International Journal of Communication 18(2024), 1028–1048 1932–8036/20240005

Network Informational Complexity, Epistemic Political Efficacy, and Fact-Checking

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This study used three surveys to assess the role of information network complexity in the use of fact-checking tools. The overarching contention was that those exposed to conflicting political information (i.e., are part of informationally complex discussion networks) are more likely to access fact-checking websites. The rationale underlying this prediction was that exposure to conflicting information produces epistemic uncertainty, which, for some, can be addressed via the use of fact-checking websites. It was further suggested that those high in epistemic political efficacy (EPE) might be especially inclined to use fact-checking websites. The results indicated that those with complex online information networks were more likely to report engaging with fact-checking tools. Therein, the data suggested that EPE was positively related to fact-checking tool use but did not condition the relationship between online network complexity and involvement with fact-checks. Further analyses indicated that fact-checking consumption is positively associated with fact-check sharing.

Keywords: fact-checking, communication networks, epistemic political efficacy, survey

Fact-checking tools have come to occupy an increasingly prominent space in the media ecosystem (e.g., Amazeen, 2019; Graves, Nyhan, & Reifler, 2016). Setting aside broad philosophical questions related to the oft-slippery nature of the "facts" and who gets to own them (e.g., Uscinski & Butler, 2013), fact-checks have at least some potential to serve as an epistemic counterbalance to false, misleading, and/or distorted hyperpartisan claims (e.g., Amazeen, 2015). Despite this potential, there exist substantial concerns over the degree to which the public is aware of fact-checking tools, the extent to which the public trusts fact-checking tools, and the extent to which the public uses fact-checking tools (e.g., Brandtzaeg & Følstad, 2017). In light of such questions, researchers have increasingly sought to better understand the individual, platform, and issue-related factors that are associated with fact-checking engagement in hopes of better understanding the scenarios in which fact-checks are and are not effective correctors of mis-and-disinformation. This work has indicated that those who use fact-checking tools tend to be younger, ideologically liberal, and frequent news consumers (e.g., Lyons, Mérola, Reifler, & Stoeckel, 2020; Robertson, Mourão, & Thorson, 2020).

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Date submitted: 2022-06-29

One potentially important area that the contemporary literature on fact-checking has not assessed pertains to the relationship between communication network information characteristics (e.g., McLeod et al., 1999) and the use of fact-checks. Information-seeking behaviors, be they on the Internet or in one's analog life, are impacted by any number of social factors. As such, it seems plausible that the attributes of one's communication network(s) should have meaningful implications on their decision to engage with fact-checks. This work focuses specifically on the concept of *network informational complexity*, or the extent to which an individual's communication network contains conflicting political information. Networks featuring conflicting political information are inherently more complex as they push evaluators to assume comparatively intensive cognitive and behavioral sensemaking strategies (e.g., Song, 2014). This work posits that information coming from complex networks supports feelings of epistemic uncertainty (or, "uncertainty about the validity of truth claims"; Peters & Dunwoody, 2016, p. 894). Such uncertainty, in turn, is likely to make fact-checking tools increasingly attractive, as they theoretically allow for the reduction of incurred uncertainty. Moreover, and in line with prior work on individual factors, this work suggests that those with high levels of *epistemic political efficacy* (EPE; confidence in one's ability to accurately analyze political truth claims; Pingree, 2011) are perhaps best positioned to take advantage of the uncertainty-reducing potentials of fact-checks.

Literature Review

Fact-Checking

Contemporary handlings of "fact-checking" typically refer to the use of digital tools designed to help citizens adjudicate factual claims encountered in the course of political discussion or engagement (Amazeen, Vargo, & Hopp, 2019). Although some fact-checking tools employ artificial intelligence (e.g., Logically.AI) or crowdsourced (e.g., Twitter's *Birdwatch*) approaches, the most popular fact-checking platforms (e.g., Snopes, FactCheck.org, PolitiFact) are manually generated in general accordance with the normative practices that govern the production of objective journalism (e.g., Graves, 2017; Graves & Amazeen, 2019). Moreover, legacy news outlets such as *The Washington Post* frequently issue fact-checks.

Despite an enhanced presence in the contemporary public discourse, evidence shows that fact-checking tools are not a central part of most people's information repertoires (e.g., Robertson et al., 2020). The reasons for these low levels of regular fact-checking engagement vary but are typically linked to demographic elements, partisan factors, or political interest deficits (e.g., Robertson et al., 2020). In short, the epistemic benefits of fact-checking tools generally are presented in theoretical rather than observable terms.

That being said, substantial portions of the American population report at least occasionally using fact-checking tools (e.g., Pew Research Center, 2020), and research has shown that even brief exposure to external factual adjudication can change political misperception (e.g., Nyhan, Porter, Reifler, & Wood, 2017; Walter, Cohen, Holbert, & Morag, 2020; York et al., 2020). To better understand the *whys* and *why nots* of fact-checking involvement and efficacy, scholarship has typically sought to examine how individual attributes are related to involvement variables such as awareness, attitudes, usage, and processing (Amazeen et al., 2019; Robertson et al., 2020; Walter et al., 2020). Although such investigation is obviously important, it

stands to reason that contextual information network factors may also play a role in evaluative involvement with fact-checks.

