



# Framing Effects Under the COVID-19

## A Review of Application in Framing Messages and Decision-making

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### ABSTRACT

The aim of this paper is to illustrate and summarize the role of framing effect under the COVID-19 pandemic with regards to three applications: vaccine promotion, general restrictive policy proposed by governments, and guidelines for older adults. Current studies for this issue are mostly about the effect of framing messages regarding separate individual aspects, with a focus on comparing the effectiveness of gain and loss-framed health messages. Overall, studies found that loss-framed messages seemed to work better in COVID-19 vaccine promotion and guidelines for older adults. Inconsistent results are presented in people's responds toward government restrictions, but no matter which one works better, framing effects are proved to be crucial and effective in informing people about the risks and importance of self-protection under the COVID-19 epidemic.

**Keywords:** *Framing effect, COVID-19, vaccination, government restrictive policy, age differences*

### 1. INTRODUCTION

The COVID-19 outbreak during 2020 has drawn huge attention of the world, urging governments and health institutions to implement measures in order to slow down the spread of the virus and save lives [1]. According to the 38<sup>th</sup> WHO (World Health Organization) Regulatory Update on COVID-19, the confirmed cases of COVID-19 have passed over 220 million, with 4.5 million deaths. Referring to Lurie et al. [2], the development and improvement of vaccination is an expensive and lengthy process. Thus, general restrictions for self-protection are seemed to be very crucial and should be promoted to the population through information on mass social media, by governments and health institutions throughout the way in fighting the pandemic [3].

Upon this stage, how to deliver information efficiently and effectively becomes critically important. Framing effect, according to Kahneman and Tversky [4], is referring to the conception of acts, outcomes, as well as contingencies of the decision maker, associated with a specific choice. It is worth noting that the risk in this case is the central problem, as health behaviour frequently involve substantial amount of risks and uncertainty [5]. Thus, the framing effect in this case does not work alone, it triggers loss aversion consequently. Loss aversion refers to the bias that decision maker overweighs the

potential costs relative to the equivalent gain, which is the central and crucial element in decision making under risks [6]. Therefore, framing messages with emphasis on potential risks may lead decision makers to form their risk preferences due to loss aversion. Specific cases will be illustrated in each application.

In this paper, current studies will be shown in the literature review regarding the specific definition of framing effect, why it is important for this issue, and some relevant findings. Three applications of framing effect under COVID-19 will be introduced after literature review, concerning different focuses and interpretations of the framing effect. Ultimately, a conclusion will be drawn to sum up the idea that framing effect has essential impact on promoting self-protection and informing potential risks under the pandemic.

### 2. MAIN BODY

Framing effect matters in a great deal of public policies and decision making in times of COVID-19. With a focus on evaluating the effectiveness of gain and loss-framed messages, past and current studies reveal the nonnegligible importance of framing effect in different decision-making context such as vaccine promotion, government restrictive policy, and guidelines for a target age group.

## 2.1. Definition

The definition of framing effect, in general, is that the choices of agents are affected by the way which messages and problems are described [7]. Kahneman and Tversky [4] pointed out that the frame adopted by the decision maker, is partly controlled by how questions are formulated, and partly by the decision maker's personal habits, norms and other characteristics. These characteristics could be cultural variations [3], age differences [8], or decision makers' risk profile [1], etc. In the times of the pandemic, there are two ways to express health and economic behaviours: (1). Gain-framed messages (emphasizing the benefits of taking an action); (2). Loss-framed messages (emphasizing the costs of not taking an action) [9]. More specifically, gain-framed health messages were judged to be stronger than loss frame in adopting self-care behaviours, while loss-framed health messages are more effective to increase risk awareness [3].

The importance of framing effect under the pandemic can be shown from different perspectives. The increase in people's time spent on social media during crisis [10], as well as the fact that fast-paced and conflicting but highly demanded information [11] require message delivering to be highly efficient and effective. How the policies and public messages are framed is crucial for the effective communication between government and citizens to prevent the spread of COVID-19, through social networks and media, with limited space and time [3].

## 2.2. Review of Current Studies from Different Perspectives

What past and current studies have covered relative to how framing effect plays an important role during the pandemic, are vaccine or self-care promotion in a specific country or region [9][12][13], the influence of risk framing and prosocial value [14], susceptibility of younger and older adults to framing [8], and the effect of framing on policy preferences and emotions [11]. The focus of this paper is reviewing the loss vs. gain-framed messages, health vs. economic-framed messages, as well as framing effect on age differences.

