and what ended up in their shopping carts?

The study examined not only how the products were displayed on the shelves or what color or shape they were, but the customer's own preferences as well. How much of a role does price play in my [choice](#) of products? Is it important to me that the product has a low sugar content or originates from a particular country?

When we enter the supermarket after a long workday, our steps are very much governed by the purpose of our visit. However hard the store tries to capture your attention with appealing products or large shelves full of the same type of goods, this competes with our own evaluation of the product. The wide shelf of coffee and tea products displays an incalculable number of packages. Am I attracted by the sleek design on a packet of coffee, the pricey organic tea from Sri Lanka or the special offer on a coffee brand from Gävle? Using a computational model for attention and memory, the researchers want to analyze the extent to which the selection of a product corresponds to the battle between external visual factors and what customers themselves consider important.

## **Development of a model**

The research team also includes Christian Balkenius, professor and pioneer in cognitive science, and Trond Tjösheim, doctoral student in cognitive science, both at Lund University. Together with Annika Wallin and Kerstin Gidlöf, they use a model that shows how cognition is organized and how attention and memory processes work. With funding from eSENCE, one of Lund University's strategic research areas, the researchers can start examining how to technically develop the model.

What happens inside the brain? This work requires both a supercomputer and patience.

"From our previous research, we now have a large amount of data and many components that can be combined. Every time you look at something in the store, we have a data point in our experiments regarding human behavior on site. We are interested in the interaction between internal and external factors."

The researchers hope that this complex and unique experiment data will show whether certain factors determine what happens inside the [brain](#) when a decision is taken, which would then enable them to conduct follow-up investigations.

"The visual clutter in a shop has not previously been linked to evaluations and decision-making. This research is an important puzzle piece in the process of understanding that decisions aren't taken in a vacuum but in complex environments," explains Annika Wallin.

She has long been interested in our everyday decisions that are frequently taken and therefore well-practiced; she believes they are an important key to analyzing how people think about decisions and decision-making.

"As researchers, we need to develop the intersection between the internal and external factors that underpin a choice. What actually happens when you are going to buy pasta, what happens to the physician meeting a patient, how do we take in facts about COVID-19? Humans are complex beings and there is a lot around us that affects us as individuals. I want to increase my understanding of that dynamic."

Provided by Lund University

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