Marketing SARS-CoV-2 Vaccines: an Opportunity to Test a Nobel Prize–Winning Theory

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The rapid development of vaccines against SARS-CoV-2 is a dazzling achievement. Yet, widespread vaccination of the world’s population is a feat that is no less daunting. Along with overcoming significant logistical hurdles, gaining public acceptance is crucial. Nearly 150 million adults in the USA had received at least one dose of SARS-CoV-2 vaccine by the end of April 2021.1 Yet, surveys show that as many as 30 to 40% of adults may refuse to be vaccinated in some states.2,3 Hesitancy is rooted in doubt about the need for vaccination or its effectiveness, fear of vaccine safety, and belief in freedom of choice.4 Underlying these concerns is a mistrust of vaccine manufacturers and promoters, exacerbated in some countries by politicization of the pandemic. Solutions must address a broad range of issues, including organizational logistics, equitable access, cultural and social factors, and systemic racism. Strategic public health messaging can be informed by insights from behavioural economics that people’s decisions may be affected by the way choices are framed.

Tversky and Kahneman5 demonstrated how framing influences the choices we make. The following scenario is adapted from one of their seminal studies. Imagine a flood where 600 people are expected to die. Study participants must choose between two rescue options: Build a boat that holds and will save 200 people, or build a dam that has a 33.3% chance of holding back the flood and saving all 600 people. In the original experiment, 72% of participants chose the equivalent of the dam. The second group was presented the same options, framed differently: build a boat that ensures 400 people will die, or build a dam that offers a 33.3% chance that no one will die. Here, 78% of study participants preferred to gamble, opting for the equivalent of the dam. In this case, where the probability of either gain or loss was relatively high, framing choices as “gains” (lives saved) made people risk averse, while framing them as “losses” (deaths) induced people to take risks. Perhaps even more fascinating is that the tendency to be risk averse or risk seeking is flipped when the probability of an outcome is low5 (see Table). People seek risks for low probability gains (like buying lottery tickets) and are risk averse for low probability losses (which is why they buy property insurance).6 These observations are a central component of prospect theory,7 for which Kahneman was awarded the Nobel Prize in 2002.

Both gain and loss frame messaging have been used to promote vaccination. The CDC’s influenza vaccine campaigns have used slogans like “get a flu vaccine to protect yourself, your family, and your community” (gain frame) and “each year, millions of children get sick with seasonal flu and thousands of children are hospitalized, #fightflu” (loss frame).8 Prospect theory suggests that gain and loss frame messages could be deployed strategically to promote SARS-CoV-2 vaccination depending on how the target audience perceives the relative risks and benefits of vaccines, as well as their self-perceived risk of suffering severe consequences of COVID-19 (Table 1).

The powerful effects of framing are evident in politics and marketing. Two famous loss frame messages have shaped recent history (“Make America Great Again” (Trump) and “Take Back Control” (Brexit)) by reminding their audiences of all they believe they have lost. However, randomized controlled trials of framing incentives9 and framing communication10,11 to promote health behaviour have been underwhelming.12 There remains little definitive empirical demonstration that framing works in health; the jury is still out on whether this theory really works. This may be because prospect theory is sometimes misapplied or misunderstood.13 For example, the term “risk” as considered by Tversky, Kahneman, and their collaborators refers to uncertainty but has frequently been misinterpreted to mean the potential for a bad outcome. To be truly based on prospect theory, framing interventions must consider perceptions of uncertainty related to either positive or negative outcomes, not just the chance of negative outcomes occurring (see Table 1). SARS-CoV-2
vaccination campaigns offer an important opportunity to test message framing strategies under real-world conditions. Most people perceive that SARS-CoV-2 vaccination carries a high probability of benefit and a low probability of side effects. Prospect theory predicts that these people will be more risk averse (see Table 1), so public health messages aimed at them should use gain frame messages to emphasize the safety and benefits of vaccination.

However, other people perceive SARS-CoV-2 vaccination to carry a high probability of serious side effects, in part due to sensational media coverage of rare reactions. Many of these same people believe their chance of suffering severe illness from COVID-19 is low. In this circumstance, prospect theory predicts that people will be risk seeking (see Table 1), preferring to take a risk if the alternative is a certain loss. For these groups, campaigns could use loss frame messages to highlight the certainty of accumulating fatalities and prolonged restrictions on economic and social activity in an ongoing pandemic.

While loss frame messages may be powerful, negatively oriented messages may also have undesirable consequences where trust is already tenuous. Vaccine communication must be sensitive to the history of scientific abuses in racialized and other minority communities. People need to believe that those encouraging vaccination are acting in their best interests. Hesitancy and confidence related to vaccination are complicated issues that are influenced by many factors. Framing interventions represent only one potential component of a multi-faceted strategy to encourage vaccine uptake. Employing trusted advocates from within communities, using linguistically and culturally specific media and social platforms, and ensuring diverse representation are all important to ensuring vaccine uptake.

Vaccine hesitancy does not exist only in racialized or minority communities and it must not be used as an excuse to ignore structural and systemic factors that hinder vaccination. Studies show loss framing is effective when people have self-efficacy, confidence in their ability to undertake the healthy behaviour. For example, negative messaging regarding the health consequences of smoking may not be effective in people who have unsuccessfully tried quitting multiple times. Two small randomized trials showed that tetanus vaccination was increased by loss frame messages only when they were coupled with specific messages promoting the ease of vaccination. Similarly, loss frame messaging that emphasizes the importance of SARS-CoV-2 vaccination must be paired with free and equitable access to vaccines, which is conveyed to the public with empowering messages and specific instructions about how to be vaccinated. Vaccination efforts must remove systemic barriers, such as online-only appointment booking which disadvantages those without ready access to broadband internet, computers, and time to navigate web services to find an appointment. Without equitable access, loss frame messaging risks further alienating marginalized and vulnerable groups.

Framing of risk may have also influenced the debate about delaying the second dose of SARS-CoV-2 vaccines. This departure from the randomized trial protocols and regulatory body-approved dosing schedule was proposed to maximize early vaccination with limited vaccine supply. Those who argued for the off-label strategies focused on avoiding as many deaths as possible (loss framing). When faced with a high probability of serious side effects, risk-seeking people are more likely to prefer the certainty of taking a vaccine, so risk seeking favors vaccination. Reinforce risk averse preference, which favors vaccination.
probability of loss, they were willing to accept the risk that vaccines won’t work as well for individual people as in clinical trials. The other side was focused on the individual benefit of vaccination (among other concerns like possible mutation and ultimate public acceptance). When contemplating a high probability of individual gain, they were risk averse and did not want to take the chance that vaccines would be less effective if not administered per protocol. The power of loss frame messaging, which often evokes fear of missing an opportunity, may help explain in part why the proponents of delayed dose persuaded some policy-makers. Ultimately, vaccine supply constraints led to many jurisdictions opting for a “first dose” strategy and delaying the second dose beyond the trial protocols.

The world is embarking on the largest single vaccination effort in human history. We should not miss out on a unique opportunity, may help explain in part why the proponents of delayed dose persuaded some policy-makers. Ultimately, vaccine supply constraints led to many jurisdictions opting for a “first dose” strategy and delaying the second dose beyond the trial protocols.

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Declarations:

Conflict of Interest: Dr. Detsky is member of the Telus Medical Advisory Council for pandemic planning, a member of the Scientific Advisory Body of Bionde, and owns equity in Pfizer, Astra-Zeneca and Johnson and Johnson.

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