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Libraries Combating Disinformation: From the Frontline to the Long Game

Francesca Bolla Tripodi, Jade Angelique Stevenson, Rachel Slama, and Justin Reich

Abstract

There is an urgent need to build the public's resilience to disinformation. Librarians are trusted community members capable of taking on this fight, yet they may be hesitant to assume a frontline role in confronting politicized misinformation. We conducted ethnographic observations and interviews across three Montana libraries to understand the informational needs and search habits of library patrons and the role that librarians play in promoting effective search practices. While Montana poses a unique set of challenges regarding broadband speed and access, our findings replicated studies in school settings across the country regarding a reliance on antiquated search literacy techniques. Librarians interviewed expressed challenges with confronting patrons about specific information claims that might be politically sensitive but expressed confidence in their ability to build patron trust and teach effective search literacy practices. Based on this research, we built and tested interventions designed to enable librarians to build out their long game and empower patrons across the United States to better confront misinformation now and in the future.

Libraries Combating Disinformation: From the Frontline to the Long Game

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Misinformation is one of the most pressing concerns of our time, threatening the financial, physical, and democratic health of the United States. This erosion of trust costs the United States between \$50 and \$300 million daily (Bruns et al. 2021), contributes to an ongoing public health crisis (Jennings et al. 2021), and dilutes democratic integrity (Swann 2022). A range of scholars have demonstrated how propagandists make use of information systems to spread problematic content (Benkler, Farris, and Roberts 2018; Chen et al. 2021; Nisbet, Mortenson, and Li 2021; Ognyanova et al. 2020; Tripodi 2021). In this study, we take up the question of how libraries and librarians could become a central part of the solution.

Much research on mis/dis/mal information emphasizes the networked and sociotechnical effects of problematic content. Social network studies tend to emphasize the role platforms and content producers play in amplifying false claims (Donovan 2020; Freelon and Lokot 2020; Freelon and Wells 2020; Uyheng, Bellutta, and Carley 2022). Sociotechnical researchers rely on more qualitative methods and theoretical arguments to better understand why false claims become believable (Marwick 2018; Tripodi 2018; Anderson 2021; Marwick and Partin 2022; Tripodi 2022). This research is essential for understanding the size and scope of the problem but does not get at the day-to-day

reality that most adults never learned how to adequately assess the credibility of information and easily fall prey to bad actors and scams online (see Wineburg and McGrew 2019 for a review). Existing digital discernment strategies that promote “checklist approaches”—exercises designed for audiences to evaluate things like currency, relevance, accuracy, and authority—are not extremely effective because they were not designed for the web at all. As Mike Caulfield (2018) explains, these tactics were developed for selecting library resources on a limited budget. Unfortunately, these antiquated strategies are prolific, encourage endless scrolling on the same website, and typically rely on weak and easily gamed markers of credibility (Breakstone et al. 2018; Caulfield 2018).

Misinformation thrives in what these solutions encourage—vertical reading. Vertical reading is the habit of scrolling up and down a website to determine if the site’s sources seem trustworthy, reading the “about page,” scrutinizing the domain extension (e.g., .com [supposedly bad] or .org [supposedly good]), or checking to see if there are grammar mistakes (Breakstone et al. 2021a; Brodsky et al. 2021a, 2021b). Propagandists exploit weak search literacy skills and seed the internet with problematic content designed to maximize search engine optimization (Tripodi 2022).

To confront pandemic disinformation now and in the future, libraries need to teach people lateral reading by encouraging patrons to get off the page, open new browser tabs, and read across those tabs to see who is behind the source. Research on these practices demonstrates that when people are taught how to use lateral reading techniques, their ability to sort truth from fiction online quickly

and measurably improves (McGrew et al. 2019; Wineburg and McGrew 2019; Kohnen, Mertens, and Boehm 2020; McGrew 2020; Breakstone et al. 2021a; Brodsky et al. 2021a, 2021b). Building on this research, we argue that there is an urgent need to build the public's resilience through educational interventions. Focusing on a set of discrete search skills allows librarians to focus on the *process* versus the quality of the information itself, which is often politically charged and can make librarians reluctant to intervene.

The premise of the study builds on the notion that librarians, as established stalwarts in their communities, can provide “information, shelter, and calm in their community during a time of maximum disruption” (Jaeger et al. 2021, 1). Librarians are positioned to teach patrons how to identify disinformation. However, to create effective interventions, we must first gain a deep understanding of the way adults search for information online and understand how librarians currently respond to patron search literacy needs. We designed a research study around three core questions: 1) What are the informational needs of adult library patrons (i.e., why do they come to the library?); 2) Do their needs impact their search practices? and 3) To what extent do librarians feel comfortable intervening in patrons' search habits? To answer these research questions, we traveled to Montana and conducted ethnographic observations inside three libraries, interviewed six librarians and two university extension educators, conducted open web search tasks (“think aloud”) with fifteen library patrons, and conducted usability testing on a short educational video designed to improve search literacy.

While the location of our study is unique given the explicit challenges residence living in isolated geographic areas face (e.g., slower internet speed and limited connectivity), we posit that much of what we found is relevant to librarians throughout the United States. Specifically, librarians must work hard to meet the needs of the library patrons which vary greatly depending largely on socioeconomic factors – a challenge not exclusive to Montana (Jaeger et al. 2013). Our findings also indicate that access does not necessarily match search skills. Regardless of socioeconomic status, patrons relied on relatively similar search tactics which replicate studies conducted with college students across the United States. Thus, our study illuminates the role librarians could play in confronting pandemic disinformation beyond the Great Plains, by shifting away from addressing specific information or misinformation claims and focusing more explicitly on the skills of effective search literacy. Based on our findings, we argue that librarians can serve both a role on the “frontline” of COVID-19 disinformation (Gibson et al. 2017) but also strategize for the long-game, preparing their patrons for the next wave of false claims as they arise and improving the public’s search skills at scale.

