

**Conservatism, Conspiracy Mentality, and Social Media as Factors Related to Attitudes**

**Towards Face Masks and Vaccines**

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## Abstract

The present study sought to identify factors that influence attitudes towards commonly recommended public health measures, such as face masks and vaccines. Specifically, conservatism, conspiracy mentality, media literacy, and social media use were investigated as they relate to attitudes and behaviors towards face masks and vaccines in a rural Canadian setting. Participants were recruited from Brandon University introductory psychology classes and completed several previously established self-report measures of the variables of interest. The results found conspiracy mentality and economic conservatism to be significant predictors of face mask perceptions and vaccine attitudes. Media literacy and social media use were not consistently found to be significant predictors of face mask perceptions and vaccine attitudes or behaviors. These findings have implications for how public policy should approach addressing concerns over COVID-19 public health precautions. More efforts are needed to combat the spread of conspiracy theories and address the economic concerns of the public.

*Keywords:* COVID-19, public health compliance, face mask perceptions, vaccine attitudes, economic conservatism, social conservatism, conspiracy mentality, media literacy, social media use

## **Conservatism, Conspiracy Mentality, and Social Media as Factors Related to Attitudes Towards Face Masks and Vaccines**

The currently ongoing Coronavirus pandemic, which was announced as a global pandemic by the world health organization on March 11, 2020 (WHO, 2020), has brought a variety of changes to our daily lives. Many governments have implemented regulations and other recommendations to help limit the spread of the virus. Discussions of COVID-19 are virtually impossible to ignore, with most major news stations speaking about the virus, recent infections, and death rates, as well as the various opinions on the current responses in many countries around the world. Further, the rapid availability of information due to social media, allows us to be constantly reminded of the current situation. The current study seeks to analyze factors related to public health compliance – a topic of great public debate in the previous 2 years, as they relate to attitudes and behaviors towards face masks and vaccines, arguably two of the most important methods of helping to slow the spread of the virus. Specifically, this study looks at conservatism, conspiracy mentality, media literacy and social media use as predictors of face mask and vaccine attitudes and behaviors.

### **COVID-19 Compliance**

Compliance with government regulations and recommendations has been of interest for many of the pandemics during the 21<sup>st</sup> century including SARS, H1N1, and COVID-19. Behaviors that have been recommended during these pandemics have included social distancing, frequent hand washing, receiving vaccinations, and wearing face masks. Seeking to provide baseline compliance data for future pandemic research, Taylor et al. (2009) collected surveys on participants' willingness to comply with health measures, receive vaccinations, and wear a face mask during a hypothetical influenza pandemic. Respondents were very likely to comply with

health measures and receive vaccinations, while just over half were willing to wear a face mask. In a study prior to mandatory face mask regulations during the COVID-19 pandemic, Rieger (2020) examined people's perceptions of face masks and factors influencing their willingness to wear them. While the majority of respondents would be willing to wear face masks if made mandatory or as COVID-19 cases increased, there was still a rather large minority (20%) who would refuse to wear face masks in the streets, even if required by law. Across various scenarios, participant's willingness to wear a face mask increased when there were greater perceptions of infection risk (Rieger, 2020). During the H1N1 pandemic, greater perceptions of risk were associated with increased use of face masks (Cowling et al., 2010). These studies demonstrate the importance of health compliance research during pandemics, which may be influenced by a variety of individual, contextual, and temporal factors.

As the pandemic has continued for nearly two years, it is expected that compliance may be lower now than initially at the start of the pandemic. Cowling et al. (2010) notes that public health precautions do experience a slight decline over time. Perceptions may have altered as well. Young individuals were particularly concerned about appearances, how they might be negatively judged or perceived for wearing face masks (Rieger, 2020), while women reported face masks to be very uncomfortable and men believed they infringed upon their independence (Howard, 2021). It is thus important to continue to study attitudes and behaviors related to COVID-19 compliance throughout the course of the pandemic.

### **Conservatism**

Throughout the COVID-19 pandemic, political divides have been at the forefront of conversations when it comes to opinions on government policy for mandatory health regulations. Many factors, including political orientation, affect our behaviors and shape our thinking.

Modern theories of disease in the U.S. suggests that health outcomes derive from behaviors and lifestyle choices (Kannan & Veazie, 2018). Rules such as mandatory public face mask usage, vaccine mandates, social distancing, and capacity limitations have been met with protest for infringement of civil liberties and the belief in political conspiracies (Kemmelmeier & Jami, 2021). Fueling the divide between the left and the right have been the 2020 U.S. and 2021 Canadian federal elections, taking place during a time of unrest and low levels of trust in government, which have sparked protests in both countries.

Unidimensional models of political orientation place conservatism and liberalism at opposite poles of the political spectrum. Conservatism reflects how traditional one is in their beliefs. The majority of research conducted on conservatism has taken place in the U.S. where political divisions are stark in comparison to Canada. Conservatism has further been shown to be associated with a greater sensitivity to threats and avoidance of threats, particularly pathogen threat while liberal individuals tend to be less pathogen threat avoidant (Samore et al., 2021). The behavioral immune system (BIS) typically elicits disgust in response to stimuli, which may pose a disease threat, leading to a behavioral response such as avoidance to mitigate the spread (Kempthorne & Terrizzi, 2021). The BIS is believed to be an evolutionary adaptation to the challenges associated with infectious disease and has been consistently associated with socially conservative attitudes (Kempthorne & Terrizzi, 2021). However, those high in disgust-sensitivity tend to have more negative attitudes about vaccines (Kempthorne & Terrizzi, 2021). Wearing a face mask or receiving the COVID-19 vaccination is considered a passive health behavior, or an avoidance-oriented behavior aimed at preventing contraction of the disease (Howard, 2021). Therefore, engaging in these behaviors would be in-line with avoiding threatening pathogens.