### 2.2.1. Loss frame vs. gain frame

As pointed out by Olmastroni et al. [1], when it comes to fighting against COVID-19 and the resulted risks and losses, one-size-fits-all messages do not exist. From countries to households, from ethnicity to personal characteristics, people may have different responses and sensitivity to gain and loss-framed information. In the study of Lunn et al. [13], loss-framed posters emphasizing on "a person's behaviour may result in other vulnerable groups being infected" in promoting social distancing, was drawn the most caution by the

participants of their experiment in Ireland; In the meantime, the gain-framed messages are shown to be supportive in promoting prevention measures in the US and Netherlands [11]; While in the study of Sanders et al. [15] reveals no difference in respondents' preference between loss and gain-framed public health guidelines in the UK. Besides, Chmel et al. [14] categorized loss frame into "personal losses" and "losses for others", with an emphasis on positive effect in the "losses for others" frame from those with prosocial values and have more willingness to support restrictive policy, although generally there's no evidence that "losses for others" frame is more supportive than the other. One problem of this study is, the proportion of people who are of prosocial value, are very hard to measure in the population. If this is the case, the result that "people with prosocial values are more willing to support restrictive policy" is not seemed to be sufficient to suggest that it would be more effective if governments or other health institutions choose to emphasize on the "losses for others" frame.

### 2.2.2. Health frame vs. economic frame

Regarding the framing messages during the pandemic, current studies also have provided a comparative perspective of health-focus vs economic-focus messages.

In the research of Gantiva et al. [3], the impact of health and economic messages was constructed as "content message group" in their online-based experiment and was evaluated on participants' self-reported motivation to engage in self-care during the pandemic. The health focus messages were designed with an emphasis on number of death or risk of contagion (e.g., Following the self-care instructions, we could reduce the contagion risk by 50%); while the economic focus messages were highlighting the employment or taxes (e.g., By continuing with self-care today you will be able to keep your job tomorrow). The purpose of this is to test whether it is better to emphasizing on the risk of financial loss or personal health of individuals for promoting self-care during the pandemic, to pursue efficiency of message delivering. The result of the study shows that health messages turn out to be more effective than economic messages. Similar results are shown in the studies of Olmastroni et al. [1]. In their research, a controlled between-subjects experiment was conducted in Italy, and participants were asked to choose between either health or economic hypothetical programmes to deal with the health and economic effects on the spread of COVID-19 respectively. Under the health scenario, the statement was framed as "the new wave of COVID-19 infections was estimated to cause 30,000 deaths", which was focusing on lives of people. While in the economic scenario the statement was framed as "the new wave of infections was putting 600,000 jobs at risk", which was emphasizing on the risk of job losses.

Findings showed that the framing effect was stronger when it was revealed under lives than under job losses.

### 2.2.3. Framing effect on age differences

Current studies also suggest that framing effect could have different impact towards specific age groups, which makes further efficiency improvement in message delivering become possible. According to Davies et al. [16], with an increasing in age, the number of cases and risk of severe symptoms are shown to increase as well during the COVID-19 pandemic. Specifically, infection in individuals less than 20 years old is half that of adults over 20 years old and rises dramatically up to 69% of infections with older adults aged over 70 [16]. This suggests the susceptibility of the older age group that government and health institutions should care more about the vaccination rate and self-protection of this specific group during the pandemic. For the framing effects in age differences, Kim et al. [8] mentioned in their studies that older adults were shown to be sensitive to message framing than younger adults, and more likely to rely on heuristic processing. When the participants were asked to provide justification for their decisions, the two groups did not differ a lot. Hence, the older age group can be induced to apply a more systematic approach in decision making even though older adults may rely more on the heuristic processing, as suggested by the study.

So far, most studies are focusing on specific individual aspects of the issue separately, with quantitative evidence. There have been no studies to summarize the effect of framing on people's decision making with regards to several applications in the pandemic. Thus, 3 representative applications will be summarized in the following: (1). citizens' intention to be vaccinated; (2). how framing messages may support government restrictive policy; (3). guidelines for older adults over 65.