Literature Review

Misinformation: Networked, Sociotechnical, And Educational Effects

To date, most scholars studying misinformation are focused around three general areas: networked effects, sociotechnical effects, and educational effects. Social network studies seek to better understand the systems that enable the spread of

bogus claims. As such, this research tends to emphasize the role platforms play in creating an infrastructure ripe for misuse, often relying on web scraping and data analytics to map out how bad actors exploit those systems to amplify and circulate misinformation (Donovan 2020; Freelon and Lokot 2020; Freelon and Wells 2020; Ognyanova et al. 2020; Uyheng, Bellutta, and Carley 2022; Chen et al. 2021; Nisbet, Mortenson, and Li 2021). As research demonstrates, the most effective misinformation campaigns “trade up the chain”—planting stories in local/smaller news outlets insufficiently capable to fact-check claims with the goal of having the story amplified by a larger news outlet (Marwick and Lewis 2017). Whether the claim ends up debunked or promoted, the original falsity traverses between social media and legacy networks to gain credibility (Krafft and Donovan 2020; Tripodi 2022). Propagandists, conspiracy theorists, and hostile foreign governments have a sophisticated understanding of how tags and metadata work. They regularly seed the Internet with problematic content and tag it with keywords designed to surface and amplify those ideas (Tripodi 2019a; Tripodi 2019b; Tripodi 2019c).

Sociotechnical researchers try to understand why and how misinformation is believed by highlighting the epistemological frameworks misinformation efforts rely on (Benkler, Farris, and Roberts 2018; Marwick 2018; Tripodi 2018; Anderson 2021; Tripodi 2022). For example, Leon Yin, Franziska Roscher, Richard Bonneau, Jonathan Nagler, and Joshua A. Tucker (2018) found that propagandists carefully construct false identities to appear relatable and authentic. Qualitative studies on how groups use and interact with information on Facebook

sheds light on the context behind why misinformation is believable and demonstrates the way data is manipulated to reflect existing logics and sociopolitical positions (Marwick 2018; Lee et al. 2021; Tripodi and Ma 2022). Tactics for spreading disinformation often exploit the human desire to fact-check information and encourage audiences to engage in knowledge-making activity and participatory affordances to create “alternative facts” (Marwick and Partin 2022). This “IKEA effect of misinformation” makes audiences feel like they are drawing their own conclusions, thereby valuing misinformation more than simply watching or reading vetted journalists give them the news (Tripodi 2022). In short, propagandists are invested in a participatory model not unlike organized fandom who evaluate, debate, and negotiate common texts (Jenkins 1992). Given the important role that the mantra “do your own research” plays in spreading misinformation (Tripodi 2018), there is a need for research-backed tools and enhanced educational training that help users recognize the sources behind online claims and to effectively verify information.

Effective Search Literacy Interventions in Public Education

A group of researchers have been working in this intervention area for nearly a decade, documenting missteps that high school and college students take when evaluating digital content online and building tailored interventions that improve students’ digital savviness. Joel Breakstone, Mark Smith, Sam Wineburg, Amie Rapaport, Jill Carle, Marshall Garland, and Anna Saavedra (2021b) gave a representative sample of 3,446 high school students a live internet connection to

complete a series of online search tasks. The majority of students were not able to identify that a site denying humans' role in global warming (what the site refers to as “climate science”) was tied to the fossil fuel industry. Instead of using lateral reading techniques and opening additional tabs to investigate the organization behind a particular site, students relied on weak markers of credibility such as the website’s appearance, the domain, and the about page. The study authors highlight an “urgent need” to better prepare students to evaluate the credibility of digital content in a networked world.

This work builds on studies of how professional fact checkers working for major news outlets evaluate sources online (e.g., Wineburg and McGrew 2019). The authors compared the live online search practices of ten historians, twenty-five Stanford undergraduates, and ten professional fact checkers as they evaluated live websites and performed internet searches on social and political issues such as bullying, minimum wage, and teacher tenure. Using think aloud methodology, participants were encouraged to verbalize their actions and thought processes as they searched the open web in response to a series of prompts asking them to evaluate the reliability of a given site. Researchers recorded participants and their screens as they performed a timed search task. The study team found that on every search task, fact checkers significantly outperformed historians and students in their ability to accurately judge the reliability of the given websites as well as the time it took them to arrive at their conclusions.

While historians and students often read vertically—scrolling up and down on a website looking for superficial markers of reliability such as polished

websites and logos and domain names, fact checkers read laterally—quickly hopping off the page in question, opening new browser tabs, and using other websites to gain more information on the source behind the information. Mirroring the strategies of fact checkers, researchers have designed brief but effective interventions for college and high school students using live internet search tasks. These learning modules teach the skills that fact checkers use to evaluate digital content in a variety of learning environments including a college course on nutrition (Breakstone et al. 2021b), a college civics course (Brodsky et al. 2021a, 2021b), two 75-minute lessons with college writing students (McGrew et al. 2019), and brief curricular interventions with middle and high school students ranging from one day (Kohnen et al. 2020) to eight lessons (McGrew 2020) and across an entire urban school district (Wineburg et al. 2022) and country (Pavlounis et al. 2021). In most cases, the number of students able to use the more efficient search practices increased significantly following just a brief intervention, regardless of the information environment.

Research on the network and sociotechnical effects of information provide important insights into how disinformation spreads online; yet few have considered the possibility of interventionist approaches outside of school environments. Educational studies have outlined key interventions to address shortcomings in search literacy, but most are bound to classroom settings. This paper seeks to bridge the gap between these bodies of research. We know from network studies that propagandists exploit loopholes in search literacy, and we see through ethnographic studies that how people assess and trust information is

contingent on their cultural settings, but little research has been done on the promise and possibility of scaling search literacy interventions beyond schools. To do so, we first need more research on how adults engage in search as part of their everyday lives: What are patrons' everyday information needs and do varying levels of access shift their ability to search for information online? Can they spot problematic content? What role can the library play in bridging the gap between disinformation networks and the tools people need to embody a fact-checker mindset?

The Promising and Challenging Role Librarians Can Play in Combating Misinformation

Given the pervasiveness of the misinformation crisis, there is increasing recognition that libraries, as public-facing and embedded institutions, have an important role to play in building the public's resilience against misinformation (Young et al. 2021). Jason C. Young, Brandyn Boyd, Katya Yefimova, Stacey Wedlake, Chris Coward, and Rolf Hapel (2021) point to the need for librarians to refresh existing approaches to best combat new forms of misinformation.

Librarians are well-suited to address misinformation because they regularly support patrons with new technology, and importantly, they enjoy a strong degree of trust from their public constituents which is significant given the overall decline in trust in public institutions (Sullivan 2019). Based on a series of interviews and workshop discussions with libraries in Washington State, Young and colleagues (2021) proposed a research agenda to strengthen the role of

libraries and librarians in combating misinformation which includes building tools to help librarians and developing programming to eliminate barriers that prevent librarians from engaging in controversial topics.

