

# Study shows willpower traits appear to be lifelong for some people

August 30 2011, by Bob Yirka

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(Medical Xpress) -- In an interesting and unique study, researchers have followed up on an experiment conducted several decades ago designed to point out the varying levels of willpower in nursery school age children. Back then, the children were given either a marshmallow or cookie and told if they held off eating it, they'd get another a little while later when the researcher returned. Now adults, some of those original subjects have been tested again, this time using reactions to faces in photographs instead of an edible treat; and lo and behold, even after forty years, the results were very nearly the same. Those that showed willpower as youngsters, did so again as adults, while those that showed little willpower back then didn't appear to gain any in the interim. The team, led by B.J. Casey and comprised of psychology researchers from a variety of universities, has published the results of their study in the *Proceedings of the National Academy of Sciences*.

In the original study, 500 children at Stanford University's Bing Nursery school took part in the experiment conducted by Walter Mischel; in the new study, 59 of the original participants were asked to volunteer again. Though in the second go round, rather than being offered sweets the participants were asked to look at a computer screen displaying a slide show of people's faces. Some of the expressions on the faces were happy, some were unemotional, and some were clearly unhappy. The participants were asked to push a button when the happy faces were shown, the idea being that grownup people tend to gravitate towards people who are happy and smiling, and thus want to push that button.

In monitoring the button pushing and comparing it to the actual images on the screen, the researchers were able to see that some of the volunteers had more trouble keeping themselves from pushing the button even when the face they were looking at wasn't smiling or looking happy; a result the team says, that shows a lack of willpower. And as it turned out, those showing the most difficulty in holding their buttons still for the less than happy pictures were the same people who as nursery school children, chose to eat the first cookie, rather than wait so they could have a second.

The team also managed to get brain scans of 26 of the participants and found differences in the parts of the brain that is normally associated with desires and rewards, which backed up their findings.

The team points out in their paper that the volunteers chosen from the original group were those who fell on the more extreme ends of the willpower scale as children and thus the results of the study might be skewed. They also point out that their numbers are meant to show averages for people and are not meant to imply that every person who demonstrates willpower, or a lack thereof, as a child, will be the same as an adult. Instead they suggest their results indicate possible trends and that further research on people whose [willpower](#) has changed over the years should shed more light on the subject and perhaps offer those who find themselves at the mercy of their whims some means of help.

**More information:** Behavioral and neural correlates of delay of gratification 40 years later, *PNAS*, Published online before print August 29, 2011, [doi: 10.1073/pnas.1108561108](https://doi.org/10.1073/pnas.1108561108)

## Abstract

We examined the neural basis of self-regulation in individuals from a cohort of preschoolers who performed the delay-of-gratification task 4 decades ago. Nearly 60 individuals, now in their mid-forties, were tested

on “hot” and “cool” versions of a go/nogo task to assess whether delay of gratification in childhood predicts impulse control abilities and sensitivity to alluring cues (happy faces). Individuals who were less able to delay gratification in preschool and consistently showed low self-control abilities in their twenties and thirties performed more poorly than did high delayers when having to suppress a response to a happy face but not to a neutral or fearful face. This finding suggests that sensitivity to environmental hot cues plays a significant role in individuals’ ability to suppress actions toward such stimuli. A subset of these participants ( $n = 26$ ) underwent functional imaging for the first time to test for biased recruitment of frontostriatal circuitry when required to suppress responses to alluring cues. Whereas the prefrontal cortex differentiated between nogo and go trials to a greater extent in high delayers, the ventral striatum showed exaggerated recruitment in low delayers. Thus, resistance to temptation as measured originally by the delay-of-gratification task is a relatively stable individual difference that predicts reliable biases in frontostriatal circuitries that integrate motivational and control processes.

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