Network Informational Complexity

In the communication sciences, one typical approach to conceptualizing network informational complexity has been to argue that the presence of social and/or political heterogeneity in a given communication network results in exposure to diverse information (e.g., Eveland & Hively, 2009; Hopp, Ferrucci, Vargo, & Fisher, 2020; McLeod, Sotirovic, & Holbert, 1998). Notably, the broader notion of discussion network heterogeneity has a somewhat fraught definitional history. As Eveland and Hively (2009) point out, the political communication literature has used the heterogeneity frame to refer to a wide array of distinct but overlapping discussion factors, including differences between an ego and their alters (e.g., Eveland & Hively, 2009; Hopp et al., 2020) and differences among the various alters that together exist within a communication network (e.g., McLeod et al., 1999) or the extent to which bonded or bridged social ties are apparent in the network (e.g., Quintelier, Stolle, & Harell, 2012). This study focuses on the extent to which an individual is exposed to a diversity of conflicting or otherwise nonideologically aligned actors and political beliefs, as, according to Lee, Choi, Kim, and Kim (2014), such patterns of exposure are increasingly consequential in a world in which social media platforms have become a central means of political information acquisition. Although this construct has previously been referred to as *discussion network heterogeneity* (e.g., Brundidge, 2010; Lee et al., 2014; Scheufele, Hardy, Brossard, Waismel-Manor, & Nisbet, 2006), the present work's adoption and application of the term *network informational complexity* are an attempt to draw upon the advice of Eveland and Hively (2009) to use precise definitional frames when appraising discussion network heterogeneity factors.

The present work assumes that a communication network composed of various types of alters will naturally be inclined to produce information that is internally inconsistent. Such conceptualization of complexity reflects typical constitutive definitions of the word, which characteristically emphasize the interconnection of difference. For instance, the Oxford English Dictionary (n.d.) defines *complex* as "consisting of parts or elements not simply co-ordinated." This approach to network informational complexity is, therefore, specifically concerned with the extent to which a network collectively produces informational texts (e.g., user comments, hyperlinks to news stories) that are inconsistent with one another. Notably, when bits of information do not neatly align with one another, navigation of the information environment requires the application of enhanced user-level sensemaking and factual adjudication strategies. These strategies, as discussed below, take on different forms, but all centrally deal with the ego's approach to handling epistemic uncertainty.

Epistemic Uncertainty

In the context of the news media, epistemic uncertainty pertains to situations and scenarios in which an actor experiences uncertainty when exposed to external claims about the nature of reality (van der Bles, van der Linden, Freeman, & Spiegelhalter, 2020; Peters & Dunwoody, 2016). Feelings of uncertainty are a natural human response when exposed to conflicting information. According to Hendriks and Jucks (2020), epistemic uncertainty pertains to scenarios in which uncertainty is—theoretically speaking—resolvable. In other words, epistemic uncertainty refers to situations in which the considered

issue is not of an inherently unsolvable character (e.g., *What happens to us after we die?*), but, instead, can be addressed with some truth-level approximation (e.g., *What are the drivers of domestic inflation?*).

On the individual level, evidence suggests that habitation with epistemic uncertainty is less than desirable (e.g., Kruglanski, 1989). Theories of interpersonal interaction (e.g., Berger & Calabrese, 1975), for example, suggest that uncertainty results in diminished feelings of control, a lack of self-confidence, and confusion as to what to expect from one's surroundings (Kozman, Tabbara, & Melki, 2021). A normal human response when faced with uncertainty is to engage with cognitive, information seeking, or relational behaviors with state-reductive potentialities (e.g., Kellerman & Reynolds, 1990).

The seemingly straightforward theoretical prediction that uncertainty motivates information consumption has, however, received mixed empirical support (Affifi & Weiner, 2004; Kellerman & Reynolds, 1990; Kozman et al., 2021; Kuang & Wilson, 2017). One reason for this lack of effect-related consistency may be because what Affifi and Weiner (2004) describe as a lack of scholarly attendance to so-called "scope conditions." Specifically, approaches postulating a positive relationship between uncertainty states and motivated information seeking have, perhaps mistakenly, assumed theoretical "applicability across diverse contexts" (Affifi & Weinder, 2004, p. 168). Social contexts, communication channels, discussion topics, and other communication process-related variables all have the potential to shape the relationship between uncertainty states and information-seeking behaviors and may, as such, necessitate the need for specialized theorizing. Another factor that may explain the lack of consistency related to uncertainty states and information seeking may relate to the literature's failure to attend to context-specific forms of self-efficacy. On this point, Affifi and Weiner (2004) noted that while there is broad acceptance that self-efficacy is a critical factor in almost all areas of human thought and behavior, it appears in a very small number of theoretical or empirical accounts seeking to explain motivated information-seeking behaviors.

Regarding scope conditions, this study suggests that exposure to complex political information environments is likely to produce epistemic uncertainty. In heterogeneous conditions, political information networks take on a multifaceted nature, effectively requiring participants to process communicator, informational, and modality attributes to assess truth claims. In many cases, these attributes can come in conflict with one another. For instance, consider a Facebook-based discussion between an actor and a close family member. In this hypothetical interaction, the family member makes a truth claim of dubious veracity. Furthermore, this claim is substantiated using a hyperlink to an external information source that is unfamiliar to the actor. In this interaction, any number of tensions arise. On the one hand, the truth claim is put forward by a significant other with whom meaningful material, emotional, and trust resources may be shared. On the other hand, the content of the truth claim runs against the ego's immediate instincts and, therein, employs an unknown source for the purposes of substantiation. Taken as a whole, these factors combine to produce epistemic uncertainty that can be relived in one of three ways: (1) The actor can simply maintain already-held beliefs or assumptions; (2) the actor can accept the family member's truth claim as valid; or (3) the actor can use external knowledge sources (e.g., fact-checks) to adjudicate the truth claim. The intent of this work is not to claim that the first and second outcomes do not or cannot occur (they undoubtedly frequently do), but, instead, that the nature of complex information networks—perhaps especially in digital contexts—increases the likelihood of epistemic uncertainty being addressed via fact-checking.