The American Library Association has publicly supported the role of libraries in educating the public about misinformation (American Library Association 2018). Yet some librarians might also be hesitant to intervene in causes perceived as partisan (Kendrick and Damasco 2015). While disinformation refers to purposefully misleading information spread with intent, critical disinformation theorists explain how alternative facts are steeped in historical legacies designed to maintain existing power structures (Kuo and Marwick 2021). The prevailing narrative that libraries must act as “neutral entities” thus hinders the work librarians feel they can truly provide (Gibson et. al 2017). We agree that libraries have a responsibility to engage with patrons during times of crisis and serve on the “frontline” to help patrons gain the skills they need to access quality information on their own terms (Gibson et al. 2017; Gibson and Martin 2019). At the same time, we recognize that libraries are dependent on the fiscal decisions of the representatives that govern them. If librarians are forced to reckon with the *content* of the information and take on the role of the fact-checker, they may find themselves in a precarious spot. Focusing on the content is also *reactive*, librarians must also form a long-game, a way to anticipate the ever-mutating nature of disinformation.

This approach mirrors the advice of Young and colleagues who note effective campaigns are contingent on acknowledging how personal beliefs (and

emotion) interact with misinformation (Young et al. 2021). It also highlights librarian Nicole Cooke's call to pay more attention to the *context* in which information is shared and believed (Cooke 2017). However, to best leverage the talents and position of public libraries, we first need to know whether design principles driving effective interventions for students would also work for adult library patrons. As suggested by Brenda Dervin (1976), examining what constitutes *a problem* for the population brings us closer to identifying a solution. By considering the important role misinformation plays as an "information behavior," we can also form an "organizational culture" that responds to these needs and lead to a common sense of community among library patrons to encourage their adoption of search literacy tools and interventions (Huotari and Chatman 2001). Libraries are a perfect node in this network, a safe space for many who would otherwise be cut off from the world, a provider of consistency during uncertain times (Guernsey, Prescott, and Park 2021; Jaeger et al. 2021).

Our research study investigates this potential, looking at whether search strategies proven effective in formal education settings like schools and universities also hold promise for helping adult library patrons. We first sought to learn about the informational needs of adult library patrons to better understand if access also impacted their search practices. We also wanted to gauge if librarians felt prepared to intervene when it came to improving patron's search habits.

Methods

In November 2021, our research team arrived in Montana to collect qualitative data which consisted of participant observation, interviews, search tasks (i.e., think aloud), and video screenings. All participants actively consented to participate in the study activities and received a \$25 gift card to compensate them for their time participating in the study tasks. The study was included as part of the Institutional Review Board (IRB) protocols of the authors' institutions.

Data Collection

Ethnographic observations were conducted at two libraries in Montana (urban and rural) where we spent approximately six hours each day at the public library observing patron behavior and interactions with librarians. We also conducted in-depth interviews with librarians at three libraries (urban, rural, and tribal) and two extension agents affiliated with a state university satellite campus. Through observations and interviews, we were able to identify the informational needs of patrons who visited the library and better understand how regularly they interacted with library staff. Interviews lasted an average of one hour, were audio recorded with permission, and transcribed using rev.com.

Open-Web Search Tasks

In addition to gauging why people come to the library (i.e., their informational needs), we also wanted to better understand their search capabilities. To answer this research question, we designed a series of interactive search tasks ("think aloud") and conducted these tasks with fifteen patrons. The goal of these search

tasks was designed to assess what skills patrons used to evaluate the trustworthiness of a website. During these tasks participants were encouraged to navigate the web as they normally would and open as many tabs as needed to make their decision.

Minimum Wage Prompt

Based on a task used in prior research (e.g., Wineburg and McGrew 2019), we asked patrons to pretend they were doing their own research on the topic of minimum wage before making an election decision and assess the quality of information from this website: <https://epionline.org/minimum-wage/> (Figure 1). Patrons were told they were free to scroll up and down on the website, click on any links within the webpage, or open a new window or tab to search outside of this site to make their decision. After about five minutes of searching, we would ask participants to explain whether epionline.org was a reliable source of information about minimum wage laws.

In addition to this minimum wage task, we conducted two additional open-web search tasks: one comparing two websites about animal testing (one a Wikipedia page, and one an essay on lonestar.edu that turns out to be a student paper) and a second task about land use decisions in Montana to investigate how search terms influence returns.

Retro Report Search Literacy Video

During our interviews with librarians, we also screened a short video on how to improve search literacy. These videos were created by Retro Report, a documentary news organization that produces short-form documentaries for historical context, as part of our team's NSF Convergence Accelerator Research Grant (NSF, 2021). We used these videos as a launching point to learn more about how librarians see themselves as search experts and if they envisioned using the videos or engaging in search literacy training at their library. We also sought their feedback on how we might improve the content to better resonate with their community's informational needs. When time permitted, we would screen the videos with patrons as well to see if the content resonated with their informational needs/interests and asked if they took away any new skills or tips from the video.

Analysis

Analysis of observations, interviews, and analysis were guided by the principles of grounded theory to move beyond description with an emphasis on constructing thematic conceptions (Charmaz 2006). Analysis happened simultaneously during data collection but was also iterative — meaning that our team repeatedly engaged in field notes and transcripts after field observations, interviews, and think aloud search tasks were complete (Charmaz and Thornberg 2020). After returning from Montana, we conducted an “open coding” process where the researchers read transcriptions and viewed the screen recordings of search tasks to determine emergent categories in connection to the themes identified during field work and in relevant literature. After flagging particularly salient “in vivo codes”

(Charmaz 2006), we worked together to create a codebook, and then conducted a more thematic analysis of our transcripts using those codes as a guide. Rather than focusing on phrase frequency, qualitative coding seeks to identify underlying meanings, patterns, and processes behind what we observed (Altheide 2000). By drawing on participant observation, interviews, and think aloud search tasks, we were able to triangulate our data and strengthen the validity of our findings.

While residents of Montana are not necessarily representative of the broader U.S. population, situating our observations in more rural areas provided a unique view of the everyday search practices of Americans and allowed us to consider how internet access might influence search literacy techniques. Moreover, the extreme socioeconomic and cultural diversity of the libraries we observed speaks to the wider challenges librarians face when it comes to effectively serving diverse communities in an inclusive way (Jaeger et al. 2013).

Findings

Informational Needs of Adult Library Patrons

One of the most immediate findings from our data was that patrons are an eclectic mix of people who tend to come to the library for a variety of reasons. We found that patrons' interactions were largely contingent on whether they needed assistance from the library staff and whether they planned on spending a lot of time in the building. In Figure 2 below, we summarize the need for library assistance and the time spent in the library for four distinct groups we identified.