However, in studying both political orientation and political environment on health behaviors, conservatives were more likely to engage in unhealthy behaviors in comparison with liberals such as poor eating, not exercising, and not receiving their yearly flu vaccinations (Kannan & Veazie, 2018). Many studies on compliance with COVID-19 public health guidelines have also demonstrated that conservatives and conservative areas have been less compliant with public health measures (Barbieri & Bonini, 2021; Samore et al., 2021). Further, conservatives also report more negative views of face masks and increased willingness to reduce face mask usage in the future in comparison with liberals (Kemmelmeier & Jami, 2021). Lastly, conservatism is negatively correlated with disease-avoidant measures such as holding negative attitudes about vaccines, low knowledge of COVID-19, and low COVID-19 anxiety (Kempthorne & Terrizzi, 2021). These findings suggest that conservatism is not a disease avoidance strategy (Kempthorne & Terrizzi, 2021) and appears to be driven by lower trust in science and liberal sources of information as conservative media has downplayed the severity of the pandemic, criticizing the government response as disproportional (Kemmelmeier & Jami, 2021). It should be noted that other studies have found conservatives to hold more favorable opinions of the U.S. government's response despite leading the world in total number of infections and deaths during the study (Kempthorne & Terrizzi, 2021) and continuing to do so at the time of writing this research paper (WHO, n.d.). The threat conservatives may thus be keener to avoid is the threat to their independence and freedom of choice (Samore et al., 2021).

### **Conspiracy Mentality**

In the age of fast spreading and easily accessible information, opinions, even those largely unfounded and unrealistic are common to come by. Conspiracy theories are easily spread through media and word of mouth. While there are many conspiracy theories that are decidedly

political, there are also non-partisan theories. Belief in conspiracy theories is common, with a representative sample of US citizens revealing nearly 85% believed in at least one COVID-19 conspiracy theory (Agle & Xiao, 2021). Further, endorsement of conspiracy theories tends to be higher during times of crisis, such as during a global pandemic likely due to heuristic thinking that, big events must have big causes (Agle & Xiao, 2021). Popular conspiracy theories have included the assassination of JFK, the death of Princess Diana, and the moon landing. The current pandemic has been no exception with many conspiracy theories having been brought to the public throughout the past 2 years, such as the belief that the virus is a hoax, or that the virus was created in a Chinese lab and released to the world (Douglas, 2021).

Conspiracy mentality is the general susceptibility to explanations based on conspiracy theories (Bruder et al., 2013). Individuals with a high conspiracy mentality seek to challenge normative behaviors supported by high power groups (Marinthe et al., 2020), such as governments, which are perceived as threatening and want to challenge the status quo by speaking and acting against the beliefs of those groups (Imhoff & Bruder, 2014).

While belief in conspiracy theories influence behaviors, mere exposure to conspiracy theories can also affect behavioral intentions as demonstrated in a study using a fictitious virus looking at vaccine hesitancy. This study found that individuals exposed to misinformation about the fictitious vaccine reported greater fear, lower trust, and lower intentions to vaccinate than those in an anti-conspiracy condition or control condition (Jolley & Douglas, 2014). Much like conservatives, who show low levels of trust in science (Samore et al., 2021), belief in vaccine conspiracy theories is also associated with low levels of trust in science, offering an attempt at explaining away copious amounts of scientific research indicating that vaccines are safe and effective (Jolley & Douglas, 2014). Indeed, during the current pandemic, belief in conspiracy

theories is positively correlated with COVID-19 vaccine hesitancy (Allington et al., 2021; Nazli et al., 2022).

### **Social Media Use and Literacy**

Social media plays an integral role in our daily lives and is a popular method of communication for many, especially for those of younger generations. Media literacy refers to one's knowledge and motivations to engage with news information (Maksl et al., 2015). Media literacy plays an important part in assessing the information found online and through traditional media outlets such as the news. Those high in news media literacy are more intrinsically motivated to consume media, more skeptical, and more knowledgeable about current events (Maksl et al., 2015).

Many people use social media to search for information pertaining to their health and the majority believe that information to be accurate (Sumayyia et al., 2019). Research by Paek et al. (2013) shows that increased interaction with a social media campaign can affect offline behaviors, including health behaviors. People are likely to follow the health advice they find online, and increased media use for health information is related to increasing one's literacy and thus their self-efficacy, confidence, and intentions to follow health advice to take care of themselves (Niu et al., 2021). During the current pandemic, increased media usage has increased behaviors aimed at preventing COVID-19 (Riza & Tanti, 2020). Individuals who use social media for COVID-19 health information may have more access to up-to-date knowledge and recommendations aimed at avoiding risks, which could improve their anxiety and increase motivation to cope with uncertainties (Niu et al., 2021). However, high informational reliance on social media is also related to vaccine hesitancy (Allington et al., 2021), thus, it could be presumed that misinformation found on social media may also be taken at face value, especially



for those with lower news media literacy. As conspiracy theories are prevalent on social media, one may come across misinformation pertaining to COVID-19 precautions, such as face masks and vaccines. In their study on vaccine intentions and conspiracy theories, Jolley and Douglas (2014) found that exposure to vaccine conspiracies was associated with lower intentions to vaccinate. Current research throughout the COVID-19 pandemic also speculates that increased exposure to misleading information found on social media is associated with vaccine hesitancy (Allington et al., 2021; Nazli et al., 2022).

