Paying Attention to the Pandemic: Knowledge of COVID-19 by News Sources and Demographics (Tentative Title) *

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Abstract

Never before has so much information been so immediately accessible to so many. Yet the challenges in sorting through this information are perhaps greater than ever. Previous research has looked at the role of social media and other news sources on shaping the U.S. population's understanding of the COVID-19 pandemic. However, what has not been studied is how this knowledge acquisition is structured by the demographic characteristics of gender, race and ethnicity, and income. Furthermore, how does uncertainty about this knowledge also differ by demographic group membership? This study reveals how the use of different news sources differentially shape access to accurate information about COVID-19 and related topics for different demographics. I answer these questions by analyzing recent Pew Research survey data asking respondents about their news media consumption and their knowledge of COVID-19 science and related current events information. I determine the effect of demographic group memberships in shaping (mis)information and (un)certainty about COVID-19 received through news sources.

Methods

In this analysis, I investigate factual knowledge and certainty using the Pew Pathways June 2020 American Trends Panel Wave 68 Survey. The survey features four questions of particular interest, which ask about factual knowledge about the COVID-19 pandemic and the economy during this time:

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(1) "Is the national unemployment rate as reported by the government currently..." (Correct answer is 15%)

(2) "As far as you know, are antibody tests for the coronavirus (also known as serology tests) intended to detect..." (Correct answer is "A previous infection")

(3) "Do you happen to know who Anthony Fauci is?" (Correct answer is "An infectious disease expert and government health adviser.")

(4) "As far as you know, how did states in the U.S. respond during the coronavirus outbreak?" (Correct answer is "Some states in the U.S. have not had a statewide stay-at-home order.")

Model

I use a two-step model to analyze the levels of uncertain and correct answers for the three factual knowledge question in this study (Figure 1).

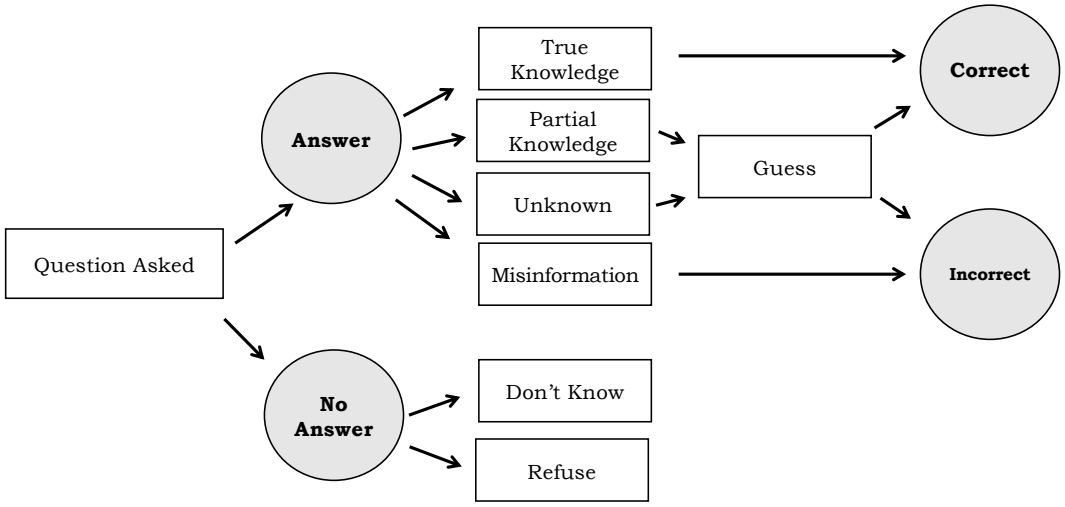

Figure 1: *A model of responses to knowledge questions.* My analytical approach conceives of respondents following a two-step decision process when answering factual knowledge questions in surveys. First, the respondent decides if they are sufficiently certain to answer the question or not (a measure of collective certainty when aggregated). Others answer the question either 'don't know' or some variation thereof. Conditional on answering, the respondent proceeds to step two, either getting the question correct or incorrect (a measure of misinformation).

I separate my model of knowledge into two steps (see Figure 1). First, I analyze the

proportion of respondents who are uncertain about each factual knowledge question by domain. To do this, I estimate the weighted population mean for the response of 'don't know' (or similar answers such as 'not sure,' 'no opinion,' 'prefer not to say,' and 'don't know / refused') for each knowledge question where such an answer was available to the respondent:

$$mean_{DK} = \frac{P(y = 1)}{N}.$$

In this model, *y = 1* is the outcome variable ('don't know' answer), and N is the size of the dataset. The mean value 'don't know' for the population for a single knowledge question ($mean_DK$) is equal to the survey-weighted probability of the respondent answering 'don't know' (or a variant) divided by the total number of survey respondents who were asked the question. Respondents who refused to answer are excluded from the analysis.

Second, I analyze the proportion of the population (out of those providing an answer related to the substance of the question) who answered correctly and incorrectly. To do this, I estimate the population mean (and standard error) for the binary variable indicating correct answer:

$$mean_C = \frac{P(y = 1)}{N}.$$

In this model, N is the size of the dataset, and *y = 1* the outcome variable (correct answer). The probability of answering correctly ($P(y = 1)$) is calculated out of all individuals who provided a correct or incorrect answer and those who respond 'don't know'. Respondents who refused to answer are excluded from the analysis. Hence, the mean value correct for the population for a single knowledge question ($mean_C$) is equal to the survey-weighted probability of the respondent getting the knowledge question correct divided by the total number of survey respondents.