Epistemic Political Efficacy

Given the importance of self-efficacy factors in motivated information consumption (Affifi & Weiner, 2004), this work suggests that those high in EPE will be *best equipped* to take advantage of the uncertainty-reducing potential of fact-checking tools. According to Pingree (2011), EPE can be defined as "confidence in one's own ability to determine the truth about factual political disputes" (p. 25). The EPE concept is derived from Bandura's (e.g., 1982) general theory of self-efficacy, which holds that cognitive appraisals about self-capability play a critical role in behavioral decision making. In short, self-efficacy theory suggests that people have a marked tendency to avoid engaging in behaviors in which they believe they have little probability of successful execution (Bandura, 1982). In the context of fact-checking, it stands to reason that those who believe that they can accurately adjudicate political claims will be inclined to see the value of modern fact-checking tools and, therefore, be more likely to use these tools to arrive at judgments about the true state of reality. From the standpoint of empirical specification, the proposition here is one of synergy (e.g., Cohen, Cohen, West, & Aiken, 2003). When faced with complex political information environments, people will generally lean toward the use of fact-checking tools. Those with high levels of EPE will be *especially prone* to such behavior, as they are comparatively well-equipped with the cognitive resources underlying the effective use of fact-checking tools.

Offline Versus Online Discussion Contexts

Despite the mainstream press' predigital positioning as the element of the public sphere most specifically entrusted with adjudicating political and social truth claims, fact-checking is perhaps most typically understood by researchers, journalists, and the public as an online phenomenon (e.g., Brandtzaeg, Følstad, & Domínguez, 2018; Rich, Milden, & Wagner, 2020; Walter et al., 2020). Such perception undoubtedly stems from the fact that information explicitly labeled as "fact-checked" is hosted on the Internet by digital publishers and fact-check platforms and actors are typically motivated by social media–based mis- and disinformation. In contrast to offline discussion, social and digital media affordances related to accessibility, traversability, hypertextuality, and convenience (e.g., Brundidge, 2010; Conole & Dyke, 2004; Eveland, Marton, & Seo, 2004) mean that truth claims proffered in digital communication contexts can be readily and straightforwardly subjected to fact-checking. Moreover, disinformation and other low-quality political claims are most likely to be encountered when using social media and other online platforms.

Consuming and Sharing Fact-Checks

In a contemporary informational ecosystem increasingly marked by peer-to-peer transfer of information, the ultimate success of fact-checks depends, in part, on whether social media users decide to share fact-checks with their digital networks (e.g., Amazeen et al., 2019). Prior work on the predictors of sharing fact-checks with one's digital networks (e.g., Robertson et al., 2020) suggests that the decision to share a fact-check might rest upon prior states of psychological engagement with fact-checking information (i.e., people are unlikely to share information that they are not predisposed to and have not consumed). This perspective conforms with a broader body of work on social media–based content sharing, which provides reason to believe that information consumption may be a typically necessary condition for eventual sharing (e.g., Fletcher & Park, 2017; Kümpel, Karnowksi, & Keyling, 2015).

Hypotheses and Research Question

Based on the foregoing literature, this work hypothesizes:

H1: *Exposure to complex information networks is likely to produce scenarios conducive to the use of fact-checking tools. The positive relationship between complex information network exposure and fact-check usage is likely to be especially apparent in situations in which EPE is high.*

H2: *Given the nature of contemporary social media platforms, it is further expected that the relational pattern identified in Hypothesis 1 will be primarily apparent in online/social media–based (rather than traditional/offline) discussion networks.*

H3: *In light of work suggesting that content consumption is a predictor of eventual sharing, the present study hypothesizes that fact-check consumption will predict fact-check sharing.*

Finally, while the relationship between fact-check consumption and fact-checking sharing is straightforward, the literature provides little information, as it pertains to the ways that network informational complexity and EPE might be related to fact-check sharing decisions.

RQ1: *What is the potential relationship between fact-check sharing and informational complexity and EPE?*

Study 1

Two original datasets were collected to explore the hypotheses and research question stimulating this research. The first data set was generated using Dynata (https://www.dynata.com/), a U.S.-based market research firm. This survey employed soft quotas on gender, age, and education in an attempt to ensure that the sample had approximately the same attributes as the American public. The survey was administered online. A total of 733 complete responses were obtained. A second data set was created from the population of Amazon Mechanical Turk (MTurk) workers. To ensure data quality, CloudResearch's (https://www.cloudresearch.com/) MTurk Toolkit was employed to protect against bots, inattentive participants, and other low engagement and/or fraudulent forms of participant involvement (Litman, Robinson, & Abberbock, 2017). A total of 1,095 complete responses were collected. The Dynata data were collected in November 2021, whereas the MTurk data were collected in August 2022. Information was drawn from two different data providers in an attempt to help ameliorate the effects of any unique biases associated with a given data service or respondent pool.

