Lateral Reading and the Nature of Expertise:

Reading Less and Learning More When Evaluating Digital Information

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in Social Education.*

1 or 2 sentence description of article: This study compares how professional fact checkers,
historians, and first year college students evaluated online information and presents the strategies
fact checkers used to efficiently and effectively find trustworthy information.

Structured Abstract [200 to 400 words]

Background/Context: The Internet has democratized access to information but in so doing has opened the floodgates to misinformation, fake news, and rank propaganda masquerading as dispassionate analysis. Despite mounting attention to the problem of online misinformation and growing agreement that digital literacy efforts are important, prior research offers few concrete ideas about what skilled evaluations look like.

Purpose/Objective/Research Question/Focus of Study: Our purpose in this study was to seek out those who are skilled in online evaluations in order to understand how their strategies and approaches to evaluating digital content might inform educational efforts. We sampled 45 experienced users of the Internet: 10 Ph.D. historians, 10 professional fact checkers, and 25 Stanford University undergraduates. Analysis focused on the strategies participants used to evaluate online information and arrive at judgments of credibility.

Research Design: In this expert/novice study, participants thought aloud as they evaluated live websites and searched for information on social and political issues such as bullying, minimum wage, and teacher tenure. We analyze and present findings from three of the tasks participants completed.

Findings/Results: Historians and students often fell victim to easily manipulated features of websites, such as official-looking logos and domain names. They *read vertically*, staying within a website to evaluate its reliability. In contrast, fact checkers *read laterally,* leaving a site after a quick scan and opening up new browser tabs in order to judge the credibility of the original site. Compared to the other groups, fact checkers arrived at more warranted conclusions in a fraction of the time.

Conclusions/Recommendations: We draw on insights gleaned from the fact checkers' practices to examine current curricular approaches to teaching web credibility as well as to suggest alternatives.

Executive Summary

BACKGROUND

The Internet has democratized access to information but in so doing has opened the floodgates to misinformation, fake news, and rank propaganda masquerading as dispassionate analysis. Despite mounting attention to the problem of online misinformation and growing agreement that digital literacy efforts are important, prior research offers few concrete ideas about what skilled evaluations look like.

FOCUS

Our work focused on *civic online reasoning*, a subset of the broader fields of digital and media literacy, whose broad goals include everything from how to protect one's digital footprint to learning how to write code. We define *civic online reasoning* as the ability to search for, evaluate, and verify online information related to social and political issues; proficiency in online reasoning is necessary to become informed about the social and political choices citizens face.

RESEARCH QUESTIONS

Two questions guided our inquiry: How do experienced users of the Internet arrive at judgments of credibility as they evaluate unfamiliar sites and investigate questions of social and political import? And, what strategies and heuristics do they use to locate online information and establish its trustworthiness?

SAMPLE AND METHODS

We sampled 45 experienced users of the Internet: 10 Ph.D. historians, 10 professional fact checkers, and 25 Stanford University undergraduates. Historians were selected because prior research has documented their ability to interrogate sources to establish reliability and trustworthiness. Because much historical work still takes place with print sources, we also sampled professional fact checkers, whose work is done sitting before a computer screen. Finally, we recruited a group of talented undergraduates, who attend a university where technology startups sprout within campus labs and where computer science is the most popular major on campus. In live Internet sessions, participants completed a series of web-based tasks about issues such as minimum wage policy, school-based bullying, and teacher tenure. QuickTime Player was used for screen captures, recording all mouse movements, clicks, and websites visited. Using think-aloud methodology, participants verbalized their thoughts as they engaged in web searching.

RESULTS

Historians and students often fell victim to easily manipulated features of websites, such as official-looking logos and domain names. Fact checkers, on the other hand, engaged in three practices—*taking bearing, lateral reading* and *click restraint*—that allowed them to read less but learn more about the topics they investigated. To *take bearings,* searchers obeyed the following imperative: before diving deeply into unfamiliar content, chart a plan for moving forward. Rather than staying on a single website to evaluate its reliability, *lateral reading* involved leaving a site after a quick scan, opening up new browser tabs along the screen's horizontal axis to judge the credibility of the original site. *Click restraint* stands in contrast to whimsical clicking; before clicking on any one result, users evaluated the list of search results to understand the digital terrain in which they have landed. Only then did they initiate a search.

IMPLICATIONS

Civic online reasoning demands reading practices that differ from those developed to read traditional print sources. Staying on a single webpage and carefully parsing its content, before one has even established whether a site is what it says it is, is a woefully inefficient way to navigate treacherous digital territory. We need to teach students a set of flexible strategies that will eliminate some of their most common errors. Educators can begin this effort in a separate course on digital literacy, but the work cannot stop there. An age when information comes to us via a computer screen demands a fundamental reconsideration of how we teach *all* of the core school subjects.

The 2016 election cycle made it clear that more people are relying on the Internet for information—often with little idea about how to judge what they find there. Among the false stories that swirled during election season was "Pizzagate," which alleged that Hillary Clinton was involved in a child sex trafficking ring that operated from a pizza shop in Washington, DC Rumors spread on Facebook and Twitter; 4chan and Reddit users investigated purported "evidence" about the scandal; and websites like InfoWars and Breitbart ran lurid stories. The combination of purposeful and haphazard spread of mis- and disinformation resulted in real consequences: On December 4, 2016, Edgar Maddison Welch entered Comet Ping Pong restaurant to investigate and rescue the sex trafficking victims he expected to find. Police arrested him after he fired three rifle shots (Robb, 2017).

Educators and policy makers have responded to growing fears about online misinformation with a potential solution: media literacy. Four states have already passed laws mandating media literacy education, and other states are on their way (Foley, 2017). But even if states mandate media literacy, we still face a thorny problem— what, exactly, to teach.

