

Imagine a world in which everything you plan is bound to happen. If those future events are positive, it would be a perfect world. However, the reality is different. The realization of future plans and events is uncertain, because one property of the future is uncertainty. That is why, in our research, we investigate how people make decisions when the future is uncertain. In other words, we describe the human decision-making process when our choices refer to delayed lotteries, i.e. delayed and risky gains and losses.

For example, which route should I take on my way home from work depending on the odds of high traffic and travel time? Which investment should I pick, taking into account that each of them have different expected time of return and probability of success. No matter how important our decisions are, making them is inevitable. Those decisions most often depend on both the delay and probability of the occurrence of their consequences. Rarely it is solely either just the expected delay or probability of success that drives our decisions. In our example, when considering a potential investment, it would be inefficient to take into account either just the odds of success or just the time of its expected return. Likewise, taking into account just the risk of traffic or just the expected time of travel would prove insufficient to get back home from work before the dinner gets cold.

Our question stands: what happens with our decisions, when their consequences are not only delayed but also uncertain? In other words, we aim to investigate the process of decision making with positive and negative consequences that are at the same time delayed and uncertain. In our research, we combine theories and methods from economy and psychology to investigate the way we think about the uncertain future. We go one step beyond existing research, which mainly focused on choices that are either just delayed or just probabilistic. In order to do that, we observe how participants choose between different options involving gaining or losing hypothetical sums of money with varying degrees of delay and probability. This allows us to understand how delay and probability of expected gains and losses affect our decisions, and – ultimately – to describe this process mathematically.

We study the fundamental processes of decision making to further the scientific knowledge about what exactly people base their decisions on in situations that can be described as delayed lotteries. Understanding this is also important because maladaptive intertemporal and risky choices underlie many societal problems, such as addiction, obesity, gambling, and even environmental protection.