Measures

Dynata Data

Consistent with prior work (e.g., Robertson et al., 2020), a raw fact-check usage estimate was obtained by asking how frequently the respondent uses online fact-checking websites to determine if a claim is true or not (1 = very infrequently, 7 = very frequently). Respondents also provided information related to how frequently they share content from fact-checking websites (1 = very infrequently, 7 = very frequently). Online network informational complexity was measured using two items that asked people to

think about their political interactions on social media and indicate the degree to which they agreed or disagreed with the following statements: "The people I interact with on social media express a wide variety of opinions" and "The people I interact with on social media have a diversity of perspectives" (1 = strongly disagree, 7 = strongly agree). Offline network informational complexity was assessed by asking participants to think about their offline political interactions and assess the following statements: "The people I talk with express a wide variety of opinions" and "The people I talk with have a diversity of perspectives" (1 = strongly disagree, 7 = strongly agree). EPE was measured using Pingree's (2011) three-item scale: "If I wanted to, I could figure out the facts behind most political disputes." "I feel confident that I can find the truth about political issues." "There are objective facts behind most political disputes, and if you try hard enough you can find them." (1 = strongly disagree, 7 = strongly agree).

The survey instrument also assessed age (in years), sex (0 = male, 1 = female), race/ethnicity (1 = non-Hispanic White, 2 = non-Hispanic Black/African American, 3 = Hispanic/Latino, 4 = Asian/Asian American, 5 = American Indian/Native Alaskan/Hawaiian, 6 = other; recoded as 0 = non-White, 1 = White), educational attainment (1 = a high school degree or less, 5 = a master's degree or higher), and estimated annual income (1 = $0.00–$25,000, 7 = greater than $200,000). For political variables, ideology (1 = strongly conservative, 11 = strongly liberal) and political party identification (Democrat, Republican, independent, and other party member) were assessed. Political interest was assessed using a single item that asked respondents if they saw themselves as someone who pays close attention to current events (1 = strongly disagree, 7 = strongly agree). A composite measure of news consumption was created by asking respondents to indicate how frequently (1 = never, 7 = very frequently) they read the newspaper, tune into broadcast news, tune into cable news, see news information on social media, listen to the news on the radio, read news blogs, and search the Internet for the news. Social media usage intensity was addressed using a five-item composite measure that asked about the frequency with which the respondent uses Facebook, Twitter, Instagram, YouTube, and TikTok (1 = never, 7 = very frequently). Online political discussion frequency was measured using a single item that asked how often the respondent made political posts on social media (1 = never, 7 = very frequently). Offline political discussion frequency was assessed using a single item that asked how frequently the respondent discusses politics with friends, family members, and other people (1 = never, 7 = very frequently). Online network size was measured by asking the respondent to estimate how many social media–based connections they have (1 = 0–100, 13 = more than 5,000), whereas the respondent's offline political discussion network size was assessed by asking for an estimate of the number of different people the respondent talks about politics in a given year (0 = 0, 12 = more than 100).

MTurk Data

In the MTurk sample, fact-check consumption was measured using three items that were subsequently collapsed into a composite index: "How often do you use fact-checking websites to determine if a claim is true or not?" "How often do you use fact-checking websites to learn more about the world around you?" "How often do you use fact-checking websites to distinguish between biased partisan political claims and the truth of the matter?" Fact-check sharing was measured using three items, which were again collapsed into a single composite index: "How often do you share content from fact-checking websites with people you know online?" "How often do you share content from fact-checking websites on social media?" "How often do you share content from fact-checking websites via email?" Both the fact-checking

consumption and fact-check sharing measures on 7-point scale were 1 = very infrequently, 7 = very frequently. Online informational network complexity was assessed using seven items. Two of these items were identical to those used in the Dynata data, whereas five additional items asked respondents to assess the extent to which those they interact with on social media "present both/multiple sides of contemporary political issues" or "have very different views from one another"; the extent which the respondent "interacts with both Democrats and Republicans"; the extent to which fellow interactants provide "insight into a wide range of perspectives on contemporary political issues"; and the extent to which the respondent's "online network (or networks) is comprised of people who disagree with one another on topics related to politics." The offline network complexity measure also employed seven indicators. These items were identical to those constituting the online network complexity measure save the fact that the anchor phrase asked respondents to assess the questions in the context of offline political discussion. Response scaling for all network complexity indicators was 1 = strongly disagree, 7 = strongly agree.

The EPE, sociodemographic, political identity and interest, news consumption, social media usage, and online and offline political expression frequency were measured in a manner identical to that used in the Dynata sample. The online and offline discussion network size variables (respectively) asked respondents to estimate the number of different people they talk about politics in a given week (1 = 0, 22 = more than 20).

Sample Descriptions

Dynata Data

Approximately 54% of the sample indicated that they were female, and 76% of the sample indicated that they were White. The average age of the sample was 47.03 years (SD = 17.97). The median response on the income measure was between $50,001 and $75,000, whereas the median response on the education scale was a two-year degree. In terms of political identity, 32% of the sample indicated that they were a Republican, 37% indicated that they were a Democrat, and 31% indicated that they were an independent or member of another party. The mean score on the liberal ideology scale was 5.46 (SD = 2.98). The sample indicated moderate levels of political interest (M = 4.71, SD = 1.71). For the media variables, the mean scores on the social media intensity and news consumption measures were 3.56 (SD = 1.70, α = .78) and 3.64 (SD = 1.58, α = .87), respectively. The mean score for the online discussion frequency variable was 2.49 (SD = 1.93), whereas the mean value for the offline discussion frequency variable was 3.66 (SD = 1.97). The median online discussion network size was 101–200 connections, while the median value for the offline discussion network variable was 1–10 people. Finally, for the variables of core theoretical interest, the mean score on the online network informational complexity variable was 4.34 (SD = 1.71, r = .86), the mean score on the offline network informational complexity variable was 4.68 (SD = 1.39, r = .78), and the mean score on the EPE measure was 4.22 (SD = 1.59, α = .87). On the fact-check usage variable, the mean score on the fact-checking usage variable was 3.52 (SD = 2.05; median = 4), whereas the mean score on the fact-checking sharing variable was 3.04 (SD = 2.03; median = 3).