There is no shortage of resources for instruction in how to evaluate online information. Most share something in common: they focus students' attention on a website's internal features. Was the site recently updated? Are there banner ads? Are the author's credentials provided? Is the language free of emotion? Yet, any organization with a competent web designer and a modicum of digital savvy can design a site that aces these questions, whether the organization is a trusted purveyor of information or not. Web development and design have outpaced our methods for evaluation (Wineburg, Breakstone, McGrew, & Ortega, 2016; Wineburg & McGrew, 2016). Despite mounting agreement that media literacy is important,

we have few concrete ideas about what skilled evaluations look like. Our purpose in this study

was to seek out those who are skilled in online evaluations in order to understand how their

approaches to evaluating digital content might inform educational efforts.

Students' Online Evaluations

Students often rely on the Internet for information about the world, but they struggle to

evaluate the information they find there (Bennett, 2012; Gasser, Cortesi, Malik, & Lee, 2012).

In one of the most extensive think-aloud studies to date, Hargittai, Fullerton, Menchen-

Trevino, and Thomas (2010) observed 102 college students as they searched online. Students

overwhelmingly ceded to Google the responsibility for determining the credibility of

information—the higher up a site ranked in Google's results, the more reliable students

considered it to be. Another study found that undergraduates ignored the valuable information

contained in Google's snippets (the few sentences accompanying each search result) and

clicked instead on websites in higher positions even when those websites were less relevant

(Pan et al., 2007).

Students do no better when they turn to evaluating websites. A study of nearly 8,000

responses to exercises about web credibility revealed widespread problems among middle

school, high school, and college students. Students could not distinguish between traditional

news and sponsored content (advertisements), they rarely evaluated sources (sponsoring

organizations or authors) and were instead swayed by content that appeared to present strong

evidence (in the form of photographs, data displays, etc.), and they judged websites based on

superficial features such as their graphic design or how authoritative their logo or references

made them seem (McGrew, Breakstone, Ortega, Smith, & Wineburg, 2018; Wineburg,

Breakstone, McGrew, & Ortega, 2016).

Wiley et al. (2009) found that college students rarely considered where information came from when evaluating reliability, a finding replicated across a range of studies and students of different ages and in different countries (e.g., Barzilai & Zohar, 2012; List, Grossnickle, & Alexander, 2016; Walraven, Brand-Gruwel & Boshuizen, 2009). Instead, young people judge a website based on its relevance to their searching needs (Iding, Crosby, Auernheimer, & Klemm, 2009; Julien & Barker, 2009; Walraven et al., 2009) and its appearance (Agosto, 2002; Barzilai & Zohar, 2012).

Extant research suggests that young people struggle with many aspects of finding information online—from selecting search results to judging whether a site is trustworthy. What, then, might a more sophisticated approach look like?

Frameworks of Credibility

Since the early days of the web, scholars have created models for how people search for and evaluate information. Two early frameworks posited that prominence of information (how likely information was to be noticed) played a primary role in users' evaluations. Information foraging theory (Pirolli & Card, 1995) argued that people who search for information are like animals searching for their next source of food. Information's prominence (i.e., its placement and accessibility) and its relevance (how closely digital content matches what the user is searching for) drive decisions about whether to use it. Fogg's (2003) prominence-interpretation theory extended the importance of prominence to judgments of websites themselves: Fogg argued that evaluations could be explained based on whether a user noticed an element of a website (due to its prominence) and what judgment the user made based on that element (interpretation).

Subsequent frameworks argued that users base evaluations on surface features, such as length, references, and writing style (Lucassen & Schraagen, 2011) or genre and level of familiarity (Hilligoss & Rieh, 2008). Users also judge the actual contents of the information; they leverage their knowledge of the topic to check whether it is accurate and relevant to their needs. Finally, users judge the credibility of the source itself, deciding whether the source has expertise and is trustworthy (Hilligoss & Rieh, 2008; Lucassen & Schraagen, 2011; Wathen & Burkell, 2002). Whether the provider of information is deemed reliable is not necessarily more important than other considerations in these models.

Conceptualizing Expertise in Civic Online Reasoning

These models of credibility judgments share one major shortcoming: They describe what average users do instead of investigating expert practice. Studies of what *skilled* users do are less common. Lucassen and Schraagen (2011) studied people active on a car enthusiasts' forum as a proxy for expert knowledge about car engines. Unsurprisingly, people who knew more about cars were better able to detect errors in Wikipedia than those who knew less. Similarly, a group of Dutch researchers compared psychology students and psychology faculty as they selected online sources on psychological topics; faculty spent more time scanning search results while students made more superficial evaluations (Brand-Gruwel, Kammerer, van Meeuwen, & van Gog, 2017). In another study, researchers designated a group of graduate students in educational technology as "experts" and compared their online research processes with those of university freshmen ("novices") (Brand-Gruwel, Wopereis, & Vermetten, 2005). But the authors provided few clues about how experts went about selecting and evaluating information.

We set out to purposefully sample skilled Internet users as they evaluated digital sources about social and political issues. The Internet is reshaping participatory politics, changing how we learn about politics, communicate with our representatives in government, and organize political protests. In response, civic education should, among other goals, prepare students to "analyze and evaluate information in order to learn about and investigate pressing civic and political issues" (Kahne, Hodgin, & Eidman-Aadahl, 2016, p. 9). *Civic online reasoning* (McGrew, Breakstone, Ortega, Smith, & Wineburg, 2018) encompasses the ability to effectively search for, evaluate, and verify social and political information online; proficiency in online reasoning is necessary for citizens to use the Internet to inform their social and political choices. Civic online reasoning can be considered a subset of the wider fields of digital and media literacy, whose sweeping goals can include everything from how to protect one's online identity to learning to code or produce digital videos (e.g., Common Sense Media, n.d.; Mozilla, n.d., National Association for Media Literacy Education, 2007).

