Rewards are Better than Punishment: Here’s Why
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Many a child developmental professional will advise parents to try to ignore children's bad behavior and reward their good behavior. As most parents know, this is sometimes easier said than done. After all, bad behavior can be so irritating that it is difficult not to respond to, that is, to ignore. It takes real discipline.

Some parents might object to ignoring bad behavior because they see it, understandably perhaps, as their responsibility to correct the child's misbehavior. Ignoring it may seem like tolerating if not rewarding it and thus failing to do one's duty as a parent.

Despite how reasonable this sounds, it turns out that most experts, including of the Super Nanny variety, are correct. Rewards are more effective than punishment. And some Dutch neuroscientists have just found out why that seems to be the case. For more information see http://esciencenews.com/articles/2008/09/25/from.12.years.onward.... (cut and pasted on other side)

Their work involved 8/9- and 11/12-year olds who were given the opportunity to learn some basic tasks by means of positive, rewarding feedback or negative, "punishing" feedback. Specifically, all children were given a computer task which required them to discover rules and when they correctly inferred a rule, as revealed by choices they made in the task, a check--positive reward--appeared on the screen; but if their choice indicated that they had not correctly figured out the rule of the task, then a cross--punishment--appeared on the screen. Repeated running of the task showed that performance improved substantially more when the feedback was positive in the case of the younger children, telling them they did well when they did, rather than negative, telling them that they did poorly when they did. Just the opposite proved true in the case of older children, who functioned just like young adults aged 18-25 who were also tested. That is, negative feedback improved performance more for these individuals than did positive feedback.

Because the cognitive tasks central to this research were administered while the children and young adults were in a brain scanning machine, brain imaging revealed that brain areas responsible for cognitive control and located in the cerebral cortex seemed to play a role in why younger and older children learned so differently. That is, these brain control centers were more strongly activated in the face of negative feedback in the case of older children and adults, but more strongly activated when receiving positive feedback in the case of younger children. It is almost as if for the younger children positive feedback registered more strongly, whereas for the older children, just the opposite proved true.

Why might this be so? If you think about it for a moment, as the investigators did, it becomes apparent that information which stipulates that you did something wrong is more complicated than information stipulating that you did something well. So younger children may simply have an easier time processing simpler, positive, rewarding information than negative feedback. As the authors noted, "Learning from mistakes is more complex than carrying on in the same way as before. You have to ask yourself what precisely went wrong and how it was possible." That is, it takes more analysis to figure out that what was done is mistaken than that it is correct.

What still remains unknown is exactly what accounts for the change in brain functioning and how it occurs. Do new connections within or between brain regions emerge during the transition to adolescence? Do hormones associated with puberty play a role? Like all good research, this elegant work raises new questions at the same time it reveals new things.

But the bottom line seems to be that we now have a better idea why rewards work better than punishment with pre-adolescent children. So if it is an explanation you need for why you should reward good behavior more than punish bad behavior, at least with pre-adolescent children, now you have one. The task that still remains, of course, is regulating one's own irritability, frustration and thus behavior in the face of annoying child behavior so that we can ignore it.
From 12 years onward you learn differently

Source: Leiden University

Eight-year-old children have a radically different learning strategy from twelve-year-olds and adults. Eight-year-olds learn primarily from positive feedback ('Well done!'), whereas negative feedback ('Got it wrong this time') scarcely causes any alarm bells to ring. Twelve-year-olds are better able to process negative feedback, and use it to learn from their mistakes. Adults do the same, but more efficiently.

Brain areas for cognitive control
The switch in learning strategy has been demonstrated in behavioral research, which shows that eight-year-olds respond disproportionately inaccurately to negative feedback. But the switch can also be seen in the brain, as developmental psychologist Dr Eveline Crone and her colleagues from the Leiden Brain and Cognition Lab discovered using fMRI research. The difference can be observed particularly in the areas of the brain responsible for cognitive control. These areas are located in the cerebral cortex.

Opposite case
In children of eight and nine, these areas of the brain react strongly to positive feedback and scarcely respond at all to negative feedback. But in children of 12 and 13, and also in adults, the opposite is the case. Their 'control centres' in the brain are more strongly activated by negative feedback and much less by positive feedback.

Three-way division
These research results are reported in The Journal of Neuroscience dated 17 September. Crone and her colleagues used fMRI research to compare the brains of three different age groups: children of eight to nine years, children of eleven to twelve years, and adults aged between 18 and 25 years. This three-way division had never been made before; the comparison is generally made between children and adults.

Unexpected
Crone herself was surprised at the outcome: 'We had expected that the brains of eight-year-olds would function in exactly the same way as the brains of twelve-year-olds, but maybe not quite so well. Children learn the whole time, so this new knowledge can have major consequences for people wanting to teach children: how can you best relay instructions to eight- and twelve-year-olds?'

Ticks and crosses
The researchers gave children of both age groups and adults aged 18 to 25 a computer task while they lay in the MRI scanner. The task required them to discover rules. If they did this correctly, a tick appeared on the screen, otherwise a cross appeared. MRI scans showed which parts of the brain were activated.

Learning in a different way
These surprising results set Crone thinking. 'You start to think less in terms of 'good' and 'not so good'. Children of eight may well be able to learn extremely efficiently, only they do it in a different way.'

Learning from mistakes is complicated
She is able to place her fMRI results within the existing knowledge about child development. 'From the literature, it appears that young children respond better to reward than to punishment.' She can also imagine how this comes about: 'The information that you have not done something well is more complicated than the information that you have done something well. Learning from mistakes is more complex than carrying on in the same way as before. You have to ask yourself what precisely went wrong and how it was possible.'

Is it experience?
Is that difference between eight- and twelve-year-olds the result of experience, or does it have to do with the way the brain develops? As yet, nobody has the answer. 'This kind of brain research has only been possible for the last ten years or so,' says Crone, 'and there are a lot more questions which have to be answered. But it is probably a combination of the brain maturing and experience.'

Brain area for positive feedback
There is also an area of the brain that responds strongly to positive feedback: the basal ganglia, just outside the cerebral cortex. The activity of this area of the brain does not change. It remains active in all age groups: in adults, but also in children, both eight-year-olds and twelve-year-olds.

Question
Based on the information in these articles and what you have learned during this unit, give me some situations when it would be best to use reinforcement. How about punishment? Be ready to explain why.