### **Rationale**

The COVID-19 pandemic has changed daily living with mandatory face mask regulations appearing on a global level. In our current political climate, debates over the requirements of face masks and vaccine mandates have been prevalent. Numerous political protests have occurred over the past year in response to federal elections in North America and anti-mask and vaccine rallies occurred in Manitoba during the spring of 2021, taking place in Winnipeg, Winkler, and Steinbach (Stones, 2021).

Social media has proven to be an effective tool for providing information about the pandemic and as a platform for debate and expression of opinions on the restrictions. Conservative and liberal media often take opposing stances in coverage and discussions of face mask and vaccine mandates. Previous studies have observed a decreased perception of risk during the COVID-19 pandemic in conservative media (Samore et al., 2021). Conservative political orientation has been widely studied in relation to health behaviors, often theorized to be more pathogen-threat avoidant, however this has not been seen during the current pandemic, as conservatives have shown lower rates of compliance with public health measures (Samore et al., 2021). Contradictory impacts of social media have been found in previous literature. Social

media use increased literacy when used for health information (Niu et al., 2021), however, informational reliance on social media is related to increased vaccine hesitancy (Allington et al., 2021; Nazli et al., 2022).

Conspiracy theories have also surrounded COVID-19, having been widespread due to the rapid and global sharing nature of social media. Facebook and other social media platforms have introduced COVID-19 content warnings on all posts related to the pandemic and vaccinations with direct links to government websites for accurate information. Given that exposure to media campaigns can affect offline behaviors, it is important to consider how social media and conspiratorial thinking is related to attitudes and behaviors associated with the two important means of protection encouraged for the COVID-19 pandemic: face masks and vaccines.

Many studies have been conducted throughout the COVID-19 pandemic and previous epidemics to understand the factors related to hesitancy and compliance with government health mandates. However, thus far these studies have not been conducted in a rural Canadian setting. To the best of my knowledge, this study is the first to investigate the factors of conservatism, conspiracy mentality, media literacy and social media use in relation to vaccine and face mask perceptions and behaviors. Moreover, the small city of Brandon, which is the epicenter of Western Manitoba or 'Westman' attracts university students from across the province and is predominantly conservative leaning, having nearly consistently elected a conservative MP since 1953 ("Brandon—Souris", 2021). The unique demographic and political makeup of the area should yield interesting results in this analysis in comparison with research conducted in the U.S, as university students are primarily liberal although the geographic area is not.

## **Hypotheses**

Based on findings from previous studies conducted primarily in the U.S., it is predicted that conservatism and conspiracy mentality will have a negative relationship with favorable perceptions of face masks and attitudes towards vaccines, while social media literacy and social media use will have a positive relationship with favorable perceptions of face masks and attitudes towards vaccines. Further, it is believed that conservatism will be the strongest predictor on face mask and vaccine attitudes due to consistent findings of lower compliance rates amongst conservative individuals, while social media use will be the weakest predictor. While increased social media use may increase media literacy and knowledge about the benefits of compliance, it may also increase exposure to misinformation instilling fear and mistrust in necessary public health precautions.

## **Methods**

### **Participants**

Participants were recruited from a convenience sample of Brandon University's Introduction to Psychology classes with the permission of the instructors at the beginning of the Winter 2022 semester. As a mandatory liberal education requirement, these students represented a diverse range of academic majors at the university. The participants were given a 1% bonus credit in their classes as an incentive. Enrollment in an Introduction to Psychology class was required to obtain the participation incentive and no other inclusion criteria were included. An a-priori power analysis was conducted to estimate sample size. Assuming a small-to-medium effect size of  $f^2=0.13$  to be conservative, with six predictors, 115 participants would be needed to obtain a desired power of 0.8.

One hundred and eight participants were recruited representing a variety of academic faculties, Manitoba political voting ridings, and economic backgrounds. Seventy-five percent of the sample identified as female, 22.22% as male, and 2.78% as non-binary or other. The average age of participants was 21.41 years old, ranging from age 17 to 58 years old with the majority of participants being 18 years old (32%).

## **Materials**

Participants were instructed to complete a survey consisting of the following five scales. All the scales have been psychometrically validated and used in previous research.

The Social and Economic Conservatism Scale (SECS) (Everett, 2013) is a 12-item measure used to assess conservatism. The scale assesses conservative attitudes towards contemporary social and economic issues such as abortion, gun ownership, and business. Participants indicate the extent to which they feel positively or negatively about each issue on a scale of 0 (negative) to 100 (positive) with 50 being neutral. Higher scores indicate greater conservatism. Scores were initially compared against several other verified measures of conservatism/liberalism and conservative mindset (e.g., Right-wing authoritarianism, Social-dominance orientation) demonstrating good overall internal reliability ( $\alpha = 0.88$ ).