MTurk Data

In the MTurk sample, 51% was male and 78.4% of the sample was White. The average age was 36.72 (SD = 10.96). The sample-wide median annual income amount was $50,001–$75,000, while the median level of education was a four-year degree. In all, 28.2% of the sample identified as Republican, 62.9% identified as Democrat, and 8.9% classified themselves as independent or member of a third party. Mean scores on the liberal ideology and political interest scales were 7.23 (SD = 3.51) and 5.72 (SD = 1.30), respectively. Mean values for the media use and discussion variables were social media intensity = 5.43 (SD = 1.06, α = .77); news consumption = 5.25 (SD = 1.11, α = .87); offline discussion frequency = 5.28 (SD = 1.82); and online discussion frequency = 5.46 (SD = 2.00). For the network size variables, the offline network size median value was six people, and the online network size median value was seven people. The mean score on the online network informational complexity variable was 5.44 (SD = 0.92, α = .87), the mean score on the offline network informational complexity variable was 5.41 (SD = 0.87, α = .84), and the mean score on the EPE measure was 5.45 (SD = 1.01, α = .75). Finally, for the fact-checking variables, the mean score for fact-check usage variable was 5.19 (SD = 1.28, α = .83), whereas the mean score for the fact-check sharing variable was 5.14 (SD = 1.48, α = .88).

Analytic Strategy

Dynata Data

The core outcome variables were both ordinal frequency measures. As such, the data were modeled using ordinal logistic regression. Seven models were estimated. Model 1 assessed the nonconditional associations between network informational complexity, EPE, and the use of fact-checking tools. Models 2 and 3 tested if EPE moderated the relationship between online and offline network informational complexity and the use of fact-checking tools. This pattern was repeated for Models 3–6, which employed the fact-check sharing as the criterion variable. Finally, Model 7 assessed the relationship between fact-check consumption and fact-check sharing. All models controlled for the full complement of sociodemocratic, political, discussion network, and media use variables.

MTurk Data

Core criterion variables in the MTurk data set were continuous. Accordingly, ordinary least squares (OLS) regression modeling was used. Six models were estimated. Model 8 assessed the direct relationship between network informational complexity, EPE, and the use of fact-checking tools. Models 9 and 10 assessed the interactive effects of EPE on the relationship between online and offline informational complexity and consumption fact-checks. Models 11–13 repeated this pattern with a fact-check sharing set as the criterion variable. Finally, Model 14 examined the fact-check consumption-sharing link. All models controlled for the full battery of sociodemocratic, political, discussion network, and media use variables.

Findings

Dynata Data

Model 1 indicated that both online network informational complexity (*b* = 0.13, SE =0.06, 95% CI = 0.02, 0.24, OR = 1.14) and EPE (*b* = 0.33, SE = 0.06, 95% CI = 0.21, 0.45, OR = 1.39) were positively associated with fact-check consumption. Offline network informational complexity was not significantly associated with consuming fact-checks (*b* = 0.10, SE = 0.07, 95% CI = −0.04, 0.23, OR = 1.10). In Model 2, the product term composed of the online network informational complexity and EPE variables was not significantly associated with fact-check consumption (*b* = 0.02, SE = 0.03, 95% CI = −0.04, 0.07, OR = 1.02). Likewise, in Model 3, the interaction term comprised of the network complexity and EPE variables was not related to fact-checking consumption (*b* = 0.04, SE = 0.03, 95% CI = −0.02, 0.10, OR = 1.04).

Model 4 indicated the presence of a direct relationship between fact-check sharing and both online network informational complexity (*b* = 0.15, SE = 0.06, 95% CI = 0.03, 0.26, OR = 1.16) and EPE (*b* = 0.21, SE = 0.06, 95% CI = 0.09, 0.33, OR = 1.24). Model 5 failed to show that EPE conditioned the relationship between online network informational complexity and sharing fact-checking information (*b* = 0.03, SE = 0.03, 95% CI = −0.03, 0.08, OR = 1.03). Likewise, Model 6 did not provide evidence that the relationship between offline network complexity and fact-check sharing was moderated by ESE (*b* = 0.04, SE = 0.03, 95% CI = −0.23, 0.11, OR = 1.04). Model 7 indicated that both fact-check reading (*b* = 0.87, SE = 0.09, 95% CI = 0.75, 0.99, OR = 2.39) and network informational complexity (*b* = 0.15, SE = 0.06, 95% CI = 0.02, 0.28, OR = 1.16) were positively associated with fact-check sharing. However, the previously observed positive relationship between fact-check sharing and EPE disappeared (*b* = 0.06, SE = 0.07, 95% CI = −0.08, 0.19, OR = 1.06). A complete report of Models 1, 4, and 7 is provided in Table 1.

Table 1. Summary of Ordinal Logistic Regression Models Exploring the Relationship Between Fact-Check Engagement, Network Informational Complexity, and Epistemic Political Efficacy (Dynata Data).

