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The Influence of the Framing Effect Paradigm Upon Perspectives of Individuals on COVID-19 Vaccinations

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Abstract

The COVID-19 pandemic, and the encouragement of people to get vaccinated, has been received with mixed opinions. This study was conducted to assess if a positively framed passage, compared to a negatively framed passage, would increase one's perspective in support of COVID-19 vaccinations. This between-groups experimental design, in which one group received a positively framed passage and one received a negatively framed passage, was conducted online anonymously through Qualtrics. After reading the passage, participants answered a 17-item survey on a 5-point Likert-scale that was categorized into four subscales. The results of a series of independent samples *t*-tests showed a statistically significant difference for only the attitude subscale as the score of the positive frame condition was higher (M = 4.34) than the negative frame condition (M = 4.07). The higher score indicates a positive attitude towards COVID-19 vaccinations and the small effect size suggests a minor influence of the framing effect upon attitudes of post-secondary individuals in regard to COVID-19 vaccinations (r^2 = .07). However, no major differences were found for the remaining three subscales: reactance, emotions, and vaccination intentions.

Keywords: framing effect, reactance, emotion, attitude, vaccination intention, COVID-19 vaccination

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The Influence of the Framing Effect Paradigm Upon Perspectives of Individuals on COVID-19 Vaccinations

The ongoing global COVID-19 pandemic and the implementation of social distancing, masks and vaccine mandates have caused a significant partition in the perspectives of the general public. The differing opinions regarding such mandates can be collected, altered, and distributed across various networking platforms, especially in this time when technology and the internet are used extensively for work, academic, and personal purposes. British Columbia's government, along with the rest of Canada, has implemented protective measures such as prohibiting access to some services, businesses, and events without the presentation of a digital or physical copy of the vaccine card in place until 31 January 2022, though it could be extended, which has had many individuals questioning their perceived freedoms (Government of British Columbia, 2021).

Various elements such as social media exposure or mere curiosity to irrelevant secondary information can impact the perspectives of individuals. Vaccinations are not a novel topic; however, there are complex layers to this issue, including governing decisions of individuals' bodily autonomy and public health policies. According to psychological reactance theory, in such situations, individuals may experience an unpleasant motivational state encouraging them to re-establish their perceived autonomy, as their choices, actions, and freedoms are being constrained (Brehm, 1989). Reactance theory thus helps to explain the choices made by an individual which are not only due to their characteristics traits but are also influenced by external factors and social norms (Tversky & Kahneman, 1981). One such external factor can be the way in which messages are framed. For example, Tversky and Kahneman demonstrated the framing effect where individuals became biased towards one choice over another solely based on the framing of information presented to them (Gong et al., 2013).

Prior Research Regarding the Framing Effect and Vaccinations

The framing effect is a pervasive cognitive bias which occurs when our choices are influenced through the way they are framed and can include decisions about whether to get a vaccination or not. A positive frame emphasizes the benefits of an option (e.g., "By getting vaccinated, you will increase your chance of a healthy life without any restrictions caused by the novel coronavirus"); whereas, a negative frame emphasizes its detriments (e.g., "By not getting vaccinated, you significantly increase your risk of an infection and possible serious health consequences"; Reinhardt & Rossmann, 2021, p. 4). For example, Bigman and colleagues (2010)

found that participants who were presented with information about vaccine efficacy rather than vaccine inefficacy were more likely to rate vaccinations as more effective compared to when vaccine efficacy information was absent. In another study, Gesser-Edelsburg and colleagues (2015) found that a negative frame yielded stronger support for mandatory vaccine policies, whereas a positive frame produced stronger support for voluntary vaccine policies. Furthermore, in a study by Gerend and colleagues (2008), the authors manipulated both the framing of the health message in their study and the number of doses required against the human papillomavirus (HPV) infection. They predicted that when the vaccination would require only one dose, the participants would support the negative frame due to low-frequency prevention behaviour and negative connotation; whereas, when the vaccination process would require six doses (and numerous visits over time), the participants would support the positive frame due to repetitive prevention behaviour and positive connotation (Gerend et al., 2008). Gerend and colleagues (2008) found that participants reported greater intentions for vaccinations when exposed to the negative frame than the positive frame; and, the negative frame gained support by participants for a single dose immunization as opposed to multiple dose immunizations.