The Conspiracy Mentality Questionnaire (CMQ) (Bruder et al., 2013) uses five items to assess conspiracy mentality, worded in a generalized fashion. Participants were asked to indicate the percentage to which they believe statements such as “I think that many very important things happen in the world, which the public is never informed about” to be true from 0% (certainly not) to 100% (certain). Those with higher scores are more susceptible to belief in conspiracy theories. The scale shows good internal consistency ( $\alpha = 0.84$ ) and demonstrated a high correlation with another measure of generic conspiracy belief.

Social media literacy was assessed using two of the three subscales from the News Media Literacy Questionnaire (Maksl et al., 2015). The first involves Automatic versus Mindful thought processing, which reflects the degree to which participants engage in mindful and skeptical thought processing while interacting with news media. Items on this subscale were adapted from the Need for Cognition scale (Epstein et al., 1996 as cited in Maksl et al., 2015) ( $\alpha = 0.78$ ). Higher scores indicate more motivation to consume media, enjoyment of thinking, and greater need for cognition. The second involves Locus of Media Control, which is the degree to which participants believe they are in control of media influences and was adapted from a previous scale measuring feelings of control over one's own health (Wallston & Studler Wallston, 1978 as cited in Maksl et al., 2015) ( $\alpha = 0.635$ ). Higher scores indicate a more intrinsic media locus of control, meaning that they believe they are in control of their own beliefs and thoughts, not influenced by the media. Together, participants received 11 items and indicated the extent to which they agreed or disagreed with statements such as "If I pay attention to different sources of news, I can avoid being misinformed" on a scale of 1 (strongly agree) to 5 (strongly disagree). The third subscale used in the original study News Media Knowledge Structures, was omitted due to its heavy reliance on facts about American journalism accreditation and news, which is not relevant to a Canadian population.

Social media use was measured using a scale of 1 (never) to 4 (several times a day) for the question "How much do you use each of the following social media platforms for news information?". This question not only provides an idea as to how frequently social media is used for news information, but also which specific platform is most commonly used. The following platforms were used: Twitter, Facebook, Instagram, YouTube, Snapchat, TikTok, and WhatsApp.

The Face Mask Perception Scale (FMPS) (Howard, 2020) uses 32 items to assess one's general attitude about face masks consisting of eight subscales: Comfort, Efficacy doubts, Access, Compensation, Inconvenience, Appearance, and Independence. Participants indicated the degree to which they agree or disagree from 1 (strongly disagree) to 7 (strongly agree) with statements such as "When I do not wear a face mask in public, it is because I do not like blindly following suggestions." Higher scores indicate more negative perceptions of face masks. The factor structure of the FMPS was confirmed using a confirmatory factor analysis. Each item strongly loaded onto its respective latent factor ( $>0.48$ ; Howard, 2020).

To measure vaccine attitudes, the Vaccine Attitudes Examination (VAX) Scale (Martin & Petrie, 2017) was used, which assesses mistrust of vaccine benefits, worries about unforeseen future effects, concerns about commercial profiteering, and preference for natural immunity through 12 statements about general vaccines such as "Although most vaccines appear to be safe, there may be problems that we have not yet discovered." Participants answered on a scale to indicate the degree to which they agree or disagree from 1 (strongly agree) to 6 (strongly disagree) with higher scores indicating more positive attitudes towards vaccines. This scale demonstrated high consistency over time. Convergent validity was evaluated by correlating the VAX scale with the Parent Attitudes about Childhood Vaccines (PACV) safety efficacy subscale, which correlated well ( $r(90) = .42, p < .001$ ; Martin & Petrie, 2017). Further, scores were compared to additional behavioral and attitudinal measures, such as having received an Influenza vaccine in the past year as well as intentions to vaccinate in the upcoming year, and found that those with less favorable attitudes of vaccines were less likely to have been vaccinated or intend to be vaccinated (Martin & Petrie, 2017).

Basic demographic information including age, faculty, gender identity, household income, and electoral district of primary residence was asked at the beginning of the survey. Participants were further asked about their behaviors in relation to their attitudes about face masks and vaccines. For vaccine behaviors, participants provided an estimate of the date of their inoculations by selecting the month of 2021 during which they received their first vaccine. This information was then cross-referenced with their age to determine how long participants waited before deciding on receiving the vaccine. Longer wait times indicated more hesitancy about vaccines, possibly the reluctance to receive vaccination.

Measuring participants face mask behaviors was also difficult and could not be assessed directly. Due to provincial restrictions in Manitoba requiring the use of face masks in all public spaces and the requirements of Brandon University for face mask use in all buildings regardless of provincial regulations, face mask behaviors were assessed using the hypothetical question “If face mask restrictions were lifted tomorrow, how likely would you be to wear a face mask in public?”. This question was answered on a scale of 1 (not at all likely) to 3 (very likely). Thus, face mask behaviors reflected hypothetical behavioral intentions.

## **Procedure**

After recruiting participants from Introduction to Psychology classes, data collection was carried out online through Microsoft Forms using BU’s secure Microsoft Office Portal. Participants were provided a link to complete the informed consent form, which required that they type their name, allowing their participation to be recorded for the purpose of obtaining the incentive of a 1% bonus mark in their classes. The consent form featured a link for those who provided consent to click and be redirected to the survey, which remained anonymous. The survey contained the several mentioned scales and included the additional questions on their

behaviors. Participants first reported their demographic information. Then they were assessed on level of conservatism using the Social and Economic Conservatism Scale (Everett, 2013), susceptibility to belief in conspiracy theories using the Conspiracy Mentality Questionnaire (Bruder et al., 2013), and literacy of media news using items from the News Media Literacy Questionnaire (Maksl et al., 2015). In addition, they were asked a question on their social media use. Participants were then assessed on their perceptions regarding face masks using the Face Mask Perception Scale (Howard, 2020) and vaccines using the Vaccine Attitudes Examination Scale (Martin & Petrie, 2017). Lastly, participants answered one question about their intended face mask behaviors in a hypothetical situation and provided an estimate of when they were first vaccinated. Participants were free to withdraw at any time while taking the questionnaire or not provide responses to questions that caused them discomfort.