## 3. APPLICATIONS

### 3.1. Vaccination promotion under COVID-19

The first application of the framing effect in this paper, under the context of the COVID-19, is the promotion of vaccination. The main concern is how citizens evaluate the risk and uncertainty between a series of reactions after taking the vaccine and being infected. The results of whether loss frame or gain frame is more effective turn out to be ambiguous due to the nature of vaccination, but past studies have shown that no matter which frame works better, framing effect does have an impact on affecting people's decision on vaccination.

As mentioned, the two ways of framing to express health behaviours are through gain-framed messages and loss-framed messages. According to Kahneman and Tversky [4], even when two frames are describing an

equivalent situation, people can be sensitive and responsive to whether a behavioural choice is framed by its associate benefits (gain) or costs (loss). They also mentioned that people tend to avoid risks when options are framed in terms of associate benefit, but prefer to take the risks when the same options are presented in terms of associate costs. Back to the health issue, Rothman and Salovey [17] stated that almost all the information related to health can be constructed by either benefits or costs. In the context of promoting vaccination under the pandemic, the way to frame this promotion is mainly upon the costs of a person not to take a vaccine (e.g., If you refuse to be vaccinated, you are likely to be infected) or the benefits of taking a vaccine (e.g., If you are vaccinated, you will be well protected from COVID). On the one hand, it is worthy to be noticed that although both vaccination and general prevention (wearing a mask, maintaining social distance, etc.) are sharing the same trait as disease preventing behaviour, being vaccinated is an act with higher risk as it may cause a series of reactions [9]. According to Gantiva et al. [3], loss-frames are stronger than gain-frames in promoting high-risk behaviours.

However, on the other hand, Rothman and Salovey [17] introduced disease preventing and detecting behaviours in their studies. They defined disease preventing behaviour as behaviours that focus on avoiding the onset or further development of a health issue, and gain-framed messages are shown to be more effective in promoting this type of behaviours; while disease detecting behaviour, aiming at providing information about the absence or presence of an undesirable possible outcome of health, is more effectively promoted by loss-framed messages. Thus, it is seemed to be ambiguous to evaluate which frame is more effective, as vaccination is a high risk but disease-preventing behaviour.

The study done by Peng et al. [9] focusing on how framing effect may affect the public's intention of people in China to receive the COVID-19 vaccine, revealing that the loss-frame works better in promoting vaccination in China. Examples of loss and gain-framed simulation information are collected in their study by interviewing residents, consulting experts, and literature review. Variable measurement was conducted by survey method with scale values collected from the participants. Statistics shown in their studies reveals significant correlation between information framing (i.e., loss and gain-frame) and intention of being vaccinated, and hence framing effect is playing a role in influencing people's decision of receiving COVID-19 vaccine. More specifically, the results of linear regression analysis indicate that the impact of the loss frame is greater than the gain frame. In fact, there are other examples illustrating that the intention of receiving vaccines is impacted by the frame of information in general vaccination problems. For example, how messages are framed were also shown to be effective in promoting

HPV (human papillomavirus) vaccine [18] [19], H1N1 vaccine [20], and measles-mumps-rubella (MMR) vaccine [21].

### 3.2. Risk communication and restrictive government policy

The second application of framing effect in this paper is about how framing may help support government's restrictive policy under the pandemic. Studies upon whether gain-framed or loss-framed messages work better in promoting general self-care and restrictive behaviour (e.g., maintaining social distance, staying at home, etc.) are inconsistent due to cultural variations and some other characteristics such as the strength of the country's economy [3].

According to the information on the UK government official website, general restrictions include “getting tested frequently”, “wearing a face covering”, “staying at home and working from home”, “washing hands regularly”, and “maintaining social distance”, etc. The main trade off here is regarding whether people care more about the “losses for others” or “losses for themselves”, which is sacrificing part of their civil liberties for security in general [14]. Chmel et al. [14] also mentioned in their study that the willingness to sacrifice part of human rights depends on people's idea of risk perception. Hence, risk communication is crucial in the outbreak of health issues like the COVID-19 as the situation is under high uncertainty, especially for countries or regions which have no previous experience on tackling a widely spread and highly dangerous pandemic.

