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Résumé de l'article

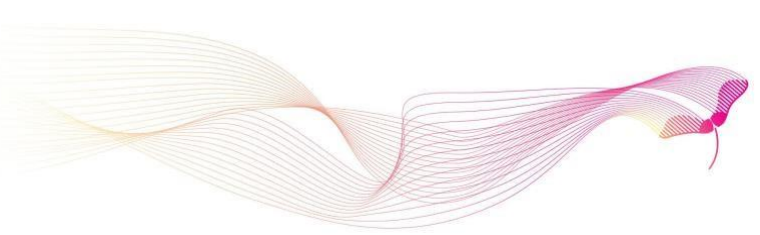
Cette étude examine les relations entre les attributs démographiques des adultes plus âgés, les difficultés en recherche et la découverte de l'information entourant la pandémie de COVID-19, et le scepticisme quant à l'efficacité des mesures de prévention du COVID-19 (distanciation sociale, port de masque, bonne hygiène). Une enquête de 12 questions a été distribuée sur la plateforme Amazon Mechanical Turk à la fin du mois de juin 2021 et a reçu 400 réponses. Les résultats indiquent que le sexe, l'affiliation politique, le statut relationnel, la proximité familiale et le contrôle familial perçu sur les préférences de la source d'information sont les plus grands prédicteurs de lacunes élevées en matière d'information et de scepticisme envers la prévention du COVID-19. Plus précisément, dans cette étude, les hommes mariés, conservateurs et ayant des liens familiaux étroits ont souvent exprimé un manque d'information et un scepticisme élevé à l'égard du COVID-19.

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Factors contributing to COVID-19 skepticism and information gaps among older adults in the United States and Canada: An analysis of nationality, gender, education, family, and politics

Facteurs contribuant au scepticisme et au manque d'information sur la COVID-19 chez les personnes âgées aux États-Unis et au Canada : une analyse de la nationalité, du sexe, de l'éducation, de la famille et de la politique

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Abstract: This study examines relationships between demographic attributes of older adults, information challenges surrounding the COVID-19 pandemic, and skepticism about the efficacy of COVID-19 preventative measures (social distancing, mask wearing, good hygiene). A 12-question survey was distributed on the Amazon Mechanical Turk platform in late June 2021, receiving 400 responses. Findings indicate that gender, political affiliation, relationship status, family closeness, and perceived family control over one's information source preferences are the greatest predictors of elevated gaps in information and skepticism towards COVID-19 prevention. Specifically, in this study, married, conservative men with close family ties often expressed elevated inadequacy of information and COVID-19 skepticism.

Keywords: coronavirus, COVID-19, information seeking, skepticism, older adults

Résumé : Cette étude examine les relations entre les attributs démographiques des adultes plus âgés, les difficultés en recherche et la découverte de l'information entourant la pandémie de COVID-19, et le scepticisme quant à l'efficacité des mesures de prévention du COVID-19 (distanciation sociale, port de masque, bonne hygiène). Une enquête de 12 questions a été distribuée sur la plateforme *Amazon Mechanical Turk* à la fin du mois de juin 2021 et a reçu 400 réponses. Les résultats indiquent que le sexe, l'affiliation politique, le statut relationnel, la

proximité familiale et le contrôle familial perçu sur les préférences de la source d'information sont les plus grands prédicteurs de lacunes élevées en matière d'information et de scepticisme envers la prévention du COVID-19. Plus précisément, dans cette étude, les hommes mariés, conservateurs et ayant des liens familiaux étroits ont souvent exprimé un manque d'information et un scepticisme élevé à l'égard du COVID-19.

Mots clés : coronavirus, COVID-19, recherche d'informations, scepticisme, adultes âgés

During the COVID-19 pandemic, there have been significant divides among people's beliefs about the effectiveness of preventative measures like social distancing, mask wearing, good hygiene, and vaccination, as well as access to and ability to parse through accurate information about the disease. Conflict over mask mandates, the reliability of different information sources, and the safety of vaccines have been the center of political debate in the United States and, perhaps to a lesser extent, in Canada (Pennycook et al. 2021). Though several recent studies have examined demographic factors that correlate or contribute to greater information needs or skepticism about COVID-19 and vaccination, few studies have examined whether similar factors impact older adults' information behaviors, who represent a unique and particularly vulnerable population during the era of the COVID-19 pandemic. By examining these factors in a large multi-national survey, we may better understand and address harmful information gaps and virus misperceptions in the future.

Literature review

Older adults' information behaviors—the sources of information they use, types of information they need, the process of seeking and sharing information—have been examined by several researchers in the last three decades (Chatman 1992; Pálsdóttir 2012; Wicks 2004; Williamson 1998). These studies show that older adults tend to rely, more so than younger adults, on information sought through interpersonal relationships, whether part of close personal networks (like family and friends) or wider networks (like coworkers and community members), and to a lesser extent information acquired through mass media like television and newspapers. Though these studies have some limitations (such as focusing on older adults in assisted living facilities, even though over 90% of older adults live independently), they have largely filled the general gap in knowledge about older adults' information behavior during “normal” circumstances.