	Fact-Check Consumption (Model 1)	**Fact-Check Sharing (Model 4)**	**Fact-Check Sharing (Model 7)**
	OR	**OR**	**OR**
Age	**0.98**	**0.98**	**0.99**
Sex (1 = Female)	1.06	0.95	0.86
Race (1 = White)	0.99	0.84	0.81
Income	0.93	0.93	0.96
Education	1.03	0.98	0.97
Ideology	1.03	1.00	1.00
Dem-rep contrast	**0.67**	0.77	1.05
Dem-independent/other contrast	0.75	0.83	1.04
Political interest	0.90	**0.87**	0.90
Social media use	**1.21**	**1.18**	1.11

News consumption	**1.53**	**1.56**	**1.22**
Online political discussion frequency	1.09	**1.45**	**1.48**
Offline political discussion frequency	1.06	0.91	**0.85**
Online network size	0.98	0.99	0.99
Offline network size	**1.10**	**1.08**	1.02
Online network informational complexity	**1.14**	**1.16**	**1.16**
Offline network informational complexity	1.10	1.08	0.99
Epistemic political efficacy	**1.39**	**1.23**	1.06
Fact-check consumption	--	--	**2.39**
McFadden R^2	.17	.19	.29

Notes. OR = odds ratio; bolded coefficients significant at $p < .05$

MTurk Data

Model 8 indicated that online network information complexity (b = 0.10, 95% CI = 0.02, 0.19) and EPE (b = 0.22, 95% CI = 0.16, 0.29) were positively and significantly associated with fact-check consumption. Offline network complexity, alternately, was not significantly associated with consuming fact-checks (b = 0.04, 95% CI = −0.05, 0.13). There was no evidence that EPE moderated the link between either online network complexity and fact-check consumption (b = −0.01, 95% CI = −0.04, 0.02; Model 9) or the relationship between offline network complexity and fact-check consumption (b = −0.01, 95% CI = −0.05, 0.02; Model 10). Model 11 provided evidence that offline network complexity was positively related to fact-check sharing (b = 0.13, 95% CI = 0.02, 0.23). However, neither online network complexity (b = −0.05, 95% CI = −0.15, 0.05) nor EPE (b = 0.00, 95% CI = −0.07, 0.08) was significantly associated with fact-check sharing. As in the Dynata data, EPE did not moderate the relationship between either online (b = 0.01, 95% CI = −0.03, 0.05) or offline (b = 0.01, 95% CI = −0.03, 0.05) network complexity. Finally, Model 14 indicated that fact-check consumption was positively associated with fact-check sharing (b = 0.49, 95% CI = 0.43, 0.56). Interestingly, after introducing fact-check consumption into the model, a negative and significant relationship was observed between fact-check sharing and both online network complexity (b = −0.10, 95% CI = −0.19, −0.01) and EPE (b = −0.11, 95% CI = −0.18, −0.04), while a positive relationship was observed between offline network complexity and fact-check sharing (b = 0.11, 95% CI = 0.01, 0.21). A complete report of Models 8, 11, and 14 is provided in Table 2.

Table 2. Summary of Ordinary Least Squares Regression Models Exploring the Relationship Between Fact-Check Engagement, Network Informational Complexity, and Epistemic Political Efficacy (MTurk Data).

	Fact-Check Consumption (Model 8)	**Fact-Check Sharing (Model 11)**	**Fact-Check Sharing (Model 14)**
	b	***b***	***b***
Age	0.00	0.00	0.00
Sex (1 = Female)	0.06	0.10	0.07
Race (1 = White)	0.09	0.02	−0.03

Income	**0.51**	0.04	0.01
Education	**0.10**	**0.15**	**0.10**
Ideology	**0.02**	0.10	0.00
Dem-rep contrast	**−0.15**	−0.11	−0.03
Dem-independent/other contrast	**−0.21**	**−0.20**	−0.10
Political interest	0.02	−0.02	−0.03
Social media use	**0.11**	**0.14**	**0.08**
News consumption	**0.41**	**0.59**	**0.39**
Online political discussion frequency	**0.07**	**0.22**	**0.19**
Offline political discussion frequency	**0.07**	**−0.05**	**−0.09**
Online network size	−0.01	−0.10	−0.01
Offline network size	0.00	**0.03**	**0.03**
Online network informational complexity	**0.10**	-0.05	**-0.10**
Offline network informational complexity	0.04	**0.13**	**0.11**
Epistemic political efficacy	**0.22**	0.00	**−0.11**
Fact-check consumption	--	--	**0.49**
F	18,1076 = 123.07	18,1076 = 114.44	19,1075 = 142.29
R^2	.67	.66	.72

Notes. Unstandardized regression coefficients reported; bolded coefficients significant at $p < .05$

Findings Summary

The results generally failed to support H1, which predicted that EPE would positively moderate the relationship between informational network complexity and fact-check consumption. Instead, the data indicated that both online network informational complexity and EPE were positive and direct predictors of fact-check consumption. H2 was partially supported, as the data indicated that online network complexity but not offline network complexity was predictive of fact-check consumption. H3 was supported, as the data indicated that fact-check consumption was positively and strongly predictive of fact-check sharing. Regarding the research question, the results were somewhat difficult to straightforwardly parse. In the Dynata data, there existed a scant indication that network complexity or EPE was related to fact-check sharing after accounting for consumption patterns. In the MTurk data, EPE and online network complexity were negatively associated with fact-check sharing, while offline informational network complexity was positively related to fact-check sharing. The former two relationships appeared to be dependent on the information consumption patterns and only appeared after adding fact-check usage to the equation.