Patrons who tended to rely on library staff for assistance had basic needs and had limited access to technological services. Within this cluster we observed two subgroups. Group One came to the library for free services and typically did not have internet connectivity or a computer in their home. Patrons we saw in this group were also in the library to get warm or because they needed to find a safe space. We witnessed patrons in this group come back to the library frequently (some were there every day that we were) and most often used the free computers to check email, apply for supplemental nutrition assistance, file for social security benefits, or other temporary assistance programs. On one occasion, we witnessed a domestic disturbance. Because of the geographic layout of the state, many librarians we interviewed explained how connectivity is still an issue at home. However, those in this category still often brought their own mobile phones with them to the library to access wifi. In other words, they are disconnected from high-speed internet at home, but they bridge that gap by purchasing phones through Walmart that do not need a service plan. As a network librarian we interviewed explained, “I think for the majority of them, it's access issues...this group of high-need individuals may be homeless and have no access and need a lot of help.”

Group Two also interacted regularly with the library staff, but often had specific informational needs or were asking for help using the paid services like making photocopies or printing forms. The network librarian described these patrons as a middle group that “functions pretty well” with technology but does not have as much ready access to high-speed internet in their homes. These

patrons tended to have jobs and needed services from the library to complete that job. For example, during our observations we documented a truck driver who came in to print forms and a stay-at-home mom who came through to make copies from a workbook that their child was using for home-schooling. To accommodate the needs of this group, one of the libraries we observed created a Tech Cafe where patrons could come with their tablets or laptops and receive personalized assistance. In our interview with the tech librarian, we learned that during these workshops, she would teach patrons how to create group-chats, search for specialty items online, and create secure passwords. This group also tended to stay at the library for a long period of time, but we did not see them as regularly as those with less resources or access. As one librarian noted of those in this group, “I’ve seen people sit for hours out there doing taxes or whatever they’re doing, trying to get their life in order with all the paperwork all over the place, and like scanning documents and like they know what they’re doing for the most part.”

Other patrons still took advantage of the programs and resources at the library, but they only occasionally asked for assistance from the librarians. Librarians we interviewed described these patrons as “technologically savvy” and we noticed that those in this cluster seemed to comprise a higher socioeconomic status than those who relied on the library for access. We made this distinction based on the kinds of questions they asked us, the attire that they wore, as well as their lack of interest in the \$25 incentive for participation. Likewise, we noticed

that patrons in this cluster made use of library resources as a form of leisure rather than necessity.

We observed two subgroups within this cluster of patrons as well. Group Three came to the library and would stay for a few hours. They were there to participate in events designed for them (e.g., a children's reading group or a Girl Scout troop meetup). They were taking advantage of the library as a free space to gather but were not dependent on the resource as part of their informational needs. Group Four was also there for entertainment purposes and tended to use the library for very short visits. Some would browse the shelves before selecting a book, but they had minimal interaction with library staff. Often, they were in and out of the library quickly (less than fifteen minutes) to pick up books placed on hold or return books that were due.

During an interview, a librarian acknowledged how difficult it is to serve patrons with such a different range of informational needs: "I mean, you truly get the full spectrum of every type.... I mean, it's just flips on the extremes all the time between very destitute in need, having serious problems at that moment versus extreme comfort and just coming into the library to pick up their holds like they do every Thursday or whatever after their work... So the range of patrons, I don't even know how to explain it more than that. It's as extreme as you could think."

Nonetheless, those we interviewed were quick to push back on the idea that rural patrons would be less tech-savvy just because they lived on a farm. Specifically, they explained that some patrons use computers to carry out daily

duties as part of their occupation: "some of those farm and ranch guys, they can be really, really smart on a bunch of [computer-related] things. A lot of them do a lot of work on the computer." This was confirmed during search tasks with patrons, where one person explained how they use the internet to sustain their livelihood as an organic chicken farmer: "It takes a lot of organic feed, and we don't buy the first guy's feed. Anybody can come up and jump and say, "Hey, I'm an organic farmer." No. We get out and search. We've had this farm now for, let's say 10, 15 years...We get on the internet and we start. We buy product out of Canada, because we're right on the Canadian border....We just click on the internet and start searching." This patron, who was also the owner of an organic chicken farm, did not necessarily have high levels of internet access, but demonstrated some basic search skills related to internet use in their daily work.

Using ethnographic and interview data, we found that access—in particular, access to the internet as well as basic social services—really determined the extent to which people stayed at the library as well as the level of engagement they tended to have with library staff. These findings coincide with research that documents what is widely conceived of as a “digital divide”; most of those in Group One had low connectivity quality and little autonomy of use (DiMaggio and Hargittai 2001). Moreover, our findings mirror national studies which document that roughly thirty percent of rural Americans still do not have broadband internet connections in their home (Vogels 2021). However, our interviews also revealed that even patrons with limited access might be highly savvy when it came to finding information online. As research demonstrates,

access does not always tell the full story when it comes to internet capabilities and our research team wanted to better understand the extent to which a “second-level digital divide” existed regarding search literacy (Hargittai 2002).

Search Literacy: Different Needs, Same Gaps

To better assess patrons' search literacy techniques, we conducted a series of search tasks with a wide range of patrons in each of the four groups (Exhibit 2). By situating ourselves at the library for many days, and recruiting patrons as they arrived, we were able to conduct these tasks with a wide range of patrons who represented the eclectic needs noted in our observations and described in our librarian interviews. Despite a demonstrated range of information needs, we noticed consistency in how patrons searched for and evaluated information. Even more surprising was that the literacy skill gaps of adults living in Montana generally mirrored those of k-16 students: overreliance on top-level domains to evaluate credibility of a site, reading vertically by doing a close read of one site rather using the web like a web and reading laterally, and an absolute mistrust of Wikipedia for any purpose.

Similar to internet search studies from two-decades ago, participants who completed the search tasks had a very difficult time finding information that met their everyday needs (Hargittai 2002). Here one patron explains why they would trust a source based on the domain extension, even if they did not find the source particularly trustworthy. This patron described an absolute distrust of the government, but then relied on the domain extension .gov to establish credibility:

“Then, I would go through, well, here we go. Dnrc.mt.gov, so, .mt.gov indicates they're at least getting firsthand resources from Montana's government, so we can probably trust what we're going to find here for at least information.”