The present work set out to understand in greater detail what experts do when judging social and political information online. Before we could tackle this issue, we needed to figure out who qualified as an expert.

We turned to a group of professionals who evaluate sources for a living: historians. Ample research has established how historians *source* documents, interrogating a document's author and the circumstances of its creation as keys to determining its trustworthiness (Leinhardt & Young, 1996; Shanahan & Shanahan, 2008; Wineburg, 1991, 1998). Shanahan, Shanahan, and Misischia (2011) found wide variations in sourcing among academics from different fields. While mathematicians explicitly ignored the author of a paper, as it "would only be a distraction

and could help in no way with the process of making sense of the text," historians engaged in "extensive sourcing," speculating about "who the author was and what he or she represented" (2011, pp. 408-409).

 Despite the growth of digital history, the majority of historians still conduct their research in archives of print documents (Dougherty & Nawrotzki, 2013). We thus set out to study a second group whose work is largely done on a computer screen: fact checkers, whose job it is to ascertain truth in digital form. These professionals are charged with evaluating claims and evidence and spend much of their time vetting digital information.

 Finally, we recruited a third group: undergraduates at Stanford University. In 2016, Stanford rejected 95% of its applicants, making it the most competitive university in the United States (Anderson, 2016). Nearly all admitted students were in the top 10% of their high school classes and scored above the 90th percentile on the SAT (Stanford University, 2015). These young people attended a university in the heart of Silicon Valley, where technology startups sprout within campus labs and where computer science is the most popular major (Stanford University, 2017). These students are earmarked—at least according to Stanford University brochures—to lead the digital future.

Method

 The purpose of this study was to investigate how experienced Internet users arrive at judgments of trustworthiness. We asked two main research questions: How do experienced users of the Internet arrive at judgments of credibility as they evaluate unfamiliar sites and investigate questions of social and political import? What strategies or heuristics do they use to efficiently find reliable information? Based on other expert/novice research (Ericsson, Chraness, Feltovich,

& Hoffman, 2006), our hope in studying expertise was to distill a set of practices that can inform the development of curricula and assessment.

Participants

Historians. Ten historians were recruited; all held a Ph.D. in history and were faculty at five different four-year colleges and universities in California and Washington state. Six were male; four were female. Their ages ranged from 39 to 69 ($M = 47$). [insert Footnote 1 here]

Fact Checkers. The fact checkers were all employed at well-regarded news and political fact-checking organizations. Eight were located in New York City or Washington, DC; two were based on the West Coast. As with the historians, six were male and four female. Ages ranged from 23 to 60 ($M = 34$). Two participants held master's degrees while one held a Ph.D.; the rest had bachelor's degrees.

College Students. Students were recruited using fliers posted on the Stanford campus. Each received a $25 Amazon gift card for participating. All students were enrolled in the second or third quarter of their first year and were between the ages of 18 and 19; 11 identified as male, 13 as female, and one as non-binary. Every student reported spending at least four hours online each day.

Protocol

We developed a set of six online tasks that took approximately 45 minutes to complete. Our focus was on evaluating digital sources that addressed social and political issues. Space limitations require that we narrow our discussion here to three of the main tasks participants completed (see Table 1). [insert Footnote 2]

Table 1

Main Web Evaluations

Topic	Processes Elicited	Participants could
Bullying in schools URLs: https://www.acpeds.org/the-college-speaks/position-statements/societal-issues/bullying-at-school-never-acceptable https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/Stigma-At-the-Root-of-Ostracism-and-Bullying.aspx	Evaluations internal and external to a site; comparing sites	Scroll, click on links, and leave the site to access any information online Time Limit: 10 minutes
Minimum wage policy URL:https://www.minimumwage.com/2014/10/denmarks-dollar-forty-one-menu/	Evaluations internal and external to a site	Scroll, click on links, and leave the site to access any information online Time Limit: 5 minutes
Teacher tenure: Funding for plaintiffs in *Vergara v. California*	Open web search to find out who paid for the $1.2 million legal fees	Access any information online Time Limit: 5 minutes

Procedure

Sessions with historians and fact checkers were conducted by the authors; sessions with students were conducted by one of the authors and other members of the research team. Participants were asked to complete a series of web-based tasks on a 13-inch MacBook Air. Websites were live, and participants were able to search the Internet as they normally do—clicking on links, opening new tabs, and leaving a site to search elsewhere. We employed a think-aloud methodology (Ericsson & Simon, 1993; Pressley & Afflerbach, 1995) that has been used to understand the nature of expertise in a wide variety of fields, including the thought processes of literary critics (Warren, 2011), mathematicians (Shanahan & Shanahan, 2008), historians (Wineburg, 1991), and physicians making clinical judgements (Elstein, Kagan, Shulman, Jason, & Loupe, 1972). At the beginning of the interview, the think-aloud procedure was explained: participants were told to say everything that came to mind as they completed the tasks. After introducing each task, we refrained from speaking unless the participant fell completely silent. In that case, questions like, "What are you thinking?" were used to encourage participants to verbalize their thoughts. Meta-analyses of think-aloud protocols show that they do not cause extensive disruption in the kinds of thought processes in which participants engage (Taylor & Dionne, 2000).

QuickTime Player version 10 was used to record audio and to capture video of the computer screen. QuickTime video-recorded all action on the screen, from scrolling movements to clicks, while simultaneously recording sound. We also used an iPhone 6 as a backup source of audio in case parts of the QuickTime sound files were muffled.