Similar as the case in vaccine promotion, framing effect plays a role in influencing people's decision under risk and uncertainty, and it was proved that people will behave differently when they evaluate choices in terms of associate benefits or costs [4]. Back to the discussion about supporting general government's restrictive policy, framing messages with an emphasis on risks using gain or loss frame may thus be effective in encouraging people to be more supportive towards general COVID-19 restrictions. Here's an example of the NHS (National Health Service) posters in the UK to motivate general self-care behaviours such as maintaining social distance, wearing a face covering, regularly washing your hands, and frequently getting tested:



**Figure 1** Self-care promotion posters from NHS official website: <https://coronavirusresources.phe.gov.uk/resources/posters/>

Both posters emphasize the potential risk of not taking certain actions. In this case, the health information is constructed in terms of costs, and is framed in loss. It is debatable that whether gain or loss frame is more effective under these circumstances, as loss frames are stronger than gain-framed messages in increasing risk awareness while gain frames are more effective in recommending self-care behaviours [3]. Cultural variations play a role upon the impact of framing effect [3], as suggested in the literature review.

### 3.3. Guidelines for older adults – age differences

The third application in this paper is regarding the COVID-19 guidelines for older adults, who are the most vulnerable group in the population that needs protection. According to Davies et al. [16], the severity of COVID-19 increases with age. Meanwhile, studies also show that older adults are more susceptible to the presentation of

messages [8]. Hence, framing effect is likely to be effective to inform older age groups about how to protect themselves from the disease.

Studies done by Kim et al. [8] show that older adults are more risk-averse than younger adults in terms of gain frame (e.g., how many people will live) and more risk-seeking in terms of loss frame (e.g., how many people will die), which reveals a pattern that older people are more sensitive to how messages are framed. In the meantime, they also found that short-term survival in loss frame and long-term survival in gain frame are more likely to draw the attention of older people. Centres for Disease Control and Prevention (CDC) provides several guidelines for older people over 65, emphasizing the vulnerability and risks of this specific age group, and loss-framed are mostly used to deliver these messages:

#### What Older Adults Need to Know about COVID-19 Vaccines

The risk of severe illness from COVID-19 increases with age. This is why CDC recommends that adults 65 years and older receive COVID-19 vaccines. Getting a COVID-19 vaccine is an important step to help prevent getting sick from COVID-19.

### COVID-19 Risks and Vaccine Information for Older Adults

Older unvaccinated adults are more likely to be hospitalized or die from COVID-19

**Figure 2** Guidelines for older adults from CDC official website: <https://www.cdc.gov/aging/covid19-guidance.html>

This is in line with the studies by Kim et al. that COVID-19 is a short-term survival issue for the older age group and is framed with focuses on risks and severe losses.

Besides, studies found that if asked to provide a rationale process of their decisions, the framing effect is significantly reduced for both younger adults and the old, which is showing a consistent choice pattern [8] [22]. However, it does not affect the effectiveness of framing upon these informative messages such as posters and public information in general. This is because the cognitive resources of older people are more limited comparing to younger adults, and the former is thus more likely to depend on heuristic information processing for this kind of tasks which demand less cognitive resources [23]. Public information such as posters are likely to be delivered in a fast speed, causing older people depend more on heuristic judgements. Hence, framing effect is likely to be able to affect older people's decision upon health issues such as how to protect themselves from COVID-19, with a focus on loss frame and the short-term risks for survival.

## 4. CONCLUSIONS

This paper illustrates the impact of framing effect under the context of COVID-19 pandemic, with respect

to its application in vaccine promotion, government restrictive policy, and specific guidelines for older adults. For the vaccine promotion, the vaccination itself is a high risk but disease-preventing behaviour, thus it seems ambiguous to define whether loss-frame or gain-frame is more effective upon this empirical level. Quantitative studies done by Peng et al found out that loss-framed message is more effective than gain-frame in China, however, the consequence may be different for other countries as variation on countries socioeconomic conditions and other potential characteristics exist. For promoting general government restrictive policy, risk communication is a crucial factor in affecting people's decision making under the high certainty circumstances such as COVID-19. Literature shows debatable results as loss-frame is stronger in increasing risk-awareness, while gain-frame is more effective in promoting self-care behaviours. For the impact of framing effect in age differences, more specifically, in the application of guidelines for older adults, studies show that older adults are more sensitive to the presentation of messages, and more risk-averse than the younger group. Literature reviews that short-term survival in loss frame and long-term survival in gain frame are more likely to draw the attention of older people. By summing up the examination of framing effect on people's decision making under the COVID-19 pandemic, these results may be used to deliver more effective information by the government and health institutions to inform the public and protect people from being infected. Ultimately, situations are changing rapidly, and current studies should only be a reference but a certain answer. Further research regarding the effectiveness of framing effect and what factors may influence the results of framing effect still require more investigations.

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