## **Results**

Multiple standard multiple regression analyses were performed to predict the average score on the FMPS (Howard, 2020), the VAX scale (Martin & Petrie, 2017), and the distance in months from when participants became eligible to when they received their first COVID-19 vaccine (on a scale from -4 to 8) of 108 responses from six predictors: social conservatism, economic conservatism, conspiracy mentality, automatic versus mindful thought processing, locus of media control, and social media use per day.

Visual inspections of the histogram of residuals and scatterplots of standardized residuals revealed that the assumptions of normality, linearity and homoscedasticity were satisfied for all analyses. Based on the standardized residuals and Malanohabis distances, nine outliers were detected and removed from the analyses. The correlation matrix revealed no multicollinearity. Table 1 reveals the intercorrelations, means, and standard deviations for criteria and predictors.



**Table 1***Intercorrelations, Means, and Standard Deviations for Criteria and Predictors*

Variable	Mean	SD	1	2	3	4	5	6	7	8
Social Conservatism (1)	62.03	17.42								
Economic Conservatism (2)	50.06	13.88	0.37**							
Conspiracy Mentality (3)	63.12	17.76	0.08	-0.05						
Automatic vs Mindful Thought Processing (4)	2.50	0.74	0.08	-0.12	0.03					
Locus of Media Control (5)	2.67	0.58	0.03	0.04	0.17	0.29**				
Social Media Use (6)	2.28	0.70	-0.03	-0.01	0.18	0.29**	-0.01			
Face Mask Perceptions (7)	2.34	1.05	-0.03	0.20*	0.38**	0.25**	0.09	0.20*		
Vaccine Attitudes (8)	4.18	1.08	0.08	-0.16	-0.41**	0.01	-0.13	-0.10	-0.64**	
Vaccine Eligibility (9)	0.69	2.29	-0.06	0.04	0.27**	0.02	0.13	0.01	0.50**	-0.57**

n = 108. \*  $p < .05$ , \*\*  $p \leq .001$

Table 2 displays the outcome of the multiple regression for predicting average scores on the FMPS (Howard, 2020). As can be seen in Table, 2, the overall model was statistically significant,  $F(6, 99) = 5.82$   $p < .001$ , with  $R^2 = .28$ . However, only economic conservatism, conspiracy mentality, and automatic vs. mindful thought processing were significant predictors. Economic conservatism had the greatest contribution to prediction, followed by conspiracy mentality, and then automatic vs. mindful thought processing. The signs of the coefficients indicate that as economic conservatism, conspiracy mentality, and mindful thought processing increases, negative perceptions towards face masks also increase, which lends partial support to the first hypothesis.

**Table 2***Predictors of Face Mask Perceptions*

Variable	Face Mask Perceptions		
	<i>B</i>	$\beta$	<i>sr</i> <sup>2</sup>
Constant	-0.66		
Social Conservatism	-0.01	-0.15	0.02
Economic Conservatism	0.03**	0.36	0.10
Conspiracy Mentality	0.02**	0.33	0.10
Automatic vs. Mindful Thought Processing	0.50*	0.33	0.07
Locus of Media Control	-0.21	-0.12	0.01
Social Media Use	0.13	0.09	0.01
<i>R</i> <sup>2</sup>		0.28	
<i>F</i>		5.82**	
Note. <i>n</i> = 99, * <i>p</i> <.05, ** <i>p</i> ≤ .001			

A similar pattern emerged for predicting vaccine attitudes. Table 3 displays the outcome of the multiple regression for predicting average scores on the VAX Scale (Martin & Petrie, 2017). The overall model was statistically significant  $F(6, 99) = 4.46, p <.001$ , with  $R^2 = .23$ . Once again, economic conservatism and conspiracy mentality contributed significantly to the prediction of vaccine attitudes. It should be noted that social conservatism approaches significance. Conspiracy mentality had the greatest contribution to prediction followed by economic conservatism. The signs of the coefficients indicate that as economic conservatism and conspiracy mentality increases, negative perceptions towards face masks also increase, which supports the first hypothesis.

### **Table 3**

#### *Predictors of Vaccine Attitudes*

Variable	Vaccine Attitudes		
	<i>B</i>	$\beta$	<i>sr</i> <sup>2</sup>
Constant	6.87**		
Social Conservatism	0.01	0.17	0.02
Economic Conservatism	-0.03**	-0.36	0.10
Conspiracy Mentality	-0.02**	-0.37	0.13
Automatic vs Mindful Thought Processing	-0.17	-0.11	0.01
Locus of Media Control	-0.04	-0.02	0.00
Social Media Use	-0.04	-0.03	0.00
<i>R</i> <sup>2</sup>		0.23	
<i>F</i>		4.46**	
Note. <i>n</i> = 99, * <i>p</i> < .05, ** <i>p</i> ≤ .001			

The outcome of the multiple regression for predicting the distance in months from when participants became eligible to when they received their first COVID-19 vaccine were not significant as displayed in Table 4,  $F(6,99) = 0.87$ ,  $p = 0.518$ , with  $R^2 = .05$ . No predictors contributed significantly to the prediction of vaccine eligibility behaviors, which was not consistent with the hypotheses.