Few studies, however, have examined older adults' information behaviors during the COVID-19 pandemic—a context that is far from “normal.” It is a context where access to other people as a source of information may be limited due to social distancing, forcing individuals to increasingly turn to mass media sources and the Internet, and one where online misinformation abounds. Zhao et al. (2020) conducted a targeted study of online information seeking in Wuhan, China that included a considerable number of older adult participants, though the focus of the study was the use of Weibo, a Chinese social media platform. El Skarpa and Garoufallou (2021) focused on misinformation risks and information source usage among young, middle,

and older aged individuals, with some differences found among the perceptions among these groups. Chu et al. (2021) compared information sources used by younger and older adults during the early months of the COVID-19 pandemic. However, none of these studies examined in detail the demographic factors within this older adult group that might lead to certain COVID-19-specific behaviors (seeking information about COVID-19, trust in information sources, skepticism towards the COVID-19 prevention measures). Given the limitations of these studies, there is plenty of opportunity for further exploration of information beliefs and behaviors during the COVID-19 pandemic.

Several factors have been found to relate to increased avoidance or skepticism of COVID-19 information and prevention practices among younger populations: religiosity and conservative political ideology (Choma et al. 2020; Leibovitz et al. 2020; Miller 2020; Taylor et al. 2020); marital status, with those who are married being more skeptical (Al-Mohaithef 2020; M Chen et al. 2020; Y Chen et al. 2020; J Wang 2020); gender, with men being more skeptical (M Chen et al. 2020; Ng 2020; J Wang 2020); academic attainment, with those with less education being more skeptical (Lazarus et al. 2020; Taylor et al. 2020). Additionally, preferred types of media consumption were found by Romer and Jamieson (2021) to relate to COVID-19 prevention behavior, with those who watch mainstream television being more inclined to wear masks and plan to get a COVID-19 vaccine. These studies, however, have focused on younger adults and have captured only a point of time in an evolving pandemic situation. Further studies with an older adult population may confirm or challenge past findings and reveal additional insights relative to studies of younger populations.

Some recent studies have also noted possible variation in COVID-19 beliefs and practices based on nationality, with several of these studies focusing on comparisons between residents of the United States and Canada. Early in the pandemic, Pickup, Stecula, and van der Linden (2020) examined political partisanship and attitudes towards COVID-19 in Canada and the United States. The researchers found that both conservatives and liberals in Canada held similar levels of concern about the pandemic, while in the United States perspectives were significantly more polarized between conservatives and liberals. Pennycook et al. (2021) found very similar results, with political conservatives in the United States expressing greater misperceptions about the virus and greater vaccine hesitancy relative to other countries. Donna Wang et al. (2021) found that Canadians adapted more easily to the pandemic and felt overall less impact relative to Americans. Americans also tended to rely on family as significant sources of information relative to Canadians, who sought official government sources.

Libraries have served an important role during the COVID-19 pandemic, providing valuable information for the public during this turbulent time (Dalmer and Griffin 2021; Intahchompoo and Brown 2021; Menard 2021; Wang and Lund, 2020). These institutions impact the lives of older adults by serving as a source for the development of digital literacy skills and the acquisition of reliable information (Lenstra et al. 2021). By better understanding the factors that contribute to information gaps and virus misperceptions, it may be possible (both in the current COVID-19 pandemic and in future pandemic and public health situations) to better disseminate information to particularly vulnerable and skeptical populations. This is especially important with

populations who have generally been ignored in both COVID-19 and librarianship research, such as the older adult population.

Methods

Four hundred participants were recruited in late June 2021 from Amazon's Mechanical Turk (MTurk) platform, which serves as a job board for small programming and online labor projects as well as academic and market research surveys. MTurk has been previously used in several successful information behavior studies (Qu et al. 2018; Wang and Shah 2016). Only adults aged 60 and older were able to participate and all participants were required to live either in the United States or Canada. There is some disagreement in the literature as to whether "older age" starts at age 60 or 65; however, many recent studies related to the COVID-19 pandemic have used the age of 60, considering that this appears to be the age at which risk of severe COVID-19 grows substantially (Bonanad et al. 2020; Osama et al. 2020). Additionally, age 60 is the cut-off age used by Williamson (1998) in her study of older adults' information behaviors. The survey was kept short to reduce fatigue and speed up the data collection process, with only twelve questions included. A copy of the survey instrument is included in Appendix A.

The population of users on Mechanical Turk tend to skew male and higher educated (as shown in Table 2 in the results section). This may limit the representativeness for female and less educated populations; however, this skew may be less problematic with inferential statistical analysis, which focuses on the relationships between variables rather than counting of frequencies and has been used with several regression-based studies related to COVID-19 (Hamutoglu and Basarmak 2020; Verma and Mishra 2020). As noted by Levay et al. (2016), samples derived from Mechanical Turk are often more representative than those derived from any other convenience sampling approach, assuming that all responses are validated (checked for completeness and quality). The researchers in this study checked each response to the survey to ensure completeness and removed any that were incomplete or questionable (where there was potential evidence of the respondent selecting random answers—such as choosing option A for every question). The survey remained open until 400 suitable responses were attained, at which time the survey was closed, and the Mechanical Turk job was made no longer available for new participants.

Table 1 includes descriptions of each of the variables examined in this study (12 variables to align with the 12 survey questions). These variables were selected because they were shown in studies of younger adults (as discussed in the literature review) to be related to how individuals interacted with information during the COVID-19 pandemic—nationality, gender identity, academic achievement, relationship status, political ideology, and preferred sources of information—as well as a variety of information experiences during the pandemic—lack of needed information, hesitancy about vaccines, questioning the validity of preventative measures. Questions were either categorical (i.e., multiple choice) or Likert (selecting from a range). For the categorical variables, Kruskal Wallis H tests were used to analyze whether differences

existed in the Likert responses based on category; for instance, responses among Canadians and Americans were compared as to political affiliation and perceived effectiveness of COVID-19 prevention measures. All Likert item responses were compared to one another using a Spearman correlation matrix (i.e., examining the relationship between increased liberal affiliation and perceived effectiveness of COVID-19 prevention measures).