Patrons also used the .org or .edu extension as an indicator of reliability—a finding that replicates prior work (Hargittai and Young 2012; Wineburg et al. 2016; Hargittai 2000; Breakstone et al. 2021b): “Lonestar.edu. That looks legitimate to me. See, right away, I just want to go to about, because this is the first step I always take when I go to a website. I want to know who this is. See how they have a statement here? Lone Star college system provides for comprehensive educational opportunities and programs to enrich lives...They have accreditation.” While this patron was correct to note that Lone Star is indeed an accredited university, the page that they were reviewing was a student paper uploaded by a faculty member at the school. It was not peer-reviewed research, but because it was on a .edu website, the patron believed they could trust the information over a Wikipedia entry because Wikipedia was a website that anyone could edit and was just a .com.

In addition to looking at the domain extension, most patrons tended to stay on the page and read vertically, rather than get off the page and open a new browser, what researchers refer to as lateral reading. To gauge this skill, we had patrons access the credibility of a website created by the Employment Policies Institute (<https://epionline.org/minimum-wage/>). For those unfamiliar, the Employment Policies Institute (EPI) is a fiscally conservative organization aimed

at lowering the minimum wage in the United States whose staff work a public affairs firm that lobbies on behalf of the restaurant and hotel industries.

Prior to looking at the site, we would ask patrons if they had an opinion on minimum wage. We found that because patrons would read deeply on the webpage to evaluate its credibility (e.g., reading the about page or judging the aesthetic appeal of the site), they would frequently consider the website a credible source of information, even if they disagreed with the messaging and wanted to increase minimum wage laws.

For example, one patron was initially skeptical but changed their mind based on information provided by The Employment Policies Institute: “More information about who's writing this, what they're trying to accomplish. There's no statement like what they want. Employment Policies Institute. What is that? Who's that? Who's the members....I want to know more. There's not enough information here. Even the about us page is very blank. You yourself can see, we have a list of one person. That's already disheartening, but they do at least give a phone number. Maybe I'll call them. I'm not media, but I could call them anyways.” This patron also expressed skepticism of the site, noting that producers can manipulate data to frame the story they want to tell, yet they remained on the website created by the source of the information rather than navigating to other sources to determine if the source was biased: “Well that they've already cited a book. That's a nice thing. That they agree that there are different sites [sides] to the story. Those are nice green flags of, yeah, continue reading this. This is not going to be just a one sided things. So I think it's fairly green. Spouting the 60%.

Starting off with numbers at the very beginning kind of gives the red flag. It's more of a yellow flag for me, because you can make your numbers say, whatever you want them to say.”

We hypothesized that part of the reason patrons believed that special-interest websites were neutral informational resources was they were thinking of the short open-web search tasks as long-form research projects, noting that they needed more time to really investigate whether the source was credible. However, patrons repeatedly indicated that more time to spend on the task would mean more time spent *on the site* (i.e., vertical reading)—reading more of the information on the about page or clicking on the sources referenced by the website creator, rather than opening a new tab to see if the source itself was reputable. In this brief exchange, a patron explains what that evaluative process would look like:

Researcher: Would you trust this website?

Patron: I don't know. I'd have to sit here and read through it and go through it all...

Another patron made a clear connection between the search task and a research task: “I try to read as much as I can [when evaluating sources] because I believe that if I'm going to be researching something, I need to get as much information as I can.” This search behavior mirrors previous research that participants start with a close “vertical” read of a website to evaluate its trustworthiness (e.g., Wineburg and McGrew 2019).

We also observed a discrepancy between participants' self-reported search skills and their actual search behavior. When time permitted, we would screen a short learning video following the search tasks. The video portrayed the story of a woman who was the subject of a viral video in which she was accused of suing her nephew when an exuberant hug left her needing multiple surgeries. Dubbed the "Auntie Christ" she was mobbed online with accusations of being "human garbage" the result of which ruined her reputation online. In reality, the lawsuit was a formality in order for her to get her cousin's homeowner's insurance to pay her medical bills; there was no ill-will in the family. The story is a launching point for explaining that when you hear something sensational online, it's usually a good idea to stop, open a new tab, and do a new search about the source or claim, essentially teaching viewers how to engage in lateral reading.

When we asked respondents whether they had learned anything from the videos, participants distinctly described the phrase "lateral reading" and noted it was a useful phrase to capture the action, but simultaneously insisted that they already used those strategies (even after recently demonstrating that they do not). As the participant who used EPI's About Page to access their credibility noted when we asked if they had learned anything new: "Not really. They were already strategies that I tend to use anyway. So not really. I was encouraged to see that there was that type of information being relayed to the public, especially about checking various sources and not taking... Although, I already do it, I don't know how many people do."

While people came to the library for a variety of needs and sat down with us to conduct search tasks with a range of technical literacy, the search literacy patterns among patrons were remarkably consistent. Regardless of socioeconomic status or whether they had access to the internet at home, how they approached basic search tasks was similar. Nearly everyone trusted weak markers of credibility (e.g., domain extensions or website aesthetics) and stayed on the website to assess source trustworthiness. Moreover, they approached the search tasks like a diligent homework assignment, going deeper into the website provided (e.g., the “About” page) but rarely engaged in the fact-checking process of lateral reading. Along with making these assessments of patron search literacy, we also wanted to understand how well-equipped librarians felt for this task and if they would feel comfortable intervening in patrons’ search habits.

While our data is limited to residents of Montana and are not necessarily representative of the rest of the US population, it is clear that patrons access and use the library for a variety of reasons and that these needs must be centered into how librarians plan relevant programming and utilize their funding.

From Frontline Response to the Long Game of Improving Patrons’ Search Literacy

During our search tasks, we found that patrons in our study would benefit from educational interventions designed to improve search literacy. The librarians we interviewed agreed that search literacy education would be a good idea but were

not sure if patrons would attend classes or sessions since they noticed those who came to their library preferred librarians “do stuff for them.”

Part of this may be a lack of awareness for what a librarian does. As the reference librarian in the urban library we studied noted: “But they're not coming to me to ask really that often at all, ‘How do I do that? How do I research this?’ And I think that that's a distinct lack of understanding of that sort a librarian is truly there to help you do. ... [the perception is that] Google will get you everything I could do and you're doing it on your own. So I'm assuming there's an element of individuality or self-sufficiency or whatever, [patrons saying to themselves], ‘I can do everything...’.”