**Table 4**

*Predictors of Vaccine Eligibility*

Variable	Vaccine Eligibility		
	<i>B</i>	$\beta$	<i>sr</i> <sup>2</sup>
Constant	-2.38		
Social Conservatism	0.02	0.13	0.01
Economic Conservatism	0.01	0.08	0.01
Conspiracy Mentality	0.01	0.13	0.02
Automatic vs Mindful Thought Processing	0.05	0.02	0.00
Locus of Media Control	0.16	0.05	0.00
Social Media Use	-0.11	-0.04	0.00
<i>R</i> <sup>2</sup>		0.05	
<i>F</i>		0.87	
Note. <i>n</i> = 99, * <i>p</i> < .05, ** <i>p</i> ≤ .001			

Participants were separated into groups based on their selection of one of three hypothetical face mask behaviors: ‘Not likely at all’, ‘Somewhat likely’, or ‘Very likely’. A series of one-way ANOVAs were conducted to determine whether social conservatism,

economic conservatism, conspiracy mentality, automatic versus mindful thought processing, locus of media control, and daily social media use ratings significantly differed across those who selected one of the three hypothetical face mask behaviors. The assumptions were satisfied, and nine outliers were removed. A Bonferroni correction was used to limit inflation of experiment-wise alpha. The outcome of the test revealed that social conservatism ratings significantly differed across face mask behaviors  $F(2, 99) = 5.04, p = .008, \eta^2 = 0.10$ . Post-hoc analysis with the Scheffé procedure revealed that social conservatism ratings for those ‘Not likely at all’ to wear a face mask if restrictions were lifted were significantly lower compared with those ‘Somewhat likely’ and those who were ‘Very likely’, which lend partial support to the first hypothesis. No other differences were significant. Table 5 contains descriptive statistics for each condition.

**Table 5**

*Means and Standard Deviations for Hypothetical Face Mask Behaviors*

Variable		N	Mean	SD	SE
Social Conservatism	Not At All Likely	20	53.84	19.54	4.37
	Somewhat Likely	35	67.62	13.54	2.29
	Very Likely	44	64.79	15.73	2.37
	Total	99	63.58	16.50	1.66
Economic Conservatism	Not At All Likely	20	53.89	16.59	3.71
	Somewhat Likely	35	51.36	12.71	2.15
	Very Likely	44	47.72	11.77	1.77
	Total	99	50.25	13.28	1.33
Conspiracy Mentality	Not At All Likely	20	69.40	19.40	4.34
	Somewhat Likely	35	64.38	15.13	2.56
	Very Likely	44	61.50	17.18	2.59
	Total	99	64.11	17.05	1.71
Automatic vs Mindful Through Processing	Not At All Likely	20	2.23	0.60	0.13
	Somewhat Likely	35	2.49	0.58	0.10
	Very Likely	44	2.57	0.68	0.10
	Total	99	2.47	0.64	0.06
Locus of Media Control	Not At All Likely	20	2.67	0.54	0.12
	Somewhat Likely	35	2.71	0.57	0.10
	Very Likely	44	2.62	0.46	0.07
	Total	99	2.66	0.52	0.05
Social Media Use	Not At All Likely	20	2.07	0.67	0.15
	Somewhat Likely	35	2.34	0.70	0.12
	Very Likely	44	2.31	0.75	0.11
	Total	99	2.27	0.72	0.07
n = 99.					

In an exploratory fashion, an additional standard multiple regression analysis was performed to predict the distance in months from when participants became eligible to when they received their first COVID-19 vaccine (on a scale from -4 to 8, with a value of 8 representing those who had not received a COVID-19 vaccine seven months after becoming eligible) from two predictors: average FMPS scores (Howard, 2020) and average VAX scale scores (Martin & Petrie, 2017). Visual inspections of the histogram of residuals and scatterplots of standardized residuals revealed that the assumptions of normality, linearity and homoscedasticity were satisfied. Based on the standardized residuals and Malanohabis distances, nine outliers were detected and removed from the analysis. The correlation matrix revealed no multicollinearity.

Table 6 displays the outcome of the multiple regression for vaccine eligibility behaviors. The overall model was statistically significant,  $F(2, 99) = 11.77, p < .001$ , with  $R^2 = .20$ . However, only the average VAX scale scores was a significant predictor. The sign of the coefficient indicates that as positive attitudes towards vaccines decrease, the number of months after becoming eligible for the vaccine to receiving a first dose increases.