Variable	Description
Nationality	Respondents select one of two options, based on their nationality: United States or Canada. A dummy variable was used for regression analysis, where the U.S. was represented by the value 0 and Canada by the value 1.
Gender	Respondents select one of three options, based on their gender identity: male, female, or nonbinary. No respondents, however, selected the nonbinary option. A dummy variable was used for regression analysis, where male was represented as 0 and female as 1.
Age	Respondents select one of three options: 60-70, 71-80, 81+. The 71-80 and 81+ categories were combined by the researchers into one 71+ category. A dummy variable was used for regression analysis, where under 70 was represented as 0 and 71+ was represented as 1.
Academic Achievement	Respondents select one of five options: Less Than High School Graduate, High School Graduate, Undergraduate Degree, Graduate or Professional Degree, Doctoral Degree. These five categories were combined into two: Undergraduate degree or less and Graduate degree or more. A dummy variable was used for regression analysis, where Undergraduate degree or less was represented as 0 and Graduate degree or more as 1.
Relationship Status	Respondents select one of five options: single, in a relationship (not married), married, widowed, other. These five categories were combined into two: married and not married. A dummy variable was used for regression analysis, where not married was represented as 0 and married as 1.
Political Affiliation	Respondents select one option on a five-point Likert scale. The scale mirrors the political spectrum, with very conservative being represented as 1, conservative as 2, neutral as 3, liberal as 4, and very liberal as 5.
Family Closeness	Respondents select one option on a five-point Likert scale. Not at all close was represented as 1, not very close as 2, somewhat close as 3, close as 4, and very close as 5.

Family Influence Info Source Preference (Family Info Influence)	Respondents select one option on a five-point Likert scale, to indicate how much they agree with the statement that their family influences the sources of information they consume. Agree not at all was represented as 1, agree very little as 2, somewhat agree as 3, agree as 4, and strongly agree as 5.
Media Coverage Overblown	Respondents select one option on a five-point Likert scale, to indicate how much they agree with the statement that media coverage about the COVID-19 pandemic has been overblown. Agree not at all was represented as 1, agree very little as 2, somewhat agree as 3, agree as 4, and strongly agree as 5.
Vaccine Has Serious Risks	Respondents select one option on a five-point Likert scale, to indicate how much they agree with the statement that the COVID-19 vaccine has serious health risks. Agree not at all was represented as 1, agree very little as 2, somewhat agree as 3, agree as 4, and strongly agree as 5.
Difficulty Find Reliable Info	Respondents select one option on a five-point Likert scale, to indicate how much they agree with the statement it is difficult to find reliable information about the COVID-19 pandemic. Agree not at all was represented as 1, agree very little as 2, somewhat agree as 3, agree as 4, and strongly agree as 5.
COVID Measures Effective	Respondents select one option on a five-point Likert scale, to indicate how much they agree with the statement that COVID-19 preventative measures like social distancing and mask wearing actually effective in slowing the spread of the disease. Agree not at all was represented as 1, agree very little as 2, somewhat agree as 3, agree as 4, and strongly agree as 5.

Table 1: Description of Each of the Variables in this Study and Possible Values

Lastly, two regression analyses were performed, based on two key dependent variables: that it is difficult to find reliable information about the COVID-19 pandemic and that COVID-19 preventative measures are effective to slow its spread. The remaining variables—were included as explanatory (independent) variables in each of the regression models.

Results

As noted in the methods section, the demographics of respondents from the Amazon Mechanical Turk platform are skewed, and this is reflected in the demographic profile of survey respondents in Table 2. The respondents were considerably more male

(59.8%) than the general population (~50%), were younger (larger percentage in the 60-70 age range and lower in the 71-80 or 81+ age range compared to the overall older adult population) and had a higher academic attainment (48.4% had a graduate degree or higher). The non-representativeness of a sample can bias findings to an extent, and should be noted as a limitation; however, convenient (non-probability) sampling is commonly used in information science research to infer trends across population demographics, and Amazon Mechanical Turk is one of the better ways to acquire a non-biased, convenient sample—as opposed to posting a local advertisement or sending out advertisements on social media or a listserv (Marcial and Hemminger 2010; Rubin 2011).

Variable	Percentage of Respondents
Gender	
Male	59.8%
Female	40.2%
Age	
60-70	92.6%
71-80	5.7%
81+	1.7%
Marital Status	
Married	75.8%
Not Married	24.2%
Educational Attainment	
Undergraduate or Less	52.1%
Graduate Degree	47.9%
Country	
United States	78%
Canada	22%

Table 2: Demographic Profile of Survey Respondents

Table 3 displays the median values for each of the categorical variables (nationality, gender, age, educational attainment, marital status). Kruskal-Wallis H tests (a non-parametric ANOVA) was used to evaluate statistically significant differences among groups. For U.S. and Canadian respondents, the only statistically significant difference was in regard to the belief that COVID-19 prevention measures (social distancing, masking, etc.) are effective, with Canadian respondents having stronger belief in the efficacy of these measures. Females, relative to males, were less inclined to believe that media coverage of COVID-19 is overblown, less likely to say that vaccines have serious risks, reported less difficulty in finding reliable COVID-19 information, and believed COVID-19 prevention measures are more effective than their counterparts did.