Study 2

To follow-up on the results observed in Study 1, a third data set was drawn from Wave 45 of the Pew Research Center's American Trends Panel (ATP; Pew Research Center, 2020). Pew's ATP consists of approximately 8,000 members that collectively provide a representative rendering of American adults. ATP

Wave 45 data were collected via the Internet between February 19 and March 14, 2020, and contained information from 6,127 respondents. The questionnaire surveyed respondents on topics related to social media use and misinformation. Given that the network information complexity variable (see below) asked specifically about social media–based networks, only those who indicated that they had a social media account (n = 4,603) were analyzed. Because the Pew data set did not contain any information on informational self-efficacy beliefs or fact-check sharing, the primary goal of Study 2 was to replicate the positive association between online network informational complexity and fact-checking use observed in Study 1 in a nationally representative sample. This was important as a primary theoretical thrust of this project was to determine the role—if any—played by exposure to conflicting (i.e., complex) online discussion networks in fact-checking usage. Given that the hypothesized moderation effect was not supported (H1), and, instead, a significant direct association between online information network complexity and fact-check consumption was observed, it was critical to replicate this relationship in an independent sample.

Measures

The use of fact-checks was assessed using a single question that asked respondents if the issue of made-up news and information has resulted in them checking the facts of news stories themselves. Response categories were coded as 0 = have not done so and 1 = have done so. Network information complexity was addressed using a single item that asked respondents to evaluate the following statement: "Thinking about the news that your friends, family and acquaintances post or send you online about political and social issues, overall, do you think the mix of news you get from them: 1 = represents just one side; 2 = represents more than one side; or 3 = they do not send me news about political and social issues." This measure was recoded such that 0 = does not represent more than one side/does not get political information from the network and 1 = represents more than one side.

The Pew data set addressed basic demographic factors related to sex (0 = male, 1 = female), race (1= White, 2 = Black/African American, 3 = Asian/Asian American, 4 = mixed race, 5 = other; recoded as 0 = non-White, 1 = White), age (1 = 18–29, 2 = 30–49, 3 = 50–64, 4 = >64), annual income (1 = <$10,000, 9 = $150,000 or more), and educational attainment (1 = <high school, 6 = postgraduate). For political factors, the data set assessed party ID (recoded such that Democrat was set as the contrast category), political ideology (1 = very conservative, 5 = very liberal), and political interest ("*Would you say you follow what's going on in government and public affairs?*"; 1 = hardly at all, 4 = most of the time). Finally, a number of media use variables were assessed. To measure news use, respondents were asked about the frequency with which they "get news from a news website or app" (1 = never, 4 = often). The extent to which social media was used to access the news was similarly assessed using a single item ("How often do you get news from a social media site such as Facebook, Twitter, or Snapchat?"; 1 = never, 4 = often).

Sample Description

In terms of gender, 59.5% (weighted =54.9%) were female, 77.3% (weighted = 72.9%) were self-classified as White, the median age category was between 30 and 49 (weighted = between 30 and 49), the median income was between $50,000 and $75,000 (weighted = between $50,000 and $75,000), and the median level of education was an associate's degree (weighted = some college but no degree). For party

identification, 25.5% of the sample identified as Republican (weighted = 25.1%), 37.5% identified as Democrat (weighted = 33.5%), and 37.1% identified as an independent or a member of another party (weighted = 41.4%). The mean values on the political ideology and political interest variables were 3.05 (SD = 1.07; weighted M = 3.01, weighted SD = 1.04) and 3.23 (SD = 0.93; weighted M = 3.10, weighted SD = 1.00), respectively. For both the news and social media news use variables, the median raw and weighted values were "sometimes." Finally, 83.5% of the sample reported engaging in fact-check behaviors (weighted = 81.7%), and 37.1% reported having social media networks in which multiple sides of issues and events were typically discussed (weighted = 35.9%).

Analytic Strategy

The *svydesign* function in the *R* package *survey* (Lumley, 2023) was used to properly estimate model-related standard errors (and, in so doing, allow for population-level inference). The fact-checking variable was a dichotomous categorical variable and was therefore addressed using logistic regression.

Findings

As shown in Table 3, the results of the logistic regression model indicated the presence of a positive relationship between network informational complexity and fact-check use; b = 0.92, SE = 0.14, 95% CI = 0.66, 1.19, OR = 2.52.

Table 3. Logistic Regression Models Exploring the Relationship Between Network Informational Complexity and Fact-Check Usage (Pew Data).

	OR
Age	**0.85**
Sex (1 = Female)	0.92
Race (1 = White)	**1.56**
Income	1.02
Education	**1.08**
Ideology	1.03
Dem-rep contrast	0.96
Dem-independent/other contrast	1.16
Political interest	**1.42**
News consumption	**1.37**
Social Media for News	1.01
Online network informational complexity	**2.52**
McFadden R^2	.21

Notes. OR = odds ratio; bolded coefficients significant at $p < .05$

Discussion

This study provides general evidence that individuals embedded within communication networks hospitable to the production of inconsistent political information are increasingly likely to engage with fact-checking resources. Across three datasets, a consistent relationship between network informational complexity and the use of fact-checks was observed. Therein, the data provided evidence that the online network informational complexity is more important than offline network informational complexity in explaining fact-check use. To some extent, this finding suggests that while "fact-checking" has been an element of normative journalistic practice since (at least) the post-WWII era, the notion of accessing a specialized informational provider for the purposes of explicitly adjudicating a political claim is, broadly speaking, a digital phenomenon. Several factors could explain this observation. First, as mentioned earlier, social media affordances (e.g., Brundidge, 2010; Conole & Dyke, 2004; Eveland et al., 2004) could simply result in a scenario wherein fact-checking information encountered on the Internet is comparatively free of barriers. This would imply that fact-check engagement frequently occurs out of convenience or in otherwise incidental contexts. Another explanation could be related to the nature of the information being exchanged online. Research has shown, for instance, that online political communication, when compared with offline discussion, is more likely to feature disagreement (e.g., Barnidge, 2017). Moreover, mis- and disinformation, as currently conceptualized in the literature, are disseminated predominantly via online networks. As such, in online settings, people may encounter a comparatively greater volume of conflicting and/or dubious information, leading, ultimately, to heightened use of fact-checks.