Preliminary Results

Preliminary regression results find that both news source and demographic identity are significant predictors of whether or not people answer questions related to COVID-19 and the pandemic economy correctly. Preliminary results showing odds ratios for each of these factors predicting correct knowledge of four knowledge questions are presented in Table 1. Race has the most consistent and dramatic effect on correct knowledge about antibody tests, even controlling for income and news source. In contrast, news source and income seem to have the most influence on whether respondents knew that Anthony Fauci is an infectious

disease expert and government advisor. Income, predictably, had the most influence on whether someone answered the question about the national unemployment rate correctly – although race was also a good predictor of knowing this fact.

Additional analyses carried out for the full paper will look at interactions of race and news source and of income and news source to see if different groups get different factual knowledge outcomes from consuming different news sources. Analyses will also investigate the role of gender, race and ethnicity, income, and education, in order to explore the role of intersectional identities (to the degree possible allowed by statistical power) on news consumption during the pandemic and knowledge of these questions. Additionally, in the full paper, I will transform categorical income into continuous income in order to make the coefficients more interpretable.

Preliminary Discussion

This paper will describe a snapshot of COVID-19 and current events knowledge in the U.S. as a function of demographic characteristics and news consumption. This makes it a contribution in the style of Mannheim's sociology of knowledge (Mannheim 1936; Swidler and Arditi 1994) and the study of demographic inequalities in gender, class, and race and ethnicity. These are all important implications of knowledge inequality and important reasons compelling its relevance to scholars of inequality and policy-makers. Misinformation is an important emerging topic in information science and sociology (Metaxa-Kakavouli and Torres-Echeverry 2017). In essence, this is a study of modern epistemology. How do we come to know what we know? How do we come to be misinformed? If our news media and other sources of factual information are pushing users in biased ways and ways that depend on the demographics of the user, then we cannot be assured that this information is reliable. Understanding how this differs by demographic variables has important implications for social research and policy.

Table 1: *Predicting COVID Knowledge: Logistic Regressions Estimating Correct COVID Knowledge Conditional on Demographic and Media Predictors. Odds ratios (and linearized standard errors) for each knowledge question.*

Variable	Anthony Fauci is an infectious disease expert & govt. adviser	Antibody tests detect previous coronavirus infections	Unemployment rate around 15% in June	Some states had no stay-at-home order
News Source (Comparison: International news outlets)				
National news outlets	1.66 (0.31)***	1.68 (0.25)**	1.22 (0.16)	1.38 (0.19)*
Local news outlets	0.45 (0.08)***	0.69 (0.11)*	0.69 (0.10)*	0.80 (0.11)
Trump or coronavirus task force	0.86 (0.17)	0.96 (0.15)	0.91 (0.13)	1.11 (0.16)
Biden campaign	0.10 (0.08)***	0.27 (0.17)*	0.36 (0.28)	0.81 (0.60)
State and local elected officials	0.92 (0.19)	1.41 (0.24)*	0.75 (0.11)	1.17 (0.18)
Public health orgs. & officials	0.77 (0.14)	1.36 (0.21)*	0.89 (0.12)	1.19
Friends, family & neighbors	0.13 (0.03)***	0.39 (0.09)***	0.35 (0.08)***	0.48 (0.10)***
Community or neighborhood news	0.14 (0.06)***	0.44 (0.20)	0.80 (0.39)	0.70 (0.36)
Online forums or discussion groups	0.41 (0.10)***	0.80 (0.17)	0.60 (0.13)*	1.09 (0.23)
Race (comparison: White)				
Black	0.46 (0.05)***	0.29 (0.03)***	0.74 (0.08)**	0.52 (0.05)***
Asian	0.82 (0.18)	0.44 (0.08)***	0.93 (0.14)	0.81 (0.13)
Hispanic	0.50 (0.04)***	0.44 (0.03)***	0.72 (0.05)***	0.62 (0.04)***
Other/Mixed	0.55 (0.10)**	0.58 (0.09)**	0.66 (0.10)**	0.73 (0.11)*
Income (comparison: $0 to $10,000)				
$10,000 to $20,000	1.35 (0.24)	1.30 (0.22)	1.06 (0.19)	1.06 (0.17)
$20,000 to $30,000	1.83 (0.31)***	1.98 (0.32)***	1.52 (0.27)*	1.17 (0.18)
$30,000 to $40,000	2.12 (0.36)***	2.19 (0.36)***	2.16 (0.27)***	1.31 (0.21)
$40,000 to $50,000	2.84 (0.48)***	2.48 (0.40)***	1.76 (0.30)**	1.40 (0.21)*
$50,000 to $75,000	4.21 (0.66)***	3.24 (0.49)***	2.45 (0.39)***	2.00 (0.28)***
$75,000 to $100,000	5.79 (0.98)***	4.83 (0.75)***	2.72 (0.43)***	2.00 (0.29)***
$100,000 to $150,000	7.51 (1.31)***	5.97 (0.94)***	2.96 (0.47)***	2.23 (0.32)***
$150,000 and above	10.57 (2.12)***	8.92 (1.52)***	4.08 (0.66)***	2.20 (0.32)**
N	9173	9173	9173	9173

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