Recent Research Regarding the Framing Effect and the COVID-19 Vaccination

The influence of the framing effect was examined in relation to the COVID-19 vaccination as in one study it was found that the higher the understanding of health knowledge and literacy around COVID-19 information framing, the higher the intention to receive the COVID-19 vaccination (Peng et al., 2021). Another recent study explored the framing effect and vaccination attitudes regarding the importance of vaccination against COVID-19 of younger and older adults to create a target-specific approach in health communications (Reinhardt & Rossmann, 2021). Reinhardt and Rossmann's (2021) findings showed that a negative frame (e.g., "If you don't get vaccinated, you are making the immunization of the population more difficult—the currently valid restrictions will thus remain a major issue for a long time to come"; p. 4) lead the younger generations to more positive vaccination intentions, whereas neither a negative nor a positive frame about vaccination significantly influenced the older generations' vaccination intention. Additionally, Richards et al. (2021) discussed that the effect of a negative frame on psychological reactance should be more distinct from a positive frame when individuals believe in the inefficacy of a vaccination, whereas the effect of a negative or positive frame would make little difference when individuals believe in the efficacy of a vaccination. They found that

presenting low vaccine efficacy information to participants in the negative frame condition increased reactance and reduced intent for vaccination than those in the positive frame condition. In contrast, they found that presenting high or moderate vaccine efficacy information to participants in the negative frame condition decreased reactance and increased intent for vaccination (Richards et al., 2021).

Hypothesis of the Current Study

Overall, the research on the relationship between the framing effect and vaccinations demonstrates that there is increased psychological reactance and resultingly reduced influence from negative frames regarding vaccination opinions, beliefs, and intentions. Therefore, in our study about the framing effect and its influence on individuals' perspectives regarding COVID-19 vaccinations, we plan to replicate with minor adjustments for COVID-19 relevancy and randomly administer either a negative or a positive frame to assess for differences in individuals' perspectives based on the framed passages used in the Reinhardt and Rossmann's (2021) article. Thus, based on previous research by Bigman et al. (2010), Richards et al. (2021), and Reinhardt and Rossmann (2021), we expect that the effect of a positive frame on individuals' responses and perspectives of vaccine efficacy and public health policies would lead to reduced psychological reactance and increased intent for COVID-19 vaccinations. Accordingly, we hypothesized that a positively framed message, compared to a negatively framed message, would increase individuals' support specifically for COVID-19 vaccinations.

Methods

Participants

We recruited a total of 105 students from Kwantlen Polytechnic University (KPU) through the institution's psychology research pool. In the positively framed condition, the mean age was 23.13 years (SD = 7.14). This condition's year of study distribution included 16.13% in first year, 29.03% in second year, 32.26% in third year, 19.35% in fourth year, and 3.23% in fifth year or higher. In the negatively framed condition, the mean age of participants was 24.78 years (SD = 6.78). This condition's year of study distribution included 9.38% in first year, 34.38% in second year, 28.13% in third year, 21.88% in fourth year, and the remaining 6.25% in fifth year or higher. A total of 42 participants were excluded from the study on the basis that the survey was incomplete or the survey was completed in less than two minutes, leaving a final sample size of 63 participants. We did not encounter participants who partially completed the survey, all

respondents either completed the whole survey or did not fill it out at all; consequently, those who left the survey blank were excluded. The rationale behind the elimination of participants who completed the survey in less than two minutes was to exclude responses based upon possible carelessness as reading the framed passages and survey items was estimated to take a minimum of 20 minutes. The positively framed condition had 31 participants (4 males and 27 females), while the negatively framed condition consisted of 32 participants (7 males and 25 females). Within the positively framed condition, the racial or ethnic distribution was: 38.71% South Asian/Indian; 32.26% Caucasian/White; 16.13% Asian/Pacific Islander; 9.68% Multiracial/Biracial; and 3.26% selecting Other. Additionally, within the negatively framed condition, the racial or ethnic distribution was: 43.75% Caucasian/White; 28.13% South Asian/Indian; 15.63% Asian/Pacific Islander; 6.25% Hispanic/Latino; 3.13% for those identifying as Indigenous; and 3.13% for those selecting Multiracial/Biracial.

Measures

Demographic Items

Given the platform used for accessing the survey (i.e., KPU SONA system), the sample consisted only of students attending KPU who were enrolled on SONA. Participants were inquired about various demographic information such as their racial or ethnic background, age, year of study, as well as their gender identity. Racial or ethnic identities included on the survey were Caucasian/White, Asian/Pacific Islander, South Asian/Indian, Multiracial/biracial, Indigenous, and Other. The age demographic question was open-ended allowing participants to write their response to the question. The year of study ranged from first year to fifth year of study. Lastly, gender identities included on the survey were female, male, nonbinary, and the option of Other where participants could write their response.