Librarians we interviewed were also hesitant to conduct a search literacy training if it was on a specific topic because they did not want to get too involved with patrons’ search needs. For example, the head librarian in the rural library we observed explained that librarians must strike a careful balance, noting that she would “shy away from medical or legal things in general because we [librarians] have to be so careful that whatever we say to our patrons isn’t considered as giving them advice on those things.” Another librarian at the urban site described the careful nature with which he treads when suggesting a patron do search a different way:

So immediately now, I'm knee deep in the mud of ideology and a potentially disruptive occurrence. And we do have disruptions that come out of thin air out of nothing. And all of a sudden you have somebody screaming their head off because of any number of reasons... just asking

like, "So why would you..." It can just set a lot of our patrons off. So that being said, what could I offer somebody who just wants to do their research on their own? I mean, it's so hard to... I mean, if they're happy with what they're doing, if they're getting the knowledge that they want, it's hard for me to say that they're not doing it the right way... And that's what I signed up to do. That's part of the gig. We take it very, very seriously.

This same librarian also explained how patrons do not usually come to them with information about personalized searches, especially when the topic involves highly politicized disinformation topics. In his words, "it's not like people come and ask me "So I was wondering if like, where can I buy apple-flavored Ivermectin. And is that better for you than the regular Ivermectin?"

Yet librarians also described a close connection to those they serve and were acutely aware of the role trust plays in combating misinformation. One librarian explained how in order to work with individuals on evaluating sources, you must first build an established level of trust, since often the searches patrons are performing are deeply private or tied to patrons' closely-held beliefs; the sources that one person might find "reliable" is inextricably linked to their ideological beliefs, experiences, and preexisting notions.

In my experience, you have to have some trust, a base level of trust with somebody if you want to persuade them of anything or change their mind, and especially in...As divided and defensive as people have become, it's really easy to just shut down somebody who comes along. Yeah. On

occasion, when I do, and I try not to... I make a real effort not to make the person feel stupid or anything, or say, "How can you believe that stuff? You're crazy," and just listen to them and say, "Okay. I've heard what you're saying now. Have you considered this or looked at this?" and things like that. Every now and then I get somebody to kind of, "Maybe." You know?

The librarians we interviewed helped us understand that the challenge of improving the public's search literacy is not simply imparting a set of computer skills, but building a trusting relationship with patrons to gently help them examine their ingrained search habits.

Our research demonstrates that librarians are well-positioned for delivering a range of search literacy education tools to patrons because they are embedded within communities, are trusted figures, and regularly assist with patrons' information needs. However, several of the librarians we interviewed talked about the need for them to refresh their own search skills. Some of their training had been based on outdated sources and techniques and so they felt that their "fact-checking habits are not necessarily that much better than the general public's." One librarian noted, "I took a class in my master's. We had to write about fake websites. I think a lot of the markers that we used to use to say this is fake, they're not accurate anymore."

Developing training resources for librarians is an immediate instructional need that has potential to reach a wide audience. If provided with high quality training opportunities, librarians would then be well-positioned to effectively

disseminate tools to patrons because they have intimate knowledge of patrons' diverse needs, and how best to communicate information to different patrons. Many librarians work closely with patrons in one-to-one consultations and therefore have a lot of experience tailoring their explanations to their audience. One librarian described his process for ensuring he was explaining a concept to patrons in a way that would resonate with them: "So there's feelings of what do you want? You try to get more and more. I'm thinking at this point that's probably too academic or that's probably too sophisticated. Let me see if I can bring it down to something in between, or let me just get you the bare nuts basic, Wikipedia or something like that. So that's a part of the dance."

As trusted messengers, librarians can help patrons reflect on pre-existing beliefs about what constitutes reliable information. At the same time, the librarians we spoke with expressed a tension or uncertainty about the limits of their role in interfering with patrons' searches which they explained can sometimes be deeply personal. While libraries and librarians represent a unique resource and opportunity as trusted, community-embedded organizations, there was also a hesitancy to take on the "frontline" role when it came to confronting disinformation head-on. This suggests that providing tools and training materials directly to libraries and librarians holds important promise. Rather than trying to turn a librarian into a fact-checker, we could help them empower their patrons to improve their own capabilities the public's collective search literacy.

Discussion and Future Work

Through ethnographic observations, in-depth interviews with librarians, search tasks with patrons, and usability testing of educational interventions, we learned that the informational needs of adult library patrons might not adequately predict (or prepare them) for searching for reliable information online. While a distinct digital divide was present among library patrons and that access largely shaped patrons' engagement with librarians and how they used their time at the library, a lack of high-speed internet access did not impact patrons' search literacy techniques. Instead of documenting a "second-level digital divide" (Hargittai 2002), we found that there were few differences in patrons' search practices across differing levels of information needs.

Regardless of socioeconomic status, most patrons carry with them many preconceived, and outdated, notions of how to verify source credibility online. During search-tasks, patrons treated source verification like an in-depth research task, but did so by reading vertically— staying on the website and taking time to read the about page, click on the sources provided within the site, and assess the aesthetic appeal and domain extension of the source. Antiquated search skills and misconceptions about how to evaluate a source's trustworthiness appear to stick well beyond formal education, and potentially, for life. However, this finding also suggests that educational interventions that have been uncommonly successful in improving students' digital savvy, hold promise for reaching adults outside of educational environments. Our team has started experimenting with creating different formats of learning materials for adults that highlight these evidenced-based search literacy skills. For example, in Figure 3 below, we provide a visual

summary of these skills that could be printed as a poster, put on a bookmark, or shared in an informational brochure.

We also found that many people who come to the library for high-speed internet come with their own devices and that because of limited broadband access information seekers from all walks of life are increasingly reliant on their mobile phones. Yet, adult learning settings are quite different from k-16 compulsory or elective contexts in ways that have important implications for the design of adult search literacy interventions. While some might use their laptop to go into depth on a subject, many get their news and information from a cell phone because mobile broadband is their most reliable access point. This finding suggests that more research is needed on the important role that mobile-first environments play in combating misinformation. While the same tools of lateral reading would remain in effect (i.e., get off the page and find another source), one cannot read “laterally” as easily on a vertically oriented screen with nested tab browsers. Based on this finding, our research team is looking to develop mobile-first search literacy approaches to lateral reading. For instance, we developed a 45- minute online course, *Secrets of Effective Search on Mobile Devices*, that uses a mobile-first learning management system to introduce patrons to lateral reading techniques on phones (Figure 4). We also developed a mobile game, *Bad Influence*, where patrons can practice search literacy skills by taking on the role of an assistant to a social media influencer with an unfortunate habit of posting falsehoods (Figure 5). These tools, along with the Retro Report videos, represent

a suite of tools and strategies to empower librarians to engage patrons in effective search practices.