No statistically significant differences were found based on age. Those with less education were more politically conservative, less influenced by family in their information behaviors, less likely to say that COVID-19 media coverage is overblown, and less convinced that COVID-19 prevention measures are effective. Those

participants who were married indicated much greater family closeness, more influence of family on information behaviors, more convinced of media coverage being overblown, believed vaccines have more serious risks, and indicated COVID-19 information is difficult to find. American, married males with an undergraduate education or less were the most likely among these demographic groups to be skeptical about COVID-19 information and prevention measures.

Variables	Political Affiliation	Family Closeness	Family Info Influence	Media Coverage Overblown	Vaccination Has Serious Risks	Difficult Finding Reliable Info	COVID Measures Effective
Average of All Respondents	3.14	3.96	3.64	3.54	3.09	3.18	3.96
United States	3.13	3.96	3.66	3.53	3.08	3.16	3.93*
Canada	3.17	3.94	3.57	3.59	3.12	3.24	4.07*
Male	3.15	3.96	3.70	3.66*	3.22*	3.28*	3.88*
Female	3.12	4.00	3.54	3.37*	2.89*	3.02*	4.07*
60-70	3.13	4.00	3.66	3.56	3.11	3.18	3.96
71+	3.27	3.84	3.33	3.33	2.73	3.20	3.87
Undergraduate or Less	3.04*	3.96	3.52*	3.37*	3.05	3.09	3.87*
Graduate Degree	3.24*	4.00	3.76*	3.72*	3.12	3.27	4.05*
Married	3.13	4.15*	3.75*	3.64*	3.20*	3.30*	3.97
Not Married	3.20	3.35*	3.29*	3.23*	2.74*	2.79*	3.92

*Significant Difference at $p < .01$

Table 3: Comparison for Median Values for Categorical Data (Gender, Age, Academic Achievement, Relationship Status)

Table 4 shows the Spearman correlation matrix for all the Likert-type data in the study. Greater political conservativeness was associated with greater skepticism about the effectiveness of COVID-19 prevention measures, but not about media coverage, vaccine risks, or difficulty in finding reliable information. The three variables of media coverage being overblown, vaccinations having serious risks, and difficulty finding reliable information are all moderately-well correlated with one another (according to the correlation interpretation guidelines supplied by Akoglu [2018]).

Variables	Political Affiliation	Family Closeness	Family Info Influence	Media Coverage Overblown	Vaccination Has Serious Risks	Difficult Finding Reliable Info	COVID Measures Effective
Political Affiliation	--	.03	-.01	-.03	.02	.02	-.13*

Family Closeness	.03	--	.22*	.18*	.00	.06	.17*
Family Info Influence	-.01	.22*	--	.32*	.32*	.30*	.16*
Media Coverage Overblown	-.03	.18*	.32*	--	.35*	.45*	.06
Vaccine Has Serious Risks	.02	.00	.32*	.35*	--	.43*	.04
Difficulty Find Reliable Info	.02	.06	.30*	.45*	.43*	--	.03
COVID Measures Effective	-.13*	.17*	.16*	.06	.04	.03	--

*Significant at $p < .01$

Table 4: Correlation Matrix for this Study's Variables

Figure 1 presents a path model of the relationships based on two dependent variables examined in this study: difficulty finding reliable information and belief in effectiveness of COVID-19 preventative measures. Tables 5 and 6 below will present the finding for all independent variables (including ones that are not statistically significant contributors). Notably, one variable, family's influence on the information sources that an individual uses, is a significant contributor for both dependent variables. Beyond this one variable, the predictors of the two dependent variables are distinct. As discussed below, the r^2 values for these regression analyses are relatively weak but are statistically significant (there are likely a myriad of additional factors that influence COVID-19 information gaps and COVID-19 skepticism than just the ones examined in this study).

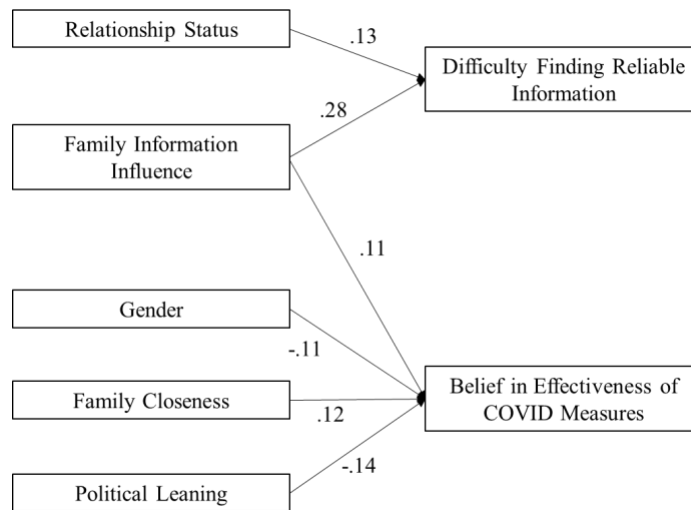


Figure 1: Depiction of Variables Predicting Difficulty in Finding Reliable COVID Information and COVID Skepticism (with Standardized b Regression Coefficients)

Shown in Table 5 are the regression statistics for difficulty finding reliable information about COVID-19. A significant regression equation was found ($F(7, 393) = 7.6, p < .001$), with an r^2 of .12. Only two variables are statistically significant contributors to the regression: relationship status (those who are married are likely to feel that finding reliable information is more difficult) and family influence on information source preference (those who are more strongly persuaded by family are

more likely to express having difficulty finding information). Participants' predicted difficulty in finding reliable information (on a five-point Likert scale) is equal to $1.63 + .37$ (Relationship Status) + $.33$ (Family Information Influence), where the value for Relationship Status is either Married (1) or Not Married (0) and Family Information Influence is measured on a five-point Likert scale.