**Table 6**

*Predictors of Vaccine Eligibility*

Variable	Vaccine Eligibility		
	<i>B</i>	$\beta$	$sr^2$
Constant	2.36		
Face Mask Perceptions	0.34	0.17	0.02
Vaccine Attitudes	-0.64*	-0.32	0.07
$R^2$	0.20		
$F$	11.77**		
Note. $n = 99$ , * $p < .05$ , ** $p \leq .001$			

Finally, average FMPS scores (Howard, 2020) and VAX scale scores (Martin & Petrie, 2017) were examined in relation to the three hypothetical face mask behaviors. The assumption

of normality was violated for those ‘Very likely’ to wear a face mask if restrictions were lifted. Consequently, the Kruskal-Wallis test was conducted on the remaining 105 cases to determine whether face mask perceptions and vaccine attitudes significantly differed across hypothetical face mask behaviors. The outcome of the test revealed that face mask perceptions significantly differed across hypothetical face mask behaviors  $H = 28.92$ ,  $p < 0.001$ . Vaccine attitudes also significantly differed across hypothetical face mask behaviors  $H = 34.76$ ,  $p < 0.001$ . Based on mean rank, those ‘Very likely’ had lower ratings on the FMPS (Howard, 2020) and higher ratings on the VAX scale (Martin & Petrie, 2017) compared with the other two conditions, indicating more positive perceptions of face masks and vaccines attitudes.

### **Discussion**

The COVID-19 pandemic has changed many aspects of people’s daily lives. Mandatory face mask and vaccination regulations have been met with varying degrees of acceptance, especially so in less populated regions. The purpose of this study was to examine if measures of conservatism, susceptibility to belief in conspiracy theories, social media literacy, and social media use were related to face mask and vaccine attitudes and behaviors in a rural Canadian setting. This was accomplished through the use of several established measures of the above-mentioned variables. It was predicted that increased susceptibility to belief in conspiracy theories and increased conservatism would be related to more negative face mask perceptions and attitudes towards vaccines. Both of these were supported by the results. However, it was also predicted that increased social media use and media literacy would be related to more positive perceptions of face masks and vaccine attitudes, which were not supported by the results. Altogether, the pattern of results sheds light on psychological factors that contribute to

acceptance of public health recommendations and could be useful to policy makers seeking targeted approaches to public health.

Conspiracy mentality was found to be a significant predictor of both face mask perceptions and vaccine attitudes. Those highly susceptible to belief in conspiracy theories may have more negative perceptions of face masks and vaccines as these behaviors are condoned and mandated by the government, which this group tends to challenge (Matinthe et al., 2020). Previous research has also shown that simple exposure to conspiracy theories surrounding vaccines lead to greater fear, lower trust, and lower intentions to vaccinate (Jolley & Douglas, 2014). Given the mass exposure of conspiracy theories related to COVID-19, face masks, and vaccines through news media, social media, and word of mouth, it is likely that the average individual was exposed to at least some misinformation. Further, despite the government's links to science supported information on all posts related to COVID-19, posts containing misinformation may continue to exist on social media platforms. As conspiracy mentality was consistently a significant predictor, the spread of misinformation and conspiratorial beliefs surrounding COVID-19 remains an issue. Currently, efforts to combat misinformation has centered on redirecting people to the proper channels with evidence-based facts supported by science. Increased efforts should focus on finding another way to appeal to those with higher conspiracy mentality, importantly by removing misinformation and potentially using an emotions-based approach, such as appealing to their senses about protecting their family, as they are unlikely to trust in scientific sources.

The evidence supporting conservatism as a predictor of face mask perceptions and vaccine attitudes was mixed, which is consistent with the mixed findings on conservatism and health-related behaviours. On the one hand, those high in conservatism tend to be more

pathogen-threat avoidant (Samore et al., 2021), which should increase compliance with public health measures. On the other hand, previous studies (Barbieri & Bonini, 2021; Samore et al., 2021) have found lower rates of public health compliance amongst conservative individuals. In the present study, conservatism as a whole was not a significant predictor of face mask perceptions or vaccine attitudes, however when considering different facets of conservatism, economic conservatism was found to be a significant predictor of both face mask perceptions and vaccine attitudes, while social conservatism was approaching significance as a predictor of vaccine attitudes. Social conservatism was also found to differ significantly amongst hypothetical face mask behaviors, specifically amongst those who were 'Not at all likely' to wear face masks if restrictions were lifted. These results may suggest that specific facets of conservatism may be more pressing in relation to concerns over COVID-19 precautions rather than conservatism as a whole. Everett (2013) notes that it is useful to distinguish between social and economic conservatism as it is possible for both individuals and political parties to vary in their level of conservatism along these dimensions so that one could be economically conservative while socially liberal or economically liberal while socially conservative. Thus, the primary hypothesis was partially supported: for economic conservatism, increased scores were related to more negative perceptions of face masks and vaccine attitudes.

Economic conservatism refers to attitudes connected with the government's involvement and regulation of the economic lives of its citizens (Everett, 2013). People who are concerned about the economy would be less likely to be supportive of mandates that place financial strain on business. Economic conservatism may be related to less favorable attitudes of COVID-19 measures due to their effect on the economic well being of the country and by extension apply this to face mask and vaccine regulations which at the time of data collection limited one's



access to public business and employment opportunities. Further, the restrictions and mandates requiring face masks and vaccines reflect a direct involvement in the lives of the general public by the government.

Social conservatism is tied to the belief that political problems are religious and moral problems and reflects a desire to maintain traditional morals (Everett, 2013). Face masks could be a threat to social conservatives' social values of independence and freedom of expression (Samore et al., 2021). Further, conservatives tend to demonstrate lower trust in science (Samore et al., 2021) which may conflict with traditional religious beliefs, leading to more negative attitudes about vaccines. The results showed that those 'Not at all likely' to wear a face mask if restrictions were lifted had lower social conservatism ratings than those 'Somewhat likely' and those 'Very likely'. While conservatives have not shown high compliance throughout the pandemic (Samore et al., 2021), the Behavioral Immune System (BIS) may be eliciting a response of disease avoidance by continuing to wear face masks, as the BIS has consistently been associated with socially conservative attitudes (Kempthorne & Terrizzi, 2021).

