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What the "Trolley Problem" says (or doesn't) about human nature

By Nathaniel Bohm-Levine
Illustration by Mikaila Hoffman

Can your response to a single scenario predict your day-to-day decisions? Can it predict how you decide when saving a life is—to put it bluntly—worth it? To put this question to the test, we will examine a classic philosophical thought experiment known as the "trolley problem." Introduced by philosopher Philippa Foot in 1967, the dilemma goes something like this: imagine you are walking by a train track, when out of nowhere you notice a runaway trolley with failed brakes. Several yards from the trolley's path are five people who are helplessly tied to the tracks. In front of you is a switch that would divert the path of the trolley, but doing so would cause the trolley to hit and kill someone who happens to be crossing the sidetrack. What do you do?

In strict utilitarian terms, the clear choice would be to save the life of five at the expense of one. Utilitarianism, a subset of the philosophical framework known as consequentialism, is a school of ethics that can essentially be summarized as "the ends justify the means." In the flip-switching scenario, people typically side with the utilitarians—repeated studies have found that an average of ninety percent of respondents will choose to divert the trolley's path if it means saving five.

You can intensify the situation by introducing a complication to the problem (this variation is sometimes called the "Fat Man," regrettably): you are now standing on a footbridge above the track, observing the trolley as it nears the five victims. There is a large man standing along the bridge's railing; his weight would unquestionably stop the trolley in its tracks. Of course, if the man were pushed over, he would be immediately killed. Do you push him?

Again, if utilitarian considerations were all people cared about, the decision would be easy: act and kill one, do nothing and five die. Yet in this case, polls show that a clear majority will choose not to act, even though like last time, saving the five justifies killing the one. Perhaps people are now acting under a different philosophical framework, one where the individual has greater value. This framework is known as deontology, which simply put is the belief that there are intrinsic "right" and "wrong" actions. Under deontology, no degree of lifesaving is worth an act as perverse as murder.

Faced with the switch, most decide to kill, but when confronted with pushing the man off the bridge, most choose inaction. Why do people follow a utilitarian framework in one scenario, but a deontological one in another? How—suddenly—do the ends no longer justify the means?

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Unsurprisingly, philosophers, psychologists, and most recently cognitive neuroscientists have swarmed over this phenomenon. Spanning the last several decades, the field of "trolleyology" has taken off, and a variety of explanations or solutions to the trolley problem have been offered (if it's any indication of its omnipresence, current trainees at West Point take courses on trolleyology in preparation for a career in military ethics). Researchers have posed a variety of variations and manipulated conditions, all to ask: When and why do we choose to flip the switch?

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A number of interesting findings regarding the trolley problem have appeared over the years: people choose not to flip the switch when the one killed on the other track is a loved one or romantic partner. Men might be more likely to push the large man over, and might even possess a greater tendency to flip the switch. Watch a comedy clip before being polled and you're more likely to push the man off the bridge; watch a tedious historical documentary and those odds go down. After surveying 103 bar-goers in Grenoble, France, researchers found a high blood alcohol content was correlated with an increased propensity for flip-switching. Does a career in philosophy make a difference? Surprisingly, no: professional philosophers respond to the dilemma in the same manner regardless of their level of education—or even their previous knowledge of the trolley problem.

Now, to complicate the situation even further: What if your own weight were enough to stop the trolley? Would you throw yourself over the bridge? Researchers at the University of Michigan found that people are more likely to choose sacrificing themselves over the innocent bystander.

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What do all of these results tell us about human nature? Not much, perhaps ("I don't do trolleys," as one famous philosopher has exclaimed). Situations like the trolley problem rarely occur in day-to-day life, and few have the luxury to sit and muse on some theoretical moral quandary.

In an effort to connect these findings to a slightly more "real-world" scenario, researchers at Michigan State University placed participants in virtual reality headsets and had them pull (or not pull) a real switch as they observed a box car hurtle towards five realistically animated people, who even screamed as the box car neared. Even with the added motivator of five virtual deaths, the results were nothing new: most would flip the switch; most would abstain from the push. Still, no one could conclude from this contrived situation that it irrevocably represented the response from a typical human who is put into the situation.

However, for answers as to why most people respond to the trolley problem the way they do, maybe academics were looking in the wrong places. Maybe the key to understanding comes from a key feature of human nature that most philosophers had neglected: emotion.

Following this lead, a team of researchers at Princeton, led by Joshua Greene, used functional magnetic resonance imaging to discern brain activity while people read and considered two ethical dilemmas: the traditional version of the trolley problem and the "footbridge" variation. There are obvious differences between the two scenarios: one allows the person a certain degree of removal from the situation, while pushing someone over a bridge is violent and unavoidably visceral—what cognitive scientists might call "emotionally salient."

In the body-pushing scenario, areas of the brain that had previously been found to be involved during times of sadness or fear—medial prefrontal cortex, posterior cingulate, and amygdala—became active as participants mulled over their decision. These areas of activity did not appear in the other trolley scenario, which actually showed relatively more activity in two classically "cognitive" brain regions, the dorsolateral prefrontal cortex and inferior parietal lobe. Greene and his colleagues concluded that our brains recruit emotional processing when faced with "up close and personal" scenarios. This emotional system must then override our more rational brain decision-making regions when presented with situations that are intensely personal.

This interplay between two decision-making systems in our brain—a rational set of cognitive processes versus a set of emotional ones—reveals itself in the reaction time of the participants. When faced with the decision to push the man off the bridge, those who responded "yes" took longer to respond than those who said "no"—while the "yes" participants eventually decided on the utilitarian outcome, they had to overcome an initial tendency towards the deontological decision triggered by the emotional system. In contrast, for those who were faced with flipping a switch in the original version of the trolley problem, people responded "yes" just as fast as "no."

It might seem abstract, but the trolley problem has its real-life counterparts: the decision to drop the atomic bombs at the end of World War II was rationalized by arguing that a quick end to the war would save lives in the long run. And the decision to torture suspects connected to terrorist plots is influenced by a belief that the harm of one does not outweigh the potential safety of hundreds or maybe thousands of individuals. Deciding whether to save the many at the expense of few is not just an isolated, armchair-philosophy dilemma: understanding moral decision-making gives us key insights into the deepest of human tendencies across time.

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