Eyetracking technology knows your subconscious pizza desires… or not

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You're a vegetarian? But your subconscious ordered the Meat Lover's! Credit: BrokenSphere, CC BY-SA

If you prefer to order your pizza without going through all the trouble of actually speaking, Pizza Hut has just the thing for you—"the world's first subconscious menu." You sit down, glance through the menu, and before you say anything or even make a conscious decision, the menu has

figured out which toppings you'd like on your pizza and places your order. Pizza Hut began testing the technology in some of their UK restaurants this fall.

This mind-reading menu fuses a tablet computer with an eyetracker. The eyetracker measures your eye movements while you scan through 20 toppings, and decides which of the 4,896 possible combinations you want by measuring the amount of time you spend looking at each one. The tablet lets the diners know what it thinks they want – and waits for conscious approval – before sending the order to the kitchen.

Sounds great for the indecisive pizza lover. But is there anything to this "subconscious menu" besides marketing gimmickry?

The science of eyetracking

Eyetracking technology itself is real. Louis Émile Javal first used eyetracking to study reading in the late 19th century, and cognitive psychologists today rely on eyetracking to investigate basic processes like attention, perception, memory, and decision-making.

Modern eyetracking is based on high-speed cameras and graphics processors that measure infrared light reflected from the corneas of the eyes. The processor uses the reflected light to find landmarks like the center of the pupil and the bright patch that gives us the twinkle in our eye. As a person gazes in different directions, the relationships between these landmarks change, and these changes can be used to determine where a person is looking.

Eyetracking is now used as a tool for understanding topics ranging from dyslexia to distracted driving while texting. Cutting-edge cognitive neuroscience research even combines eyetracking with brain imaging to study the neural systems that underlie human thought.

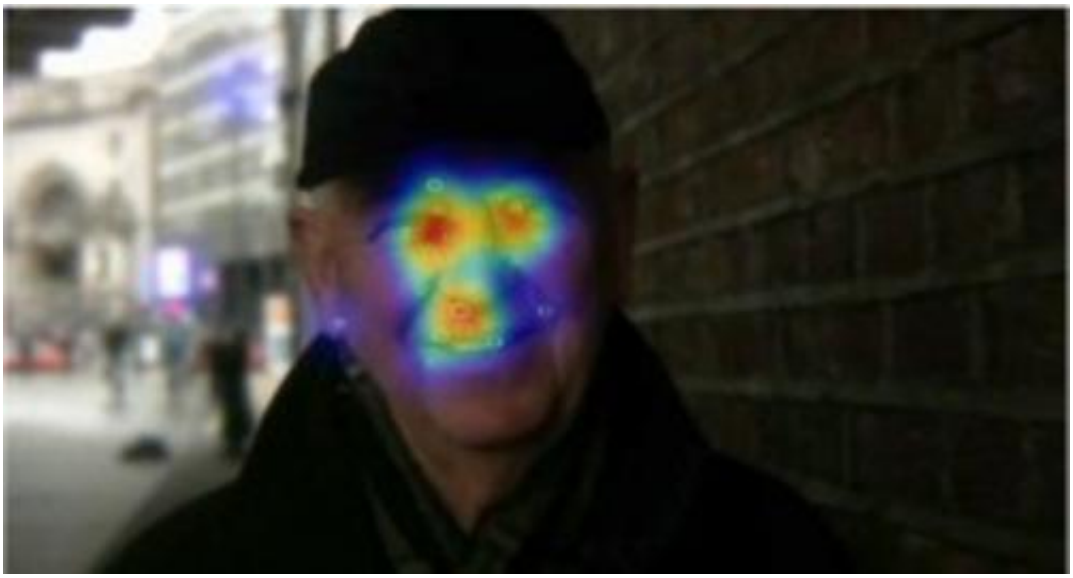
Eyetracking was once expensive and reserved for the well-funded science lab, but in the last couple of years the technology has become widely available. Today, good eyetracking systems can be had for less than a couple of hundred dollars.

Out of the lab, into the pizza parlor

Touchscreen tablet technology – without the addition of the eyetracking feature – is already in place in a number of restaurants and retail shops, allowing patrons to place orders without interacting directly with human beings.

But can eyetracking really be used to measure unconscious pizza preferences? Well… yes and no. The general idea that looking time reflects preference is based on good science; looking time can reflect many aspects of decision-making and thinking. But this relationship is probabilistic rather than certain. That is, we may spend more time on average looking at things we prefer compared to things we don't (all else being equal, which is rare in the real world), but for any given item or set of items, there's no guarantee that a longer look means greater preference. The upshot is that although people on average may look longer at things they like, we cannot use looking time to predict with any certainty what a specific person likes in a specific situation.

Another challenge for mind-reading via eyetracking is that people are complicated. There are many reasons you might look at different pizza toppings for different amounts of time. Maybe the picture of the pepperoni is harder to identify than the picture of the mushroom. Maybe the pile of pepperoni looks like your favorite Uncle Zach. Or maybe the pepperoni is just brighter on the screen. Any or all of these differences and many others can influence where and how long you look – far outweighing any subconscious preference for pepperoni.



Eyetrackers can show where an observer focuses his attention when looking at a face. The red areas were looked at the most. Author provided

So, unless you'd be happy ending up with an onion and pineapple pizza with corn on top, you might want forgo the subconscious menu and stick to a more traditional way to order.

One reliable way to order via eyetracker

There is one way in which eyetracking could be used more or less flawlessly to order from a menu. The menu could be set up so if you purposefully stare at each item you want for an unambiguously long period of time – probably seconds – then those items would be selected.

This type of system based on conscious eye movements actually does work. And indeed, systems like this can provide an important computer interface for people who cannot physically use a keyboard or mouse. But because these systems need a relatively long look at each item, most

people find them cumbersome and annoying. Why stare at a picture when you can just talk? After all, how hard is it to say "pepperoni"?

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