Participants were encouraged to do what they normally would when evaluating

information and determining its trustworthiness. We used a variety of prompts to encourage natural behavior, including: "You can open up new tabs—do whatever you normally would to learn about a site" and "We're interested in your take. You can stay on the page or go out to another website, anything you would normally do." We repeated these instructions at the beginning of each task. We also noted the time limit for each task and gave participants a one-minute warning before time was up.

Data Analysis

We developed rubrics to rate the quality of participants' conclusions for each task. These rubrics were developed after extensive pilot testing with Ph.D. graduate students and university professors (we describe these rubrics in greater detail in subsequent sections that describe each task).

In addition to assigning rubric scores, we developed codes specific to each task (discussed in greater detail in Findings). We independently analyzed 10% of the data corpus, met to discuss coding and resolve inconsistencies, and updated the coding scheme. One rater (the second author) then coded the remainder of the protocols. A second coder who did not participate in the creation of the rubrics or coding scheme analyzed a random sample of 10 protocols (22% of the data corpus); interrater agreement was 92% across the three tasks (Cohen's *Kappa* = 0.90).

Additional analyses varied by task. These included tracking the time participants took to settle on a conclusion; whether they stayed on or left a site, and, if they left, which other sites they visited; and whether they took steps to find out more about the individuals or groups behind the sites they consulted.

Results

Task 1: Bullying

Participants evaluated articles about bullying on the websites of the American Academy of Pediatrics ("the Academy") and the American College of Pediatricians ("the College"). Despite the similarity in names, the two organizations could not be more different.

The Academy. Established in 1932, the Academy is the largest professional organization of pediatricians in the world, with 66,000 members and a paid staff of 450. The Academy publishes *Pediatrics*, the field's flagship journal, and offers continuing education on everything from Sudden Infant Death Syndrome to the importance of wearing bicycle helmets during adolescence.

The website of the Academy bears a logo and trademarked motto. Resources and professional education opportunities for members are featured, including details on membership, the group's history since its founding in 1930, and opportunities to browse books and journals that the Academy publishes. Participants viewed an article on the Academy website entitled "Stigma: At the Root of Ostracism and Bullying." The article describes a symposium in which six papers were presented, including "Discrimination and Stigmatization of Non-heterosexual Children and Youth." Additional presentations focused on factors that might place youth at risk for bullying, such as weight, sexual orientation, race, and income (American Academy of Pediatrics, 2014).

The College. By comparison, the College is a splinter group that in 2002 broke from the Academy over the issue of adoption by same-sex couples. It is estimated to have between 200-500 members, one full-time employee, and publishes no journal (Throckmorton, 2011). The group has come under withering criticism for its virulently anti-gay stance, its advocacy of

"reparative therapy" (currently outlawed for minors in thirteen U.S. states), and incendiary posts such as one that advocates adding P for pedophile to the acronym LGBT, because pedophilia, they claim, is "intrinsically woven into [the LGBT] agenda" (American College of Pediatricians, 2015). The Southern Poverty Law Center has labeled the College a hate group that is "deceptively named" and acts to "vilify gay people" (Lenz, 2012; Southern Poverty Law Center, 2016). The College's portrayal of research findings on LGBT youth has provoked the ire of the nation's leading scientists, including Francis Collins, MD, the former director of National Institutes of Health, who wrote that "the American College of Pediatricians pulled language out of context from a book I wrote . . . to support an ideology that can cause unnecessary anguish and encourage prejudice. The information they present is misleading and incorrect" (as cited in Bradshaw, Weight, & Packard, March 3, 2011). [insert Footnote 3]

At the same time, a quick glance at the College's site might lead one to conclude that it is a politically neutral medical organization (Turban, 2017). The website bears an official-looking logo and sports the motto "Best for Children." An anodyne "About Us" page informs the reader that the College "produce[s] sound policy, based upon the best available research, to assist parents and to influence society in the endeavor of childrearing." However, a closer look shows that the College does not mask its positions. The "Mission of the College" states: "We recognize the basic father-mother family unit, within the context of marriage, to be the optimal setting for childhood development." The College's "Position Statements" are transparent on issues ranging from abortion (prematurely and unnecessarily ending a human life) to corporal punishment (effective under certain circumstances).

Participants began by evaluating an article on the College website entitled "Bullying at School: Never Acceptable," where a section labeled "Prevention" advises schools to refrain

from recognizing any students as particularly at risk of being bullied:

> By focusing a program upon the special characteristic or activity of one student or
> group, the school opens the floodgates for other programs promoted by its advocates,
> i.e. over issues involving religion, ethnicity, stature, intelligence, race, or even athletic
> abilities. By focusing anti-bullying programs, instead, on the topic of *general*
> respectfulness, the school…avoids the pitfalls of calling undue attention to a particular
> group or perhaps venturing into controversial teachings. (Trumbull, 2013)

Many studies have shown that students who identify as LGBT are more likely to be bullied than their heterosexual peers—over 80% of LGBT students were "verbally harassed" and over 40% were "physically harassed at school…because of their sexual orientation," according to a study cited in the White House Conference on Bullying (Espelage, 2011, p. 65). Yet, the College implies that programs to reduce bullying against LGBT students amount to "special treatment," and that these programs may "validat[e] individuals displaying temporary behaviors or orientations" (Trumbull, 2013).

Participants were given up to five minutes per site to evaluate the trustworthiness of each as a source of information about bullying. If they did not explicitly compare the two sites before the ten minutes were up, we asked: "If you had to say which website was more reliable and which was less reliable, what would you say?"

