As we all know, delaying gratification is an ability to overcome the current difficult situation and strive to obtain long-term benefits. Its benign development is a necessary condition for children to coordinate interpersonal relationships and successfully adapt to the social environment in the future. Thus, psychologist Mischel designed a canonical example—the marshmallow task, to reflect differences in self-control abilities. However, the researchers found that, apart from self-control abilities, it might be moderated by beliefs about environmental reliability. Based on rational decision-making hypothesis, they set up a group of control experiments about whether environment reliable or not, improving the marshmallow task. (We tested children using a classic paradigm—the marshmallow task (Mischel, 1974)—in an environment demonstrated to be either unreliable or reliable.) And finally, they proved that, to a large extent, kids' abilities of delaying gratification were impacted on the reliability of the environment. (We demonstrated that children’s sustained decisions are strongly influenced by the reliability of the environment.)

In the study, 28 children who had not visited the lab and interacted with researchers volunteered. There are two experimental conditions—unreliable and reliable, then children are distributed into the two groups equally. (Children were randomly assigned to one of two experimental conditions—unreliable and reliable—such that each group was gender and age balanced.)

The participant is required to finish two tasks, including Art project task and Marshmallow task.

Through the Art project task, children can get the reliability of the researcher by making two crucial decisions--whether to use the stuff they already have or to wait for a better one the researchers promised. (The stuff was first a set of crayons and then a sticker)In the reliable group, the researcher fulfilled their promise, while in the other group, they didn’t.

After the Art project task, it was the marshmallow task.(The marshmallow task immediately followed the two-part art task.) The researcher placed marshmallow in front of the children and told them they can choose to eat it right now or wait for more. All their behaviors were recorded.

In the last step, the videos was reviewed and children’s every movement including the first bite was recoded by two people having nothing to do with the experiment. (Two naïve coders (who were unaware of the experimental conditions) reviewed blinded videos of children in the marshmallow task and recorded when each child’s first taste—a lick or bite—occurred. ) A computer script was used to measure the degree of children’s movement.

After processing the original data, researchers have found results below.

Firstly, in the unreliable condition, children waited without eating for an average of 3 min and 2 s, and 1 of 14 waited the full 15 minutes. Conversely, they waited 12 min and 2 s averagely in the reliable condition, and there are 9 kids waiting entirely. This proved that children in reliable conditions wait much longer and probably more could wait till the end.(Thus, children in the unreliable condition waited significantly less than those in the reliable condition. Thus, children in the unreliable condition were significantly less likely to wait the full 15 min than those in the reliable condition.)

Secondly, linear regression performed suggested that gender and age have no significant influence to the waiting duration.(Additionally, we performed a linear regression with age and gender as predictors, controlling for condition. Neither factor-age nor gender was significant in our sample.)

Thirdly, through the video data of children, researchers tried to seek out the difference in contentedness, smiling and fidgeting. (We used three control variables to investigate the potential influence of mood on children’s wait times: contentedness, smiling, and fidgeting. Each measurement was based on a portion of each child’s video data—the first 30 s of the waiting period. ) According to the results, mood didn’t make a difference in these two conditions. (Results suggested that these variables did not vary systematically across the two conditions.)

It is inferred from the result of the study that children’s behavior in the marshmallow can be deeply affected by their rational decision-making process. This discovery overturns the previous theory that self-control plays the key role in children’s response during the experiment, since the differences of researchers’ reliability leads to different results.

It should be noted that with the variance of experimenters’ reliability, children’s delay-of-gratification in reliable conditions are 12.03 mins in average which is four times longer than those in unreliable conditions, while in former experiments, the average time of delay ranged from 5.73 to 6.03 mins.(When we manipulated experimenter reliability, children waited twice that long in the reliable condition (12.03 min), and half as long in the unreliable condition (3.02 min).)

The result doesn’t exclude self-control’s contribution to the phenomenon that children behaved differently in the experiment. (To be clear, our data do not demonstrate that self-control is irrelevant in explaining the variance in children’s wait-times on the original marshmallow task studies.) Accurately speaking, self-control and the judgement of reliability are working as one inseparable quality that causally implicated to children’s later life outcomes.

Reference:

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Rational snacking: Young children’s decision-making on the marshmallow task is moderated by beliefs about environmental reliability