# Quitting marshmallow test can be a rational decision

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(Medical Xpress)—A psychological experiment known as "the marshmallow test" has captured the public's imagination as a marker of self control and even as a predictor of future success. This test shows how well children can delay gratification, a trait that has been shown to be as important to scholastic performance as traditional IQ.

New research from University of Pennsylvania psychologists suggests, however, that changing one's mind about delaying gratification can be a rational decision in situations when the timing of the payoff is uncertain.

The research was conducted by assistant professor Joseph Kable and postdoctoral researcher Joseph McGuire, both of the Department of Psychology in Penn's School of Arts and Sciences.

The study was published in the journal *Psychological Review*.

In the classic marshmallow test, researchers give children a choice between one marshmallow and two. After the children enthusiastically choose two, the experimenter says that they need to leave for "a few minutes" or "a little while." The children are also told that, if they can hold off eating the one marshmallow until the researcher returns, they can have the two marshmallows they prefer. With the children left alone in the room, hidden cameras track how long they resist temptation. Most try to wait but end up caving within a few minutes.

"The kids' responses seem illogical—if you decided to wait in the first

place, why wouldn't you wait the whole way through?" Kable said.

This behavior was an intriguing puzzle for Kable; he studies how people make value-based decisions, especially when they require comparing the value of something in the present with something else in the future. But, in conducting his own variants of the marshmallow test, he found that a key fact had been glossed over in both popular and academic discussions: the children don't know how long they will have to wait.

"I didn't even know that there was uncertainty in the marshmallow test until we started trying to do that type of experiment ourselves on adults and weren't getting any interesting behavior," Kable said. "That the kids don't know how long it's going to be until the researcher returns changes the entire decision problem!"

This confusion may stem from the explanations provided for children's decisions in the marshmallow test. Some of the researchers who have employed the marshmallow test and its variants have hypothesized that participants' decision to eat the marshmallow could be attributed to a strong impulse overriding the original decision to wait, or that the ability to wait was drawing on a reserve of self control that is depleted over time. Since these hypotheses make the same predictions even when there is no uncertainty, the uncertainty was often downplayed.

Kable and McGuire's analysis of data from earlier marshmallow-test studies showed problems for these hypotheses, however. If reversing the decision to wait was a function of the wearing down of self control, the time at which children eat the first marshmallow should be clustered in the middle or towards the end of the waiting period. Instead, children who gave up waiting tended to do so within the first few minutes.

After this analysis, Kable and McGuire did their own survey-based research to see how people estimate the lengths of waiting times in

different situations.

The researchers asked participants to imagine themselves in a variety of scenarios, such as watching a movie, practicing the piano or trying to lose weight. Participants were told the amount of time they had been at the activity and were asked to respond how long they thought it would be until they reached their goal or the end.

The results showed a marked difference between the scenario with a relatively well-defined length and those that were more ambiguous.

"Our intuition is that when we are waiting for something, the longer we wait the closer and closer we get to that thing, which is what we see when we ask people about familiar things, like how long a movie will last," Kable says. "But what we've found is that, if you don't know anything about when the outcome will occur, the longer you wait the more you think you're getting farther and farther away from that outcome."

While the marshmallow test remains a good predictor of who is better or worse at delaying gratification, Kable's research suggests the mechanism behind that ability needs to be reinterpreted. It may also suggest some tools and techniques people can use to improve self control, or at least become aware of situations where delaying gratification will be particularly challenging.

"This is exciting to us because it suggests a way to get people to persist to the end," Kable said. "Your previous experience and your expectations can change your behavior, so you need to give them experiences that provide them with the right kinds of expectations."

**More information:** psycnet.apa.org/index.cfm?fa=s … ID=1&page=1&dbTab=pa

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