Parameter	Unstandardized Coefficients		Standardized	T	Sig.
	B	Standard Error	B		
Intercept	1.63	.30		5.42	.00
Nationality (Canada)	-.06	.11	-.03	-.53	.59
Gender Identity (Female)	.18	.12	-.07	-1.54	.12
Age (71+)	.06	.22	.01	.26	.79
Academic Achievement (High)	.08	.12	.03	.68	.49
Political Affiliation (Liberal)	.03	.06	.03	.64	.53
Family Closeness (Close)	-.04	.15	-.01	-.27	.79
Relationship Status (Married)	.37	.14	.13	2.69	.01
Family Info Influence (Strong)	.33	.06	.28	5.55	.00

Table 5: Regression Analysis for Difficult to Find Reliable Information

Shown in Table 6 are the regression statistics for belief in the effectiveness of COVID-19 prevention measures. A significant regression equation was found ($F(7, 393) = 4.2, p < .001$), with an r^2 of .07. Four variables are statistically significant contributors to the regression: gender (women are more likely to believe in the effectiveness of COVID-19 measures) family closeness (those who are closer to family are more likely to believe measures are effective), political affiliation (those who are more politically liberal are more likely to believe in the effectiveness of measures) and family influence on information source preference (those who are more strongly persuaded by family are more likely to believe in the effectiveness of measures). Participants' predicted beliefs in the effectiveness of COVID-19 measures (on a five-point Likert scale) is equal to $2.83 + .21$ (Gender) + $.12$ (Political Affiliation) + $.28$ (Family Closeness) + $.11$ (Family Information Influence), where the value for Gender is either Female (1) or Male (0) and Political Affiliation, Family Closeness, and Family Information Influence are measured on five-point Likert scales.

Parameter	Unstandardized Coefficients		Standardized	T	Sig.
	B	Standard Error	B		
Intercept	2.83	.24		11.71	.00

Nationality (Canada)	.05	.09	.03	.55	.59
Gender Identity (Female)	.21	.09	.11	2.25	.02
Age (71+)	-.03	.18	-.01	-.17	.86
Academic Achievement (High)	.14	.09	.07	1.49	.14
Political Affiliation (Liberal)	.12	.04	.14	2.80	.00
Family Closeness (Close)	.28	.12	.12	2.38	.01
Relationship Status (Married)	-.03	.11	-.01	-.23	.82
Family Info Influence (Strong)	.11	.05	.11	2.19	.01

Table 6: Regression Analysis for COVID Measures Effectives

Discussion

These analyses indicate several compelling insights about the relationships between demographic attributes, COVID-19 information gaps, and COVID-19 prevention skepticism. Age was not found to be a significant differentiator for any other variable; older (71+) and younger (60-70) older adults rate similarly on all other measured variables. All other variables, though, were found in the correlation and/or regression analysis to have a significant relation to one or more other variables. Gender identity, academic achievement, family closeness, relationship status, and family influence on information source preference are all influential on the belief that media coverage of COVID-19 is overblown. Gender identity, family closeness, relationship status, and family information influence were all also influential on the belief that the COVID-19 vaccines carry significant health risks, though academic achievement was not found to be influential with this variable. For "difficult to find reliable COVID-19 information," only relationship status and family information influence were found to be significant. For beliefs about the effectiveness of COVID-19 preventative measures, gender identity, political affiliation, family closeness, and family information influence were found to be significant. Only one variable was found to be influential across all four dependent variables: family influence on information source preference. It is the most influential variable in three of the four cases (only with beliefs about preventative measures is it not, with political affiliation being the strongest in that case).

From the comparison (Table 3) and correlation (Table 4) tables, we can further see that many of these variables are linked, if not directly influencing one another (as in the regression analysis). Education and political affiliation are found to be related, as is relationship status and family closeness. Beliefs about media coverage being overblown, vaccination having serious health risks, and difficulty finding reliable COVID-19 information are all moderately-well correlated, though not all have the same contributing variables in the regression analysis (so they are distinct, yet related). Surprisingly, beliefs about the effectiveness of COVID-19 preventative measures is not correlated to these other three measures and has a unique set of contributory factors (except for family influence on information source preference).

These findings suggest a complex interplay of factors that predict one's attitudes towards the COVID-19 pandemic among this survey sample. No single factor is necessarily a perfect, or even particularly strong, predictor of COVID-19 information gaps or prevention skepticism. Yet, a combination of factors evident in a respondent—such as conservative, married, and strong family ties—could be a powerful predictor of COVID-19 beliefs. It appears that the populations that are most in need of being reached with accurate COVID-19 information are populations with less education, more conservative, married, and with close family connections. These attributes align with many of the demographics of the supporters of former U.S. President Donald Trump, so perhaps it should not be surprising that they predict COVID-19 skepticism given that studies have shown that Trump supporters are more likely to be COVID-19 and vaccine skeptics (Evans and Hargittai 2020; Motta 2021).

Nationality—Canadian or American—was found to have only a very minimal effect on COVID-19 beliefs. The only statistically significant difference was in terms of the perceived effectiveness of COVID-19 prevention measures, where Canadian respondents were slightly more convinced about the effectiveness of these measures. However, Canadian respondents also skewed a bit more female and educated than the American respondents, which could partially explain this difference in beliefs. Both Canadians and Americans demonstrated similar beliefs about COVID-19 information gaps.