Deep ethnographic research into patrons' informational needs can give instructional designers insight into issues that resonate with communities. The communities we visited are largely involved in farming and other trade businesses. Many of them use the internet for their work and are often required to compare goods and services across a range of providers (e.g., the organic chicken feed example above). In designing learning experiences, we can connect the importance of search literacy tasks to local examples that community members care about.

While the findings about adult library patrons' search literacy practices are based on one study sample in a specific geographic context, the replication of findings across sources and study sites supports the need for adult search literacy interventions. Future work could look toward other communities to determine how other geographic and cultural factors influence search literacy techniques and practices and compare those findings to this work. We are hopeful that insights gained about the information literacy needs of library patrons and the positioning of librarians as trusted messengers can serve as an important starting point for timely adult search literacy interventions. Given that misinformation campaigns have only increased in virulence during the global COVID-19 pandemic, and libraries have proven central to the pandemic response, librarians are extremely well positioned to serve a lead role in building a more resilient public by addressing widespread search mis-teachings of the K-16 school system. By

focusing on the intervention, rather than the information, libraries can create effective strategies for patrons to confront disinformation about this pandemic and those that arise in the future.

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Exhibit 1. Screenshot of website used in a search task about the reliability of a source on minimum wage: <https://epionline.org/minimum-wage/>

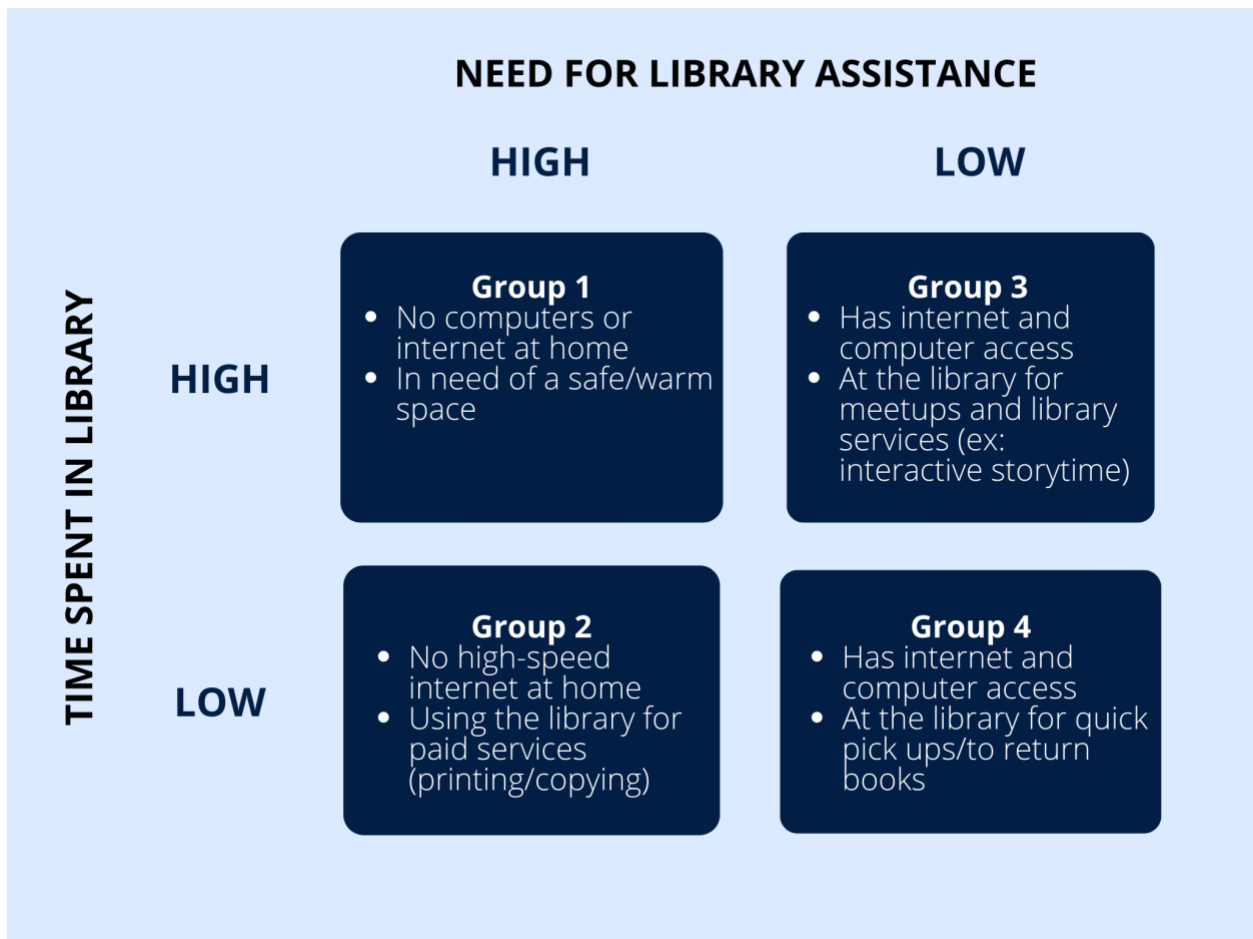



Exhibit 2. Summary of library patrons' time spent in library by need for assistance


Effective Search Tips

These tips will show you how to evaluate whether the information you find on the web is reliable.

Skills for Fact Checking

 **NOT Helpful**

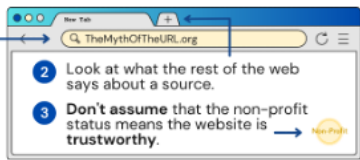
1. Focusing on a single page
2. Trusting our intelligence
3. Looking for familiar markers

 **Helpful**

1. Leaving page
2. Distrusting our intelligence
3. Turning to the web

Don't Rely on the URL

1. **Don't judge a site based solely on its dot-org or dot-com URL.** There are very reliable .com sites and very misleading .org sites.
2. Look at what the rest of the web says about a source.
3. **Don't assume** that the non-profit status means the website is **trustworthy.**




Don't Trust Appearances


Attractive websites can be full of disinformation, and plain websites can be accurate and helpful.

Don't assume that a polished website is a trustworthy website— look at what the rest of the web says about a source.

Use Wikipedia as a Starting Point



In our research, **the people who solved our search puzzles in the shortest time and with the greatest accuracy used Wikipedia regularly.**



For a quick check about the backgrounds of people and organizations, **Wikipedia can be a great starting place,** particularly the references at the end of the articles.