Within the broader context of empirical work on fact-checking, the observed relationship between online network informational complexity and fact-check involvement is important, as it is one of the first fact-checking studies to assess effects linked to network information characteristics. In other words, the findings presented in this work build on prior work on fact-checking (e.g., Amazeen et al., 2019; Graves et al., 2016; Robertson et al., 2020) to suggest that network factors, in addition to individual difference variables and motivational orientations, play a substantive role in understanding why people use fact-checking tools. Certainly, acquiring a full understanding of the effects of individual-level factors, such as political ideology on information-seeking and sharing behaviors is important. However, it is also important for scholars to appraise the external social conditions within which individual information-seeking and evaluation behaviors occur.

Having said that, this study *does* make a meaningful contribution to the contemporary state of knowledge on the relationship between individual attributes and fact-checking usage. First, and linked to the point made above, the current work provides practical evidence of the extent to which fact-checking engagement is linked to broader patterns of news consumption and information exposure. For instance, in two of the three datasets, a positive and significant linkage between general social media usage and fact-check consumption was observed. From a reportorial perspective, this finding solidifies the above-articulated notion that fact-checks are an online phenomenon, and, therein, the act of fact-checking information may often be stimulated by incidental exposure to information encountered on social media. Moreover, in line with prior work, the data suggested the existence of linkages between fact-checking and age, partisan, and media consumption factors (e.g., Lyons et al., 2020; Robertson et al., 2020). Notably, however, these effects were not consistently apparent across all three datasets, suggesting that some sociodemographic

effects may be subject to conditioning factors. Perhaps more importantly, this study provided evidence of a fairly robust relationship between EPE and consuming fact-check information. Therein, the lack of observed moderation effects suggests that this effect exists independent of informational context.

On the topic of EPE, it is important to note that some prior scholarship has constructed the variable as an outcome of successful epistemic activities. For instance, York et al. (2020) found that exposure to fact-checking information enhanced perceptual accuracy capabilities (i.e., the ability to accurately recount factual realities), which, in turn, enhanced individual EPE levels. The present study, alternately, suggested that EPE would be predictive of fact-checking engagement. These alternate specifications are not at theoretical odds with one another. General self-efficacy theory (e.g., Bandura, 1982) broadly holds that self-efficacy beliefs are developed, in part, through mastery experiences (i.e., successful task completion). The accumulation of mastery experiences results in the generation of self-efficacy resources that can, in turn, be used for future (successful) navigation of a given domain (Bandura, 1982, 1997). In the current case, this means that EPE may motivate engagement with fact-checks and, in so doing, result in a bolstering of epistemic self-efficacy perceptions. The existence of such reciprocity provides one potential pathway by which fact-checking may be able to positively affect modern-day political knowledge conditions.

Although not a core emphasis of the current project, the results of Study 1 indicated that online political discussion may be an important predictor of fact-checking engagement. In the Dynata data, online political discussion frequency was associated with sharing fact-checks. In the MTurk data, there were positive relationships between online political discussion frequency and both consuming and sharing fact-checking resources. These findings are consistent with Robertson et al.'s (2020) finding that political discussion frequency was positively associated with fact-checking website familiarity and might suggest that fact-checking tools are used to both make sense of others' political claims and substantiate arguments or claims made by the ego. Another potentially interesting finding that was tangential to the primary focus of this study was the tendency of Republicans, relative to Democrats, to avoid using fact-checking tools. This points to a continuation of partisan disagreement over the facts and how they are produced and adjudicated (e.g., Shapiro & Bloch-Elkon, 2008).

This study is subject to limitations. A garden variety of measurement and operationalization concerns are present in the Pew data set. Perhaps more importantly, the Pew data set did not contain a measure of EPE and did not account for discussion frequency. More broadly, this work, like other self-report-oriented inquiries into media behaviors, suffers from issues related to participant recall and behavioral specificity. Respondents may conceptualize their fact-checking behaviors (or lack thereof) in different ways, and these different mental construals may impact their response patterns in unknown manners. Moreover, one of the samples used in this project was drawn from the MTurk population, which has well-documented limitations. And, the MTurk sample, in contrast to the Dynata and Pew samples, disproportionally (relative to population-level averages) featured well-educated respondents and respondents who identify as Democrats. The MTurk sample was also associated with substantially higher levels of model-explained variance relative to the other two samples. This can be attributed—at least partially—to strong bivariate relationships between fact-check consumption and news consumption, social media use, online and offline discussion frequency, online network complexity, and EPE, and strong bivariate relationships between fact-check sharing and fact-check consumption, news consumption, social media use, online and offline

discussion frequency, online and offline network complexity, and EPE (all *r*'s > .40). The observation of these strong associations could be tied to the broad nature of the fact-check consumption and sharing measures used in the MTurk sample, the sample's tendencies toward heavy Internet usage, or some combination of these factors.

Despite its limitations, this study makes several potentially important contributions to the contemporary literature on fact-checking. Future work can build on the findings presented here in any number of ways. Scholars could, for instance, explicitly and narrowly address this study's assumption that complex network structures generate heightened feelings of epistemic uncertainty. It may also be interesting to better understand the fact-check consumption-sharing relationship. The data presented here indicate that while reading and sharing fact-check behaviors are strongly associated, they may also be associated with a range of unique motivational factors.

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