In the United States it is commonly believed that political affiliation is the strongest predictor of COVID-19 skepticism (Boyd 2021). While this study indicates that there is a relationship between political leaning and COVID-19 beliefs and information practices, it is actually not as strong of an influence as the role of family influence. We know from other studies of older adults' information experiences that close personal connections play a major role in their behavior (Williamson 1998; Wicks 2004; Pálsdóttir 2012). From the perspective of library services, this finding has potentially compelling implications for digital literacy instructional efforts, such as the value of encouraging older adults and grown children of older adults to participate in instruction and to share what they learn with close connections. Family of older adults may be seen as intermediaries between digital literacy experts (e.g., librarians) and the older adult who is unable or unwilling to participate in instruction. Even if it seems hopeless, mere exposure to a diversity of ideas and sources may change behavior at least to some small extent.

This study has a few limitations to note, some of which also invite opportunity for further research. The greatest potential limitation, noted in the methods section, is the skew of the survey sample collected from Amazon Mechanical Turk. This recruitment method is very efficient (400 participants could be recruited to participate in less than 24 hours) but it is more male and much more educated, on the whole, than the overall population of the United States and Canada. Sampling skew is difficult to control for in human subject research and is evident in many other recent COVID-19-related studies, but certainly having a greater representation of less-educated individuals and women may provide greater reliability to the findings. A future study may recruit participants from the general population, though this would undoubtedly require much greater time

investment. An additional limitation of this study lies in some of the question wordings and language differences, where some of the wordings could have been perceived as vague. For instance, it is possible (but perhaps not probable) that the statement "The COVID-19 vaccination comes with serious health risks" could be interpreted to mean not getting the COVID-19 vaccination increases one's serious health risks. This possible ambiguity could have been mitigated by simply restating the question to something like, "Getting the COVID-19 vaccination can cause serious health risks." Another limitation is that only a single question was used to represent each dependent variable (COVID Skepticism and Difficulty Finding Information). Finally, a significant portion of Canadians speak French and Americans speak Spanish as a primary language and this study offered no French or Spanish version of the survey, which may mean that these population are not adequately represented. Further research of these populations may provide additional insight.

Conclusion

This study has identified several factors that may contribute to elevated information gaps about the COVID-19 pandemic and increased skepticism about the effectiveness of COVID-19 prevention measures. These gaps and skepticism are, surprisingly, not correlated with one another, but are modulated by such factors as gender, political leaning, marital status, and family closeness and influence on information behavior. These identified factors may prove helpful in targeting certain populations for information and vaccination campaigns and, at minimum, give researchers an idea of what factors may contribute to medical information needs and vaccine hesitancy in future situations.

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References

- Akoglu, Haldun. 2018. "User's Guide to Correlation Coefficients." *Turkish Journal of Emergency Medicine* 18 (3): 91-93. <https://doi.org/10.1016/j.tjem.2018.08.001>.
- Al-Mohaithef, Mohammed and Bijaya Padhi. 2020. "Determinants of COVID-19 Vaccine Acceptance in Saudi Arabia." *Journal of Multidisciplinary Healthcare* 13: 1657-1663. <https://doi.org/10.2147/JMDH.S276771>.

- Bonanad, Clara, Sergio Garcia-Blas, Francisco Tarazona-Santabalbina, Juan Sanchis, Vicente Bertomeu-Gonzalez, Lorenzo Facila, Albera Ariza, Julio Nunez, and Alberto Cordero. 2020. "The Effect of Age on Mortality in Patients With COVID-19: A Meta-Analysis With 611,583 Subjects." *JAMDA The Journal of Post-Acute and Long-Term Care Medicine* 21 (7): 915-918. <https://doi.org/10.1016/j.jamda.2020.05.045>.
- Boyd, Kenneth. 2021. "Beyond Politics: Additional Factors Underlying Skepticism of a COVID-19 Vaccine." *History and Philosophy of the Life Sciences* 43 (1): 1-4.
- Chatman, Elfreda. 1992. *The Information World of Retired Women*. Westport, CT: Greenwood Publishing Group.
- Chen, Musha, Yanjun Li, Jiaoshan Chen, Ziyu Wen, Fengling Feng, Huachun Zou, Ling Chen, Yuelong Shu, and Caijun Sun. 2021. "An Online Survey of the Attitude and Willingness of Chinese Adults to Receive COVID-19 Vaccination." *Human Vaccines and Immunotherapies* 17 (7): 2279-2288. <https://doi.org/10.1080/21645515.2020.1853449>.
- Chen, Ying, Rui Zhou, Boyan Chen, Hao Chen, Ying Li, Zhi Chen, Haihong Zhu, and Hongmei Wang. 2020. "Knowledge, Perceived Beliefs, and Preventive Behaviors Related to COVID-19 Among Chinese Older Adults: Cross-sectional Web-based Survey." *Journal of Medical Internet Research* 22 (12): e23729. <https://doi.org/10.2196/23729>.
- Choma, Becky, Gordon Hodson, David Sumantry, Yaniv Hanoch, and Michaela Gummerum. 2021. "Ideological and Psychological Predictors of COVID-19-related Collective Action, Opinions, and Health Compliance Across Three Nations." *Journal of Social and Political Psychology* 9 (1): 123-143. <https://doi.org/10.5964/jspp.5585>.
- Chu, Li, Helene Fung, Dwight Tse, Vivian Tsang, Hanyu Zhang, and Chunyan Mai. 2021. "Obtaining Information from Different Sources Matters During the COVID-19 Pandemic." *The Gerontologist* 61 (2): 187-195. <https://doi.org/10.1093/geront/gnaa222>.
- Dalmer, Nicole and Meridith Griffin. 2021. "'We're Still Open': Canadian News Media's Framing of Canadian Public Libraries' COVID-19 Responses." *Proceedings of the Annual Conference of CAIS/Actes du congrès annuel de l'ACSI*. <https://doi.org/10.29173/cais1208>.
- El Skarpa, Paraskevi and Emmanouel Garoufallou. 2021. "Information Seeking Behavior and COVID-19 Pandemic: A Snapshot of Young, Middle Aged and Senior Individuals in Greece." *International Journal of Medical Informatics* 150 (June 2021): article 104465. <https://doi.org/10.1016/j.ijmedinf.2021.104465>.
- Evans, John H. and Eszter Hargittai. 2020. "Who Doesn't Trust Fauci? The Public's Belief in the Expertise and Shared Values of Scientists in the COVID-19 Pandemic." *Socius* 6: 1-13. <https://doi.org/10.1177/2378023120947337>.
- Hamutoglu, Nazire and Ugur Basarmak. 2020. "External and Internal Barriers in Technology Integration: A Structural Regression Analysis." *Journal of Information Technology Education* 19: 17-40. <https://doi.org/10.28945/4497>.