Exhibit 3. Poster summarizing effective search literacy skills.

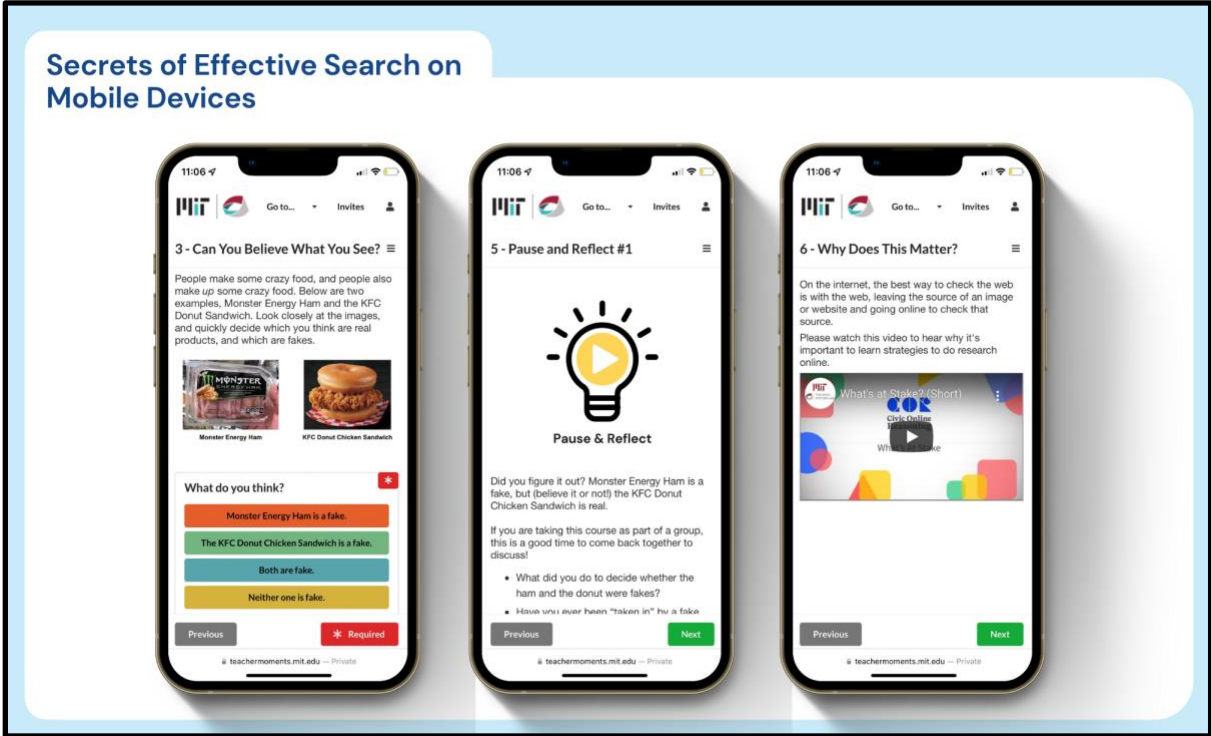


Exhibit 4: Screenshots from *Secrets of Effective Search on Mobile Devices*, an online mobile course.

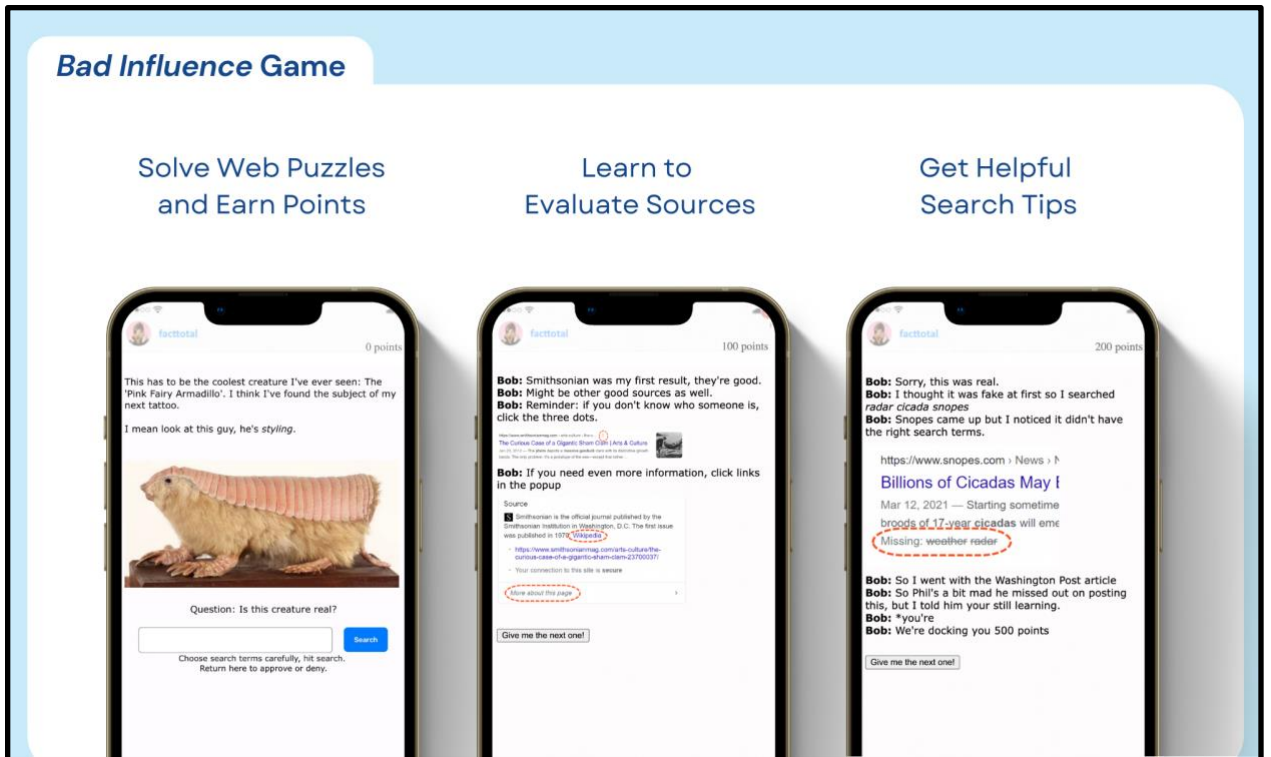


Exhibit 5: Screenshots from Bad Influence, a mobile game practicing effective search practices.