Framed Passages

Participants were randomly assigned to one of two conditions: positive frame or negative frame. In each, they read a passage containing information about COVID-19 vaccinations and related policies with adjustments to the way the information was framed based on the condition (refer to appendix A). Each passage was approximately the same length (325 words) and had a similar set up with minor adjustments made to suit either condition in context relevant to COVID-19 based on positively or negatively framed texts from Reinhardt and Rossmann's (2021) article. The passages differed from one another in terms of either the personal and social benefits an

individual may receive when they decide to get vaccinated (e.g. “individuals who support vaccinations are significantly increasing the potential for a healthy life enjoying freedom outside restrictions caused by the novel coronavirus”) or the losses and harms that may occur to them if they chose not to get vaccinated (e.g. “the past couple years have demonstrated the consequences of an infection with COVID-19 which has resulted in 2,137 deaths total in British Columbia”).

Survey

The survey had 17 questions aimed to assess attitudes, beliefs, and opinions about the COVID-19 vaccine, as well as information pertaining to the health measures put into place by the health authorities of British Columbia (refer to appendix B). Responses were recorded using a 5-point Likert-scale format (where 1 represented strongly or totally disagree and 5 represented strongly or totally agree). The questions were divided into 4 subscales to assess participants’: (a) reactance, (b) emotions, (c) attitudes, and (d) vaccination intentions. This structure was based on a study conducted by Reinhardt and Rossmann (2012), where the survey content was created by merging items from different studies examining the same or similar topics. Minor alterations to any of the items included specifying that the statement or question was regarding COVID-19 or the COVID-19 vaccination replacing another virus’s label (i.e. human immunodeficiency virus [HIV]). There were 4 statements assessing reactance (e.g. “the message tried to pressure me”) obtained from studies conducted by Dillard and Shen (2005) and Askelson and colleagues (2010). A high score from these items would indicate high reactance to the content of the passages. Additionally, there were 2 statements assessing an individual’s emotions about the passage content (e.g. “after reading the passage I was worried”) attained from a study by Kim and colleagues (2020). A high score from these items indicates emotional discomfort. Furthermore, there were 8 statements assessing an individual’s attitudes towards COVID-19 and its vaccine (e.g. “vaccination against is necessary”) inspired by a measure used in studies from Askelson et al. (2010), Dillard and Shen (2005), and Graeber et al. (2021). A high score from these items would imply a general positive attitude or support towards the vaccine and its policies. Lastly, there were 3 questions assessing vaccination intention derived from the study by Kim and colleagues (2020). A high score from these items reflects higher intention to get vaccinated against COVID-19.

Procedures

All data were collected anonymously online via Qualtrics (www.qualtrics.com) and the survey was available from 14 November 2021 until 23 November 2021. After obtaining electronic consent, participants were randomly assigned to one of the two experimental groups (positive or negative frame) using the Qualtrics randomizer function. Participants were asked to respond to 4 demographic questions which enabled them to proceed to read one of the framed messages about COVID-19 and to respond to the survey items. After completion of the survey, participants were presented with a debriefing statement and were granted 0.5% bonus credit.

Results

Independent samples *t*-tests were conducted using the Statistical Package for the Social Sciences (SPSS) software program to compare the scores of the four subscales (reactance, emotions, attitudes, and vaccination intentions) between the positive and negative frame conditions. Prior to running the analysis, the equal variance assumption was assessed using Levene's test. As this assumption was violated for the attitude subscale, we used a Welch correction to account for this violation. There were no statistically significant differences in the remaining subscales; reactance, emotions, and vaccine intentions (Table 1). The attitude subscale is the only one that yielded a statistically significant difference between the positive and negative frames, as the score of the positive frame condition was significantly higher ($M = 4.34$) than the negative frame condition ($M = 4.07$). The higher score indicates a more positive attitude towards COVID-19 vaccines. Additionally, the percentage of variance in the attitude subscale was computed to be a small effect size which suggests that the framing effect only had a minor influence on the attitude of young post-secondary adults in regard to the COVID-19 vaccine ($r^2 = .07$). Hence, the results from the subscales on reactance, emotions, and vaccination intentions were inconsistent with our predictions; therefore, our hypothesis was not fully supported.

