Happiness: Why learning, not rewards, may be the key

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Learning is rewarding. Credit: BalanceFormCreative/Shutterstock

Our obsession with happiness isn't as modern as it may seem. Philosophers from Aristotle to Jeremy Bentham have all argued that subjective wellbeing is crucial. Bentham even suggested that "it is the greatest happiness of the greatest number that is the measure of right and wrong". This approach informs the policies of many nations who deploy population measures of wellbeing.

But the goal of increasing societal happiness has proved difficult to achieve. This is in part because it is difficult to determine what factors are most relevant for happiness. For example, many people believe they would be happier if only they had more money, but events such as winning the lottery or receiving a large pay raise often only have temporary effects on happiness. Instead, our recent study, published in eLife, suggests that learning may play a more significant and enduring role.

Another recent study suggests that the main factor driving happiness when it comes to rewards is not actually the rewards themselves but instead how well a reward matches up with expectations. Receiving a pay raise will make you feel happier only if it was bigger than what you had been expecting. This difference between an expected and an actual reward is referred to as a reward prediction error.

Reward prediction errors play a key role in learning. That's because they motivate people to repeat behaviors that led to unexpectedly large rewards. They can also be used to update beliefs about the world, which might be rewarding in itself. For example, if you get a bigger pay rise than you expected because you made a big effort to negotiate with your employer, you will realize that this is a helpful approach that you should stick with. It may also feel like you've earned it.

So could it be that reward prediction errors are associated with happiness not because of the rewards, but instead because they help us understand the world a little better than before?

The experiment

In our recent study, we tested this idea. We designed a task in which the likelihood of receiving a reward was unrelated to the size of the reward, enabling us separate out the contributions of learning and reward in

determining happiness.

Seventy-five participants got to play a game which involved deciding which of two cars would win a race without prior knowledge about them. In the "stable" condition, one of the cars always had an 80% chance of winning. In the "volatile" condition, one car had an 80% chance of winning for the first 20 trials. The other car then had an 80% chance of winning for the next 20 trials. The volunteers were not told these probabilities in advance but had to figure it out by trial and error while playing the game.

On every trial, the volunteers were shown the reward they would receive if the car they chose went on to win. Potential prizes were randomly assigned to the two cars. Making good choices required considering both the potential rewards and the probability of winning (you'd obviously want to win huge amounts often). But the size of rewards was not useful for learning which car was more likely to win in the future.

Every few trials, the volunteers were asked to move a cursor to indicate their current level of happiness. Not surprisingly, the volunteers were happier after winning than after losing. On average, they were also less happy in the volatile compared to the stable condition. This was especially true for volunteers who reported symptoms of depression.

The biggest surprise was that happiness did not depend at all on the size of rewards. Instead, momentary happiness depended on whether outcomes were better than expected—so that the cars did even better than the participants had thought. This helped participants update beliefs while ignoring information about the size of rewards. In other words, it was the process of learning how the game worked which made people feel good rather than the amount of reward they win.

The benefits of learning

These results suggest that how we learn about the world around us can be more important for how we feel than rewards we receive directly. It makes sense when you consider that learning is often considered as being intrinsically rewarding—whether it is a language, historical facts, Sudoku or a computer game. That is, people seek out learning opportunities and enjoy learning them even if it does not clearly result in material gain. This is backed up by the fact that nobody enjoys playing very easy games or unsolvable games, which in both cases provide little in the way of learning opportunities. Instead, we enjoy playing challenging games that we can learn to master.

Finding regular opportunities to learn may therefore be important for wellbeing. In fact, research shows that the motivation to perform an intrinsically rewarding activity, such as solving a problem, can actually be undermined when a reward (such as a payment) is introduced. In the real world, rewards are often uncertain and infrequent, but the good news is that learning may nevertheless have the potential to boost happiness.

Our study also raises important questions about why some people are worse at dealing with uncertain situations than others, such as those with depression. Further research is needed to understand why this might be the case. To that end, we developed a smartphone app (The Happiness Project) that anyone can download for free to contribute to scientific research on happiness.

This huge citizen science project includes games in which you learn and make decisions and report how happy you feel as you play them. Anonymous surveys help us understand the differences between people and might help to explain what happens in common conditions such as anxiety and depression. There is still a lot to learn about happiness—and everyone can contribute.

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