While people tend to follow the health advice they obtain online (Niu et al., 2021) and the government of Canada has implemented mandatory COVID-19 fact checking information warnings to all posts containing mentions of the pandemic or vaccines to combat misinformation, the amount of time spent on social media was not a significant predictor of perceptions of face masks and vaccine attitudes or behaviors. Previous studies on social media and COVID-19 compliance had mixed results. There is some evidence that indicates high informational reliance on social media is related to vaccine hesitancy (Allington et al., 2021). However, increased social media use for health information is related to increased health literacy (Niu et al., 2021). In the present study, it is possible that these two previous findings canceled each other out, as people

may be using social media to reinforce their own views and are not exposing themselves to alternative viewpoints. Furthermore, participants in the present study may not have relied on social media as a primary source of information about the pandemic. Social media may have been a source of constant anxiety about COVID-19, which individuals may have wanted to ignore by using platforms in a more entertainment fashion to avoid negative arousal.

Media literacy, as tested through the dimensions of automatic versus mindful thought processing and locus of media control, was not found to be significant predictors of vaccine attitudes, while only automatic versus mindful thought processing was found to be a significant predictor of face mask perceptions. Referring to one's knowledge and motivations to engage with news information, media literacy is important in assessing information gleaned through media outlets such as the news or online. As with social media use, participants may not have been engaging with news media related to the pandemic due to the feelings of anxiety that may have accompanied such information. This may be particularly relevant for why locus of media control, the degree to which you believe you are in control of the media's influence (Maksl et al., 2015), was not found to be a significant predictor. If you were not engaging with media, then you would not be concerned about the influence it presents in your life. Automatic versus mindful thought processing, which is the degree to which participants are motivated to engage with cognition or enjoy thinking and are motivated to consume news media, reflective of their skepticism (Maksl et al., 2015) was found to be a significant predictor of face mask perceptions. People who are more mindful in their processing of information may be less likely to take the information about face masks they find online at face value and instead engage in more in-depth searches of health information from a variety of sources leading them to come to their own conclusions and thoughts about face masks. However, increased motivation to consume media

from a variety of sources is not equivalent to having knowledge of media structures and thus those with more mindful thought processing may not be able to make much sense of what they are being exposed to (Maksl et al., 2015).

In an exploratory fashion, the predictive capacity of face mask perceptions and vaccine attitudes on face mask and vaccine behaviors was further explored. Face mask perceptions and vaccine attitudes significantly differed across three hypothetical face mask behaviors. Given a choice to choose not to wear a face mask, one would predict that those who hold more negative attitudes towards face masks would be more likely to not wear them if restrictions were lifted. The results of this study confirmed the prediction whereby the mean rank of those ‘Not at all likely’ was significantly different from those ‘Very likely’ to wear a face mask for average FMPS (Howard, 2020) scores. Thus, those who were ‘Not at all likely’ to wear a face mask held more negative perceptions of face masks.

Lastly, vaccine attitudes also predicted vaccine eligibility behaviors. This is consistent with the belief that vaccine attitudes are related to vaccine behaviors. Those with less favorable attitudes about vaccines waited more months after their eligibility date (May 2021) for the COVID-19 vaccine before receiving their first dose than those with more positive attitudes.

### **Limitations**

The interpretation of the present findings is not without some limitations. First, participants were recruited exclusively from introductory psychology classes and primarily consisted of young adults in their late teens and early twenties, which may not be representative of the attitudes of Manitoba’s rural adult population, specifically concerning factors such as conservatism as university students tend to be more liberal. It should be noted, however, that the distribution of conservative attitudes was normal in shape in this sample. Second, due to the

government and university regulations at the time of data collection, face masks and vaccination were required to attend campus in-person. While introductory psychology classes remained online and allowed unvaccinated students to register, face mask behaviors were studied using a hypothetical question while the number of unvaccinated participants was low in comparison with provincial rates. Finally, although the study was anonymous, there may have been demand characteristics on participants to respond in a socially desirable way consistent with the university's COVID-19 policy.

### **Future Research and Conclusion**

Studies looking at conservatism as a factor in relation to COVID-19 compliance should consider dividing conservatism into subscales of social and economic conservatism as it was demonstrated in this study that one might have more influence than the other. With face mask restrictions now lifted in many provinces in the country, including in Manitoba, research can now look at face mask behaviors directly instead of using a hypothetical question. In conclusion, this study demonstrates the significance of conspiracy mentality and economic conservatism in the prediction of face mask perceptions and vaccine attitudes as well as the significance of automatic versus mindful thought processing in the prediction of face mask perceptions. Locus of media control and social media use were not found to be significant predictors of face mask perceptions or vaccine attitudes. Further, no significant predictors of vaccine hesitancy behaviors were found.

These findings are consistent with the findings of previous COVID-19 compliance research for conservatism and conspiracy mentality. The results of this study have real world implications in our approach to encourage compliance with COVID-19 precautions. More effort

should be given to combating misinformation and conspiracy theories surrounding the virus and addressing the economic concerns of individuals.

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