Discussion

Our study assessed whether a positively or negatively framed passage would influence an individual's perspective on the COVID-19 vaccination; we hypothesized that the positively framed condition would increase support for vaccination. We did not find any differences between the two conditions for the subscales assessing reactance, emotion, or vaccination intentions; however, we did find that the two conditions differed from one another on attitudes towards COVID-19 and its vaccinations. This may suggest that the framing effect has the ability

to change the attitudes of young adults in regard to the COVID-19 vaccine. Findings pertaining to participants' reactance, emotions, and vaccine intentions contrast with past research on this topic, particularly those situated in the context of health care. Bigman and colleagues (2010) noted that previous studies examining the framing effect in healthcare found that the way information is presented does impact an individual's preferences and behaviours. An additional study suggested that there may be a difference between which type of framed message is more effective within specific age groups and found that young adults exposed to a negatively framed message tend to elicit a stronger intention and more positive attitude towards vaccinations (Reinhardt & Rossman, 2021). This outcome completely contrasts with our findings since the positively framed condition increased an attitude towards COVID-19 vaccinations as we obtained a significant difference between the conditions on the attitude's subscale, but not on the intention's subscale, despite our sample also consisting of young adults. One possible explanation for absence of major difference for reactance, emotions, and vaccination intentions could be primary health knowledge and literacy levels of the participants who completed our questionnaire (Peng et al., 2021). All of our participants were studying at KPU and were thus likely to acknowledge the importance of vaccination information and research. Moreover, all participants were able to fill out and submit our questionnaire due to technological availability and access to the internet. This is an indication that all participants had the resources to be notified of or to search about COVID-19 and its vaccination information. Therefore, most, if not all, participants were notified or knew about the efficacy of the COVID-19 vaccination, which may be why we did not derive significant differences between the positive and negative frame conditions (Richards et al., 2021). There is also the possibility of fatigue due to the daily cues (i.e., mask reminder posters, hand sanitizer stations, etc.) and exposure to COVID-19 data and relevant sources which may have resulted in low levels of reactance overall. Lastly, in our study a reason for the small effect on vaccination intentions may be that the majority of the participants may already have been vaccinated (based on the percentage of individuals vaccinated in British Columbia) in order to attend the post-secondary institution (Government of British Columbia, 2021).

Limitations

One of the limitations of this study was the small sample size since having the opportunity to obtain a larger sample of participants, including responses from middle-aged adults and seniors

outside of post-secondary institutions could have elicited significant differences between the results of the positive and negative frame conditions. Moreover, the structure of this study was a limitation that leads to low generalizability to the rest of the population outside of KPU since all the participants in this study were KPU students. Finally, there was a limitation due to the possibility that an extraneous variable—confirmation bias (which is the tendency to interpret information consistent with an individual's existing beliefs), significantly influenced the responses of the participants, as many of them may have been notified or personally researched about COVID-19 and its vaccine information and have already been vaccinated to attend KPU. However, this was personal health information we were unauthorized to ask about since questioning the participants' vaccination status would ensue ethical concerns.

Implications & Applications

Further implications or applications of our study can be used to influence or change the attitudes and perspectives of younger generations by using the framing effect since the majority of the participants consisted of post-secondary adults. There was an insignificant difference between the positively or negatively framed conditions on several of the subscales; therefore, the framing effect can be less effective at certain times possibly due to external circumstances (i.e. social media exposure) or confirmation bias (i.e. reinforcing existing beliefs about COVID-19 and its vaccine information). Additionally, some of the findings from our study imply that using a positively framed message can increase a positive attitude towards the COVID-19 vaccination and similar results may be obtained in regard to other vaccinations. Moreover, the current findings may have applications for attitude change around other areas, either through positive frames (e.g., encouraging youth to join sports, proposing post-secondary students to partake in mental health or wellness programs without guilt, etc.) or negative ones (e.g., preventing the youth from gang or drug-related activities or cautioning the general public about health risks when it comes to smoking or drinking, etc.), with positive frames being more effective.

Tables

Table 1

Means, Standard Deviations and t-Test Results for the Four Subscale Dependent Variables

	NF		PF					
Variable	*M*	*SD*	*M*	*SD*	*df*	*t*	*p*	r^2
Reactance	2.63	0.66	2.53	0.76	61	0.56	.500	.01
Emotions	2.30	1.04	1.92	1.15	61	1.37	.577	.03
Attitudes	4.07	0.60	4.34	0.43	56.38	-2.09	.040*	.07
Vaccination Intentions	4.57	0.95	4.70	0.62	61	-0.68	.230	.01

Note. NF= Negative Frame. PF= Positive Frame.
*p < .05.

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Appendix A

Framed Passage Stimulus

Positive Frame

The decision in support of the COVID-19 vaccination proposes various advantages for the global population and the community including your family, friends, and yourself. The past couple years have demonstrated the consequences of an infection with COVID-19 which has resulted in 3,853,187 individuals fully vaccinated with a COVID-19 vaccine in British Columbia. Individuals who support vaccinations are significantly increasing the potential for a healthy life enjoying freedom outside restrictions caused by the novel coronavirus. Therefore, it's all up to those individuals to encourage others to support vaccinations to increase the probability to create a world filled with positivity and wellness when it comes to those they are acquainted with and themselves!