We developed a rubric to characterize the quality of the conclusions participants reached: we awarded two points for specific, correct, and warranted descriptions of the sites. Such answers concluded that the Academy is the main professional organization and the College is a small splinter group, which was formed because of ideological disagreements with its parent

organization. We awarded one point for vague or indecisive evaluations, and zero points when

participants reached wrong conclusions (such as equating both organizations in terms of

trustworthiness).

For the College website, a Kruskal-Wallis nonparametric analysis of variance

indicated significant differences in the conclusions reached by participants on the College

website: fact checkers had a perfect mean score of 2 ($SD = 0$); historians, 0.7 ($SD = 0.95$); and

students, .16 ($SD = 0.37$) (H (2) corrected for ties = 27.5, $p < .001$). Follow-up Mann-Whitney

U tests showed significant differences between fact checkers and historians ($p = .003$) and fact

checkers and students ($p < .001$).

There were also significant differences in the quality of conclusion scores for the

Academy site (H (2) corrected for ties = 25.2; $p < .001$). Fact checkers again had a perfect

score ($M = 2$, $SD = 0$), historians a 1.2 ($SD = 0.79$), and students a 0.4 ($SD = 0.58$). Follow-up

Mann-Whitney U tests yielded significant differences between fact checkers and historians (p

$= .01$), fact checkers and students ($p < .001$), and historians and students ($p = .007$).

There were striking differences in which site participants judged the most reliable.

Every fact checker unreservedly viewed the Academy's site as the more reliable; historians

often equivocated, expressing the belief that both sites were reliable; and students

overwhelmingly judged the College's site the more reliable (see Figure 1).

Figure 1. Percentage of participants in each group selecting the College or the Academy as more reliable.
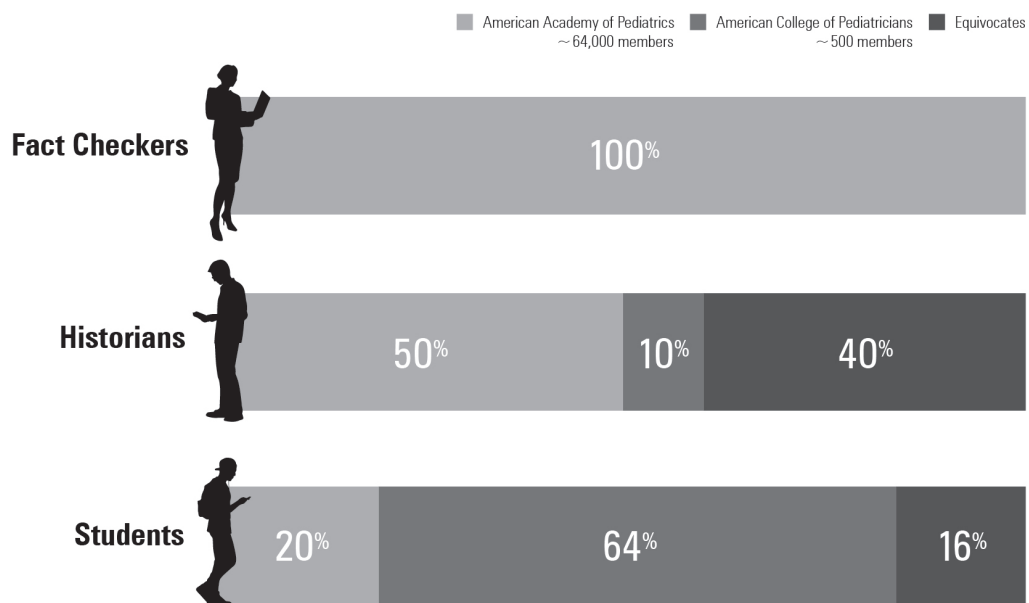
Taking Bearings. Fact checkers' success was closely tied to what we think of as *taking bearings,* a concept borrowed from the world of navigation. Exploring an unfamiliar forest, experienced hikers know how easy it is to lose their way. Only foolhardy hikers trust their instincts and go traipsing off. Instead they rotate their compass's bezel to determine *bearings*—the angle, measured in degrees, between North and their desired destination. Obviously, taking bearings on the web is not as precise as measuring an angle in degrees. It begins, however, with a similar premise: When navigating unfamiliar terrain, first gain a sense of direction.

Checker C's approach exemplified the advantages of taking bearings. He spent a mere eight seconds on the College's landing page before going elsewhere. "The first thing I would do is see if I can find anything on the organization," he said as he typed the organization's name into Google. He clicked on Wikipedia's entry about the College and read that it is a "socially conservative association of pediatricians…founded in 2002…as a protest against the [American Academy's] support for adoption by gay couples." Wikipedia's entry linked to sources including a *Boston Globe* story ("Beliefs drive research agenda of new think tanks," Kranish, 2005), a report from the Southern Poverty Law Center ("American College of Pediatricians Defames Gays and Lesbians in the Name of Protecting Children," Lenz, 2012), and a brief from the American Civil Liberties Union ("Misinformation from Doctors . . . Out to Hurt Students?," Coleman, 2010).

It was a full minute and twenty seconds before Checker C returned to the College's article on bullying. Reading the abstract that he had glanced at in the task's opening seconds (see Figure 2), he paused at the phrase "no group should be singled out," and remarked that

this is "often code for, you know, kids who are more likely to be bullied—students of color or gay or queer children," adding, "That's the kind of thing that I never would have known if I had just looked at [the article on bullying]."