- Intahchomphoo, Channarong and Michelle Brown. 2021. "Canadian University Research Libraries During the Early Days of the COVID-19 Pandemic." *The Canadian Journal of Information and Library Science* 44 (1): 70-81. <https://doi.org/10.5206/cjilsrscib.v44i1.10910>.
- Lazarus, Jeffrey, Scott Ratzan, Adam Palayew, Lawrence Gostin, Heidi Larson, Kenneth Rabin, Spencer Kimball, and Ayman El-Mohandes. 2020. "A Global Survey of Potential Acceptance of COVID-19 Vaccine." *Nature Medicine* 27: 225-228. <https://doi.org/10.1038/s41591-020-1124-9>.
- Leibovitz, Talia, Amanda Shamblaw, Rachel Rumas, and Michael Best. 2021. "COVID-19 Conspiracy Beliefs: Relations with Anxiety, Quality of Life, and Schemas." *Personality and Individual Differences* 175 (June): article 110704. <https://doi.org/10.1016/j.paid.2021.110704>.
- Lenstra, Noah, Fatih Oguz, Joseph Winberry, and Lindsey Wilson. 2021. "Supporting Social Connectedness of Older Adults During the COVID-19 Pandemic: The Role of Small and Rural Public Libraries." *Public Library Quarterly*. <https://doi.org/10.1080/01616846.2021.1970446>.
- Levay, Kevin E., Jeremy Freese, and James N. Druckman. 2016. "The Demographic and Political Composition of Mechanical Turk Samples." *SAGE Open*. <https://doi.org/10.1177/2158244016636433>.
- Marcial, Laura H. and Bradley M. Hemminger. 2010. "Scientific Data Repositories on the Web: An Initial Survey." *Journal of the Association for Information Science and Technology* 61 (10): 2029-2048. <https://doi.org/10.1002/asi.21339>.
- Menard, Carolyne. 2021. "Challenges and Opportunities for Parliamentary Libraries During COVID-19: A Case Study of the National Assembly of Quebec Library." *IFLA Journal*. <https://doi.org/10.1177/03400352211023079>.
- Miller, Joanne M. 2020. "Psychological, Political, and Situational Factors Combine to Boost COVID-19 Conspiracy Theory Beliefs." *Canadian Journal of Political Science* 53: 327-334. <https://doi.org/10.1017/S000842392000058X>.
- Motta, Matthew. 2021. "Republicans, Not Democrats, Are More Likely to Endorse Anti-Vaccine Misinformation." *American Politics Research* 49 (5): 428-38. <https://doi.org/10.1177/1532673X211022639>.
- Ng, Eve. 2020. "Unmasking Masculinity: Considering Gender, Science, and Nation in Responses to COVID-19." *Feminist Studies* 46 (3): 694-703. <https://doi.org/10.15767/feministstudies.46.3.0694>.
- Osama, Tasnime, Bharat Pankhania, and Azeem Majeed. 2020. "Protecting Older People from COVID-19: Should the United Kingdom Start at Age 60?" *Journal of the Royal Society of Medicine* 113 (5): 169-170. <https://doi.org/10.1177/0141076820921107>.
- Pálsdóttir, Agusta. 2012. "Elderly Peoples' Information Behavior: Accepting Support from Relatives." *Libri* 62 (2): 135-144. <https://doi.org/10.1515/libri-2012-0010>
- Pennycook, Gordon, Jonathon McPhetres, Bence Bago, and David Rand. 2021. "Beliefs About COVID-19 in Canada, the United Kingdom, and the United States: A Novel Test of Political Polarization and Motivated Reasoning." *Personality and Social Psychology Bulletin* (June). <https://doi.org/10.1177/01461672211023652>.