In order to prevent the uncontrollable transmission of the novel coronavirus, British Columbians have had to drastically alter their behaviour (e.g., compulsory mask wearing in public places and continuous social distancing). Hence, those individuals who are vaccinated are contributing to the immunization of the population efficiently—the current provincial and regional restrictions under the Public Health Act will finally come to an end. For example, individuals who are 12 and older will have extended access to both indoor and outdoor personal gatherings at private residences and vacation accommodations and leisure activities (e.g., events like sports, theatres, festivals, fitness and recreation centres). Since COVID-19 is a public health emergency under the Public Health Act, vaccinated individuals can be carefree without worrying about orders that can be enforced by police or other enforcement officials or that can even result in leading to fines between $230 to $2,300 of violation tickets of unsafe COVID-19 behaviour.

Lastly, with the decision in support of the COVID-19 vaccination, the individual is not only protecting themselves but the rest of the community including children and seniors. If the majority get vaccinated against SARS-CoV-2, then the health of those who cannot get vaccinated (e.g., due to allergies to the ingredients of the vaccine) is also protected. Thus, this important decision is actively contributing to herd immunity.

Negative Frame

The decision against the COVID-19 vaccination proposes various disadvantages for the global population and the community including your family, friends, and yourself. The past couple years have demonstrated the consequences of an infection with COVID-19 which has resulted in 2,137 deaths total in British Columbia. Individuals who oppose vaccinations are significantly increasing the risk of an infection and possible serious health repercussions. Therefore, it's all up to those individuals to rethink that choice to not increase the probability to deal with lethal health consequences when it comes to those they are acquainted with and themselves!

In order to prevent the uncontrollable transmission of the novel coronavirus, British Columbians have had to drastically alter their behaviour (e.g., compulsory mask wearing in public places and continuous social distancing). Hence, those individuals who are not yet vaccinated are causing immunization for the population to be more difficult—the current provincial and regional restrictions under the Public Health Act will persist as a major issue for a long period of time. For example, individuals who are 12 and older will be limited on both indoor and outdoor personal gatherings at private residences and vacation accommodations or restrictions on leisure activities (e.g., events like sports, theatres, festivals, fitness and recreation centres) will remain highly probable. Since COVID-19 is a public health emergency under the Public Health Act, these orders must be followed as some orders can be enforced by police or other enforcement officials or can even result in fines between $230 to $2,300 of violation tickets for unsafe COVID-19 behaviour.

Lastly, with the decision against the COVID-19 vaccination, the individual is not only endangering themselves but the rest of the community including children and seniors. If the majority of the population does not get vaccinated against SARS-CoV-2, then the health of those who are not able to become immunized (e.g., due to allergies to the ingredients of the vaccine) will also be at risk. Thus, this important decision is actively impeding herd immunity.

Note. Negative and positive framed passages derived from "Table 2: Stimulus Manipulation" of the *Age-Related Framing Effects: Why Vaccination Against COVID-19 Should Be Promoted Differently in Younger and Older Adults* article (Reinhardt & Rossmann, 2021).

Appendix B

Online Questionnaire Items

1. The message tried to pressure me.
2. I become frustrated when I'm unable to make free and independent decisions.
3. The message threatened my freedom to choose.
4. Advice and recommendations usually include me to do just the opposite.
5. After reading the passage I felt troubled.
6. After reading the passage I felt worried.
7. Vaccination against COVID-19 is beneficial.
8. Vaccination against COVID-19 is necessary.
9. Vaccination against COVID-19 is a good idea.
10. Vaccination against COVID-19 is wise.
11. Most people overestimate the dangerousness of the virus.
12. Vaccine mandates are permissible due to the dangers of the virus.
13. Vaccine mandates are needed to get enough people vaccinated.
14. Getting vaccinated lowers the risk of contracting COVID-19.
15. After reading the passage, how likely would you be to get the COVID-19 vaccine?
16. After reading the passage, how likely would you be to get the vaccine in the future?
17. After reading the passage, if you were faced with the decision of whether to get the vaccine today, how likely is it that you would choose to get the vaccine?

Note. Online questionnaire items for the survey were derived from various empirical research articles including Askelson et al. (2010), Dillard & Shen (2005), Graeber et al. (2021), and Kim et al. (2020).