Figure 2. Abstract of "Bullying at School: Never Acceptable" (emphasis added).
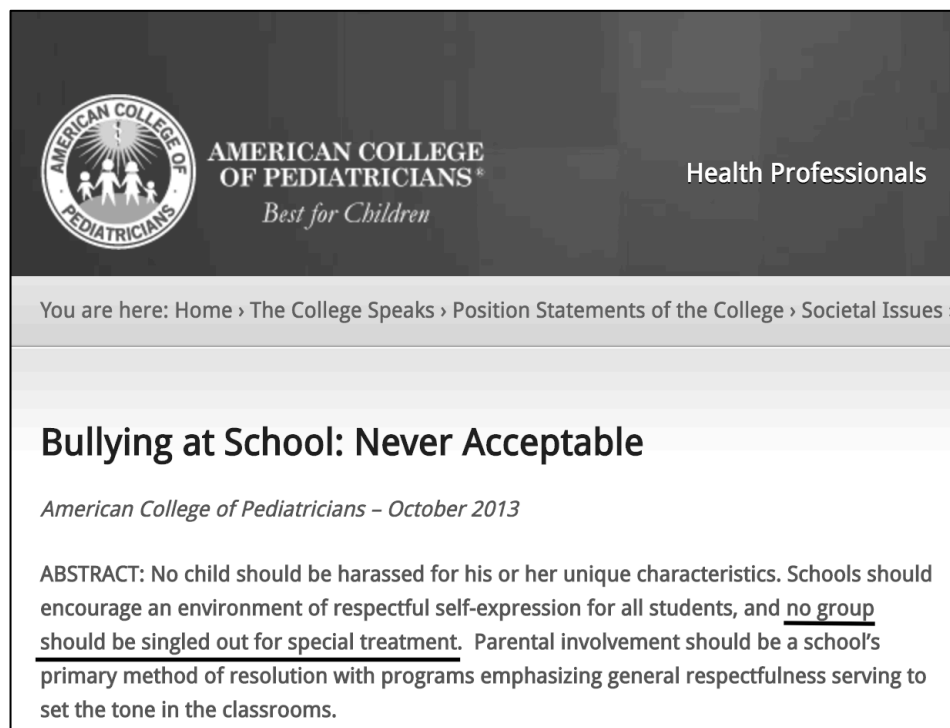
Rendered in under two minutes, Checker C's conclusion was not only an accurate evaluation of the bullying article but also of the rest of the College's website, which presents an anti-gay stance throughout. [insert Footnote 4] Overall, fact checkers left the landing page of the College in about half a minute ($M = 32$ s, $SD = 29$ s). In contrast, historians took almost three times as long ($M = 88$ s, $SD = 103$ s) (eight of the 10 left the landing page; two did not). The 16 students who left the landing page (nine never did) took an average of 100 seconds ($SD = 52$ s).

Fact checkers' comments as they left the landing page (see Table 2) showed an immediate impulse to take bearings. They understood the web as a maze filled with trap doors and blind alleys, where things are not always what they seem. Their stance toward the

unfamiliar was cautious: while things *may* be as they seem, in the words of Checker D, "I

always want to make sure."

Table 2

Examples of Fact Checkers' Comments Upon Leaving the Landing Page

Checker	Comment
A	"I immediately want to know more about [the College]. So I'm going to go to About Us."
D	"My first move to figure out whether something is reliable is to click on the About Us page. . . . At face, the American College of Pediatricians sounds pretty formal, but I always want to make sure."
E	"I want to learn a lot more about the American College of Pediatricians."
H	"It's kind of hard to tell how mainstream this organization is, so I might open another tab just to read a little bit more about, if this is the main American pediatricians' professional organization or if this is a splinter group for some reason."

Historians' Reading. Two of ten historians resembled fact checkers in how they took bearings. Leaving the landing page after a 20-second glance, Historian H opened the site's "Resources" tab and clicked on the link to focusonthefamily.com to confirm that it was in fact the organization founded by evangelist Dr. James Dobson. He returned to the College's "Resources" page with a hypothesis: "They probably have an agenda to quote, cure, unquote homosexuality, which is another fundamentalist point of view." Historian S also left the College's site in less than half a minute. Googling the organization's name, he clicked on a *Breitbart* headline, "American College of Pediatricians on Same-Sex Marriage Ruling: A Tragic Day for America's Children." He concluded that the College is "a heavily ideological site."

Historians H and S were the exceptions. Asked whether the website of the splinter group or the 64,000-member Academy was the more trustworthy site, five of their colleagues equivocated. Seven of the historians never took bearings; one did so only after analyzing the bullying article for four minutes. After ten minutes of review, most scholars had learned virtually nothing about the respective agendas of the two pediatrics organizations.

Historians were often taken in by the College's name and logo; its .org domain; its layout and aesthetics; and its "scientific" appearance, complete with abstract, references, and articles authored by medical doctors. Reading the "Bullying at School" article, Historian M commented on the presence of a scientific abstract and references, compared the site to WebMD, and noted that the article was signed by a doctor (true, but it was not something she verified, since she never left the landing page). She concluded:

I think I would probably find this pretty reliable on the basis that it's written by an

expert, it's citing expert opinions, it's been reviewed by at least some people from the

College of Pediatricians, so it agrees with an expert opinion. But it is still nonetheless

still an opinion piece, it's just an opinion piece that I agree with, and…reflects the

opinion of a group that I want to know the opinion of.

There was no basis for Historian M's far-reaching conclusions other than the surface features

of the site, its presentation of information, and the M.D. listed after the author's name.

One feature played a key role in shaping historians' judgment: the presence of

references at the bottom of the College's entry. Seven of 10 historians explicitly commented

on them (see Table 3), viewing citations to *Pediatrics* and the *Journal of Criminology*, among

others, as conferring legitimacy on the article's content.