- Pickup, Mark, Dominik Stecula, and Clifton van der Linden. 2020. "Novel Coronavirus, Old Partisanship: COVID-19 Attitudes and Behaviors in the United States and Canada." *Canadian Journal of Political Science* 53 (2): 357-364. <https://doi.org/10.1017/S0008423920000463>.
- Qu, Chen, Liu Yang, W. Bruce Croft, Johanne R. Trippas, Yongfeng Zhang, and Minghui Qiu. 2018. "Analyzing and Characterizing User Intent in Information-seeking Conversations." *International ACM SIGIR Conference on Research and Development in Information Retrieval* 41: 989-992. <https://doi.org/10.1145/3209978.3210124>.
- Romer, Daniel and Kathleen Jamieson. 2021. "Patterns of Media Use, Strength of Belief in COVID-19 Conspiracy Theories, and the Prevention of COVID-19 from March to June 2020 in the United States." *Journal of Medical Internet Research* 23 (4): e25215. <https://doi.org/10.2196/25215>.
- Rubin, Victoria L. 2011. "On Deception and Deception Detection: Content Analysis of Computer-mediated Stated Beliefs." *Proceedings of the American Society for Information Science and Technology* 47: 1-10. <https://doi.org/10.1002/meet.14504701124>.
- Taylor, Steven, Caeleigh Landry, Michelle Paluszek, and Gordon Asmundson. 2020. "Reactions to COVID-19: Differential Predictors of Distress, Avoidance, and Disregard for Social Distancing." *Journal of Affective Disorders* 277 (December): 94-98. <https://doi.org/10.1016/j.jad.2020.08.002>.
- Verma, Shankey and Aditi Mishra. 2020. "Depression, Anxiety and Stress and Socio-demographic Correlated Among General Indian Public During COVID-19." *International Journal of Social Psychiatry* 66 (8): 756-762. <https://doi.org/10.1177/0020764020934508>.
- Wang, Donna, Kathryn Krase, Annette Clarke-Jones, Joyce Roberson-Steele, and Karen Clark-Hoey. 2021. "Comparing Macro Influences on Individuals' Initial Coping and Response to COVID-19 in Canada and USA." *Journal of Human Rights Social Work* 6: 246-254. <https://doi.org/10.1007/s41134-021-00176-y>.
- Wang, Jiahao, Rize Jing, Xiaozhen Lai, Haijun Zhang, Yun Lyu, Maria Knoll, and Hai Fang. 2020. "Acceptance of COVID-19 Vaccination During the COVID-19 Pandemic in China." *Vaccines* 8 (3): article 482. <https://doi.org/10.3390/vaccines8030482>.
- Wang, Ting and Brady Lund. "Announcement Information Provided by United States' Public Libraries During the 2020 COVID-19 Pandemic." *Public Library Quarterly* 39 (4): 283-294. <https://doi.org/10.1080/01616846.2020.1764325>.
- Wang, Yiwei and Chirag Shah. 2016. "Exploring Support for the Unconquerable Barriers in Information Seeking." *Proceedings of the Association for Information Science and Technology* 53: 1-5. <https://doi.org/10.1002/pra2.2016.14505301106>
- Wicks, Don. 2004. "Older Adults and Their Information Seeking." *Behavioral and Social Sciences Librarian* 22 (2): 1-26. https://doi.org/10.1300/J103v22n02_01.
- Williamson, Kirsty. 1998. "Discovered by Chance: The Role of Incidental Information Acquisition in an Ecological Model of Information Use." *Library and Information*

Science Research 20 (1): 23-40.

[https://doi.org/10.1016/S0740-8188\(98\)90004-4](https://doi.org/10.1016/S0740-8188(98)90004-4).

Zhao, Xiaoman, Ju Fan, Iccha Basnyat, and Baijing Hu. 2020. "Online Health Information Seeking Using '#COVID-19 Patient Seeking Help' on Weibo in Wuhan, China." *Journal of Medical Internet Research* 22 (10): e22910. <https://doi.org/10.2196/22910>.

Appendix A: Survey Instrument

1. What is your gender identity?
 - a. Male
 - b. Female
 - c. Nonbinary
2. What is your age group?
 - a. 60-70
 - b. 71-80
 - c. 81+
3. What is your highest level of academic achievement?
 - a. Less than High School Graduate
 - b. High School Graduate
 - c. Undergraduate Degree
 - d. Graduate or Professional Degree
 - e. Doctoral Degree
4. Which best describes your political affiliation?
 - a. Very Liberal
 - b. Liberal
 - c. Neutral
 - d. Conservative
 - e. Very Conservative
5. How close are you with your family?
 - a. Very Close
 - b. Close
 - c. Somewhat Close
 - d. Not Very Close
 - e. Not At All Close
6. What is your relationship status?
 - a. Single
 - b. In a relationship (not married)
 - c. Married
 - d. Widowed
7. My family influences my life choices, what information I choose to consume (what shows you watch, what you read online), and personal health choices
 - a. Strongly Agree
 - b. Agree
 - c. Somewhat Agree
 - d. Agree Very Little
 - e. Agree Not At All
8. Media coverage of the COVID-19 Pandemic has been overblown.
 - a. Strongly Agree
 - b. Agree
 - c. Somewhat Agree
 - d. Agree Very Little

- e. Agree Not At All
- 9. The COVID-19 vaccination comes with serious health risks.
 - a. Strongly Agree
 - b. Agree
 - c. Somewhat Agree
 - d. Agree Very Little
 - e. Agree Not At All
- 10. It is difficult to find reliable information about COVID-19.
 - a. Strongly Agree
 - b. Agree
 - c. Somewhat Agree
 - d. Agree Very Little
 - e. Agree Not At All
- 11. It is/was possible to control the spread of COVID-19 through measures like social distancing, mask wearing, and practicing good hygiene.
 - a. Strongly Agree
 - b. Agree
 - c. Somewhat Agree
 - d. Agree Very Little
 - e. Agree Not At All