Table 3

Historians' Comments About References

Historian	Comment
A	"It has references to kind of standard scientific literature, of backing up some of its claims so it has a kind of authoritative tone to it."
B	"I would look at the references and see who the [author] is citing."
E	"These are all references to professional journals so that definitely reinforces my sense that it's a genuine site and that the information found here can be trusted."
I	"I am looking at some of the footnotes and they all seem like perfectly credible sources. . . . I can trust this site."
K	"Who are they actually citing? So *Pediatrics*, okay, so they're citing real journals so I trust them a little bit more. . . . So the citations suggest that it has some reputable characteristics."
L	"I like to look at the sources to see where they are getting things. These are all academic journals as opposed to random Google News, which you never know about."
N	"I am looking at the references now and to what extent they're linked up to journals that strike me as peer-reviewed journals and have some kind of credibility. So, they all seem to come from something that strikes me—I don't know, *Pediatrics*—but I assume it seems to be in some kind of academic form."

[a]Not all references were to scientific articles. Among the 10 references, one was to Free Dictionary, two to Yahoo News blogs, one to Alliance Defense Fund, and the rest to refereed journal articles.

Students' Reading. By the end of ten minutes, only three of the 25 students had distinguished between the stances of the College and the Academy. Fully 60% of students chose the College as the *more* reliable site. Even the five who favored the Academy learned little about the vast differences between the two organizations.

Students rarely took bearings when landing on an unfamiliar site. Nine of the 25 never left the original site; those who did tended to click on links that spoke to a personal interest rather than a search designed to find out more about the organization behind the website. Student 19, who planned to major in either ancient Greek or bioengineering, based her evaluation almost exclusively on features like the organization's name ("sounds pretty legitimate"); the site's layout, which included bullet points ("nice to understand quickly") and section headings ("that's really smart"); and the absence of banner ads ("makes you focus on the article"). On the basis of graphic design, she concluded that the College's page was the more reliable of the two: "What struck me was how [the College's site] was laid out." Student 19's approach was representative of how the majority of students conducted their evaluations (see Table 4).

Table 4

Students' Comments About Why They Trusted the College's Webpage

Reason for conferring trustworthiness	Examples of Reasoning
Scientific Presentation: abstract, references, authored by a medical doctor	"This seems like it'll be pretty promising. There's an abstract, so I feel like this is like a research thing." (Student 12) "So now I see an abstract, which makes me think that this is a very research-based paper. . . . This seems like a very scientific article, because everything is in list form and very specific. The diction and the language is pretty scientific in general. I like that they are citing their sources with links and stuff." (Student 15) "It's written by a doctor. . . . There're references. Seems like a legitimate article." (Student 20)
Usefulness: amount of information, clarity and accessibility of article	"It has a very clear title on what its view of bullying is. . . . I really like how it's laid out with the little headings to easily find what you need, and bullet points are always easier to look through also. And the references are really useful if I were to be doing research project, because then I could just look at these references afterwards. Yeah, I think this would be a useful site. It does seem like they have a lot of information." (Student 13) "If I were writing a paper…then I would choose [the College] over [the Academy] simply because this just provides more information relevant to the topic." (Student 6) *Answering which is more reliable after looking at both sites:* "The [College article] because that actually gave me more information about bullying." (Student 11)
Graphic design: pleasant layout, color scheme, lack of advertisements	"They seemed equally reliable to me. I enjoyed the interface of the [College website] better. But they seemed equally reliable. They're both from academies or institutions that deal with this stuff every day." (Student 5) "Nice how there's not really any advertisements on this site. Makes it seem much more legitimate." (Student 19)
Organization's Apparent Authority: name, logo, URL	"I can automatically see this source and trust it just because of how official it looks—American College of Pediatricians, even the font and the way the logo looks makes me think this is a mind hive that compiled this." (Student 7) *First statement on arriving at the site:* "American College of Pediatricians. Seems like a credible website, run by pediatricians."

(Student 16)

First statement on arriving at the site: ".org. So this looks like it might have been subsidized by a government agency." (Student 18)

Three of the 25 students selected the Academy as more trustworthy because they learned something about, and rejected, the College's ideological stance. Two of the three stumbled upon information that provided insight into the College's views, but did not deliberately seek it out. Only one in 25 students took bearings in a way that could be compared to the fact checkers' approach. Even then, the student spent nearly four minutes reading "Bullying at School: Never Acceptable" before leaving the site.

Task 2: Minimum Wage

Participants evaluated an article entitled "Denmark's Dollar Forty-One Menu" on the website minimumwage.com (see Figure 3). The article argues that if the U.S. followed the example of Denmark and raised wages, it would face higher food prices and diminished job opportunities. The article links to stories in the *New York Times* and *Columbia Journalism Review*, while the website includes tabs for research reports and news stories. Its "About" page says it is a project of the Employment Policies Institute (EPI), a group described as a "nonprofit research organization . . . . [that] sponsors nonpartisan research which is conducted by independent economists at major universities."

Figure 3. "Denmark's Dollar Forty-One Menu" on minimumwage.com.

Despite their nonpartisan declarations, minimumwage.com and the Employment

Policies Institute are cloaked websites (Daniels, 2009). They are the handiwork of Berman and

Company, a Washington, DC-based public relations firm that lobbies on behalf of the

restaurant and hotel industries. Berman's specialty, in the words of the *New York Times,* is to

create "official-sounding nonprofit groups to disseminate information on behalf of corporate

clients" (Lipton, 2014). None of this information, however, is disclosed on

minimumwage.com or the Employment Policies Institute website. A 2013 *Salon* article

characterized the tactics of Berman and Company with the headline, "Industry P.R. Firm

Poses as Think Tank" (Graves, 2013).

Participants were given up to five minutes to evaluate minimumwage.com. They could

use any Internet resources (including leaving the site) to help them; we repeated the

instructions to do what "they would normally do" when landing on an unfamiliar site.

Participants who had not reached the Employment Policies Institute website after five minutes

were given this prompt: "Minimumwage.com is paid for by another person or organization.

Spend up to three minutes to figure out who is behind this site."

We used the following rubric to rate participants' responses:

| Score	Description
0	Evaluates minimumwage.com based on surface features; does not identify connection to the Employment Policies Institute.
1	Determines that the Employment Policies Institute sponsors minimumwage.com, but learns nothing about the Employment Policies Institute.
2	Determines that the Employment Policies Institute sponsors minimumwage.com; describes the Employment Policies Institute as a non-profit and non-partisan think tank or research organization.
3	Determines that the Employment Policies Institute sponsors minimumwage.com; describes the Employment Policies Institute as an advocacy organization or raises substantial questions/concerns about its trustworthiness.
4	Determines that the Employment Policies Institute sponsors minimumwage.com

and is a front site created by Berman and Company, a public relations firm.

There were dramatic differences in what fact checkers, historians, and students learned during the task's eight minutes. Before prompting, fact checkers' conclusions averaged 3.3 (SD = .82) out of 4, versus historians' average of 1.3 (SD = 1.4) and students' .52 (SD = 1.16). A Kruskal-Wallis test showed significance (H (2) corrected for ties = 21.4, p < .001); follow-up Mann-Whitney U tests showed differences among fact checkers and historians (p = .003) and fact checkers and students (p < .001).

Without prompting, and in less than a minute, the fact checkers learned that EPI was minimumwage.com's parent (See Figure 4; M = 51 s, SD = 43 s). Historians took nearly four times as long (M = 3 min, 40 s, SD = 2 min). Six of the 10 needed to be prompted to find EPI. Among the three groups, students took the longest to get to EPI: an average of 5 minutes and 18 seconds (SD = 1 min, 24 s); the overwhelming majority of students (four-fifths) needed prompting.

Every fact checker concluded that Richard Berman (or Berman and Company) sponsored EPI and minimumwage.com. Only six historians did so, and those who did took nearly twice the time as checkers ($M_{checkers}$ = 3 m, 25 s, SD = 1 min, 42 s; $M_{historians}$ = 6 m, SD = 2 min, 35 s). Only forty percent of students made it to Berman and Company; those that did took an average of nearly seven minutes (M = 6 min, 59 s, SD = 1 min, 51 s).

Figure 4. Average time for participants to determine Employment Policies Institute's sponsorship of minimuwage.com; average time and percentage of each participant group to determine Richard Berman or Berman and Company's sponsorship of both websites.
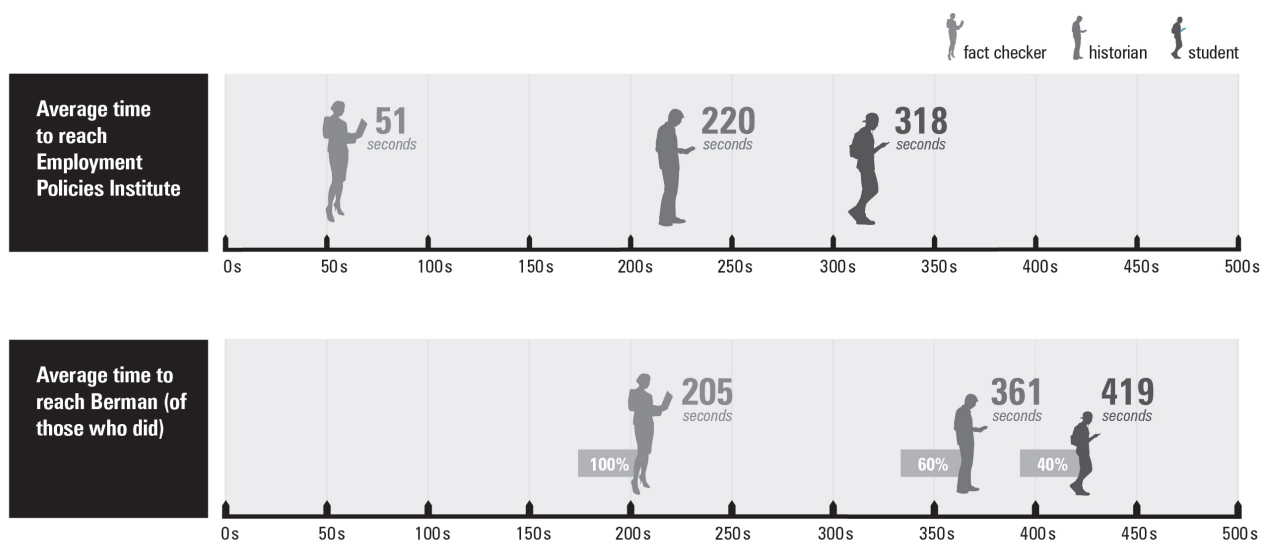
Reading Laterally. Fact checkers learned more about minimumwage.com and did so in less time than the others. They employed a powerful heuristic for taking bearings: *lateral reading*. Fact checkers almost immediately opened up a series of new tabs on the horizontal axis of their browsers before fully reading the article.

Checker A glanced at "Denmark's Dollar Forty-One Menu" for six seconds before clicking on the page's "About" tab, where she learned that the site was "a project of the Employment Policies Institute." She used keyboard shortcuts (pressing the command key while clicking) to open the link to the Employment Policies Institute site in a new tab alongside minimumwage.com (see Figure 5). After just three seconds on EPI's home page, she went to their "About Us," scanned the bland description ("Founded in 1991, the Employment Policies Institute is a non-profit research organization dedicated to studying public policy issues"), and quipped, "This is profoundly *not* helpful." In just over a half minute, she opened a new tab and searched for Employment Policies Institute.

Figure 5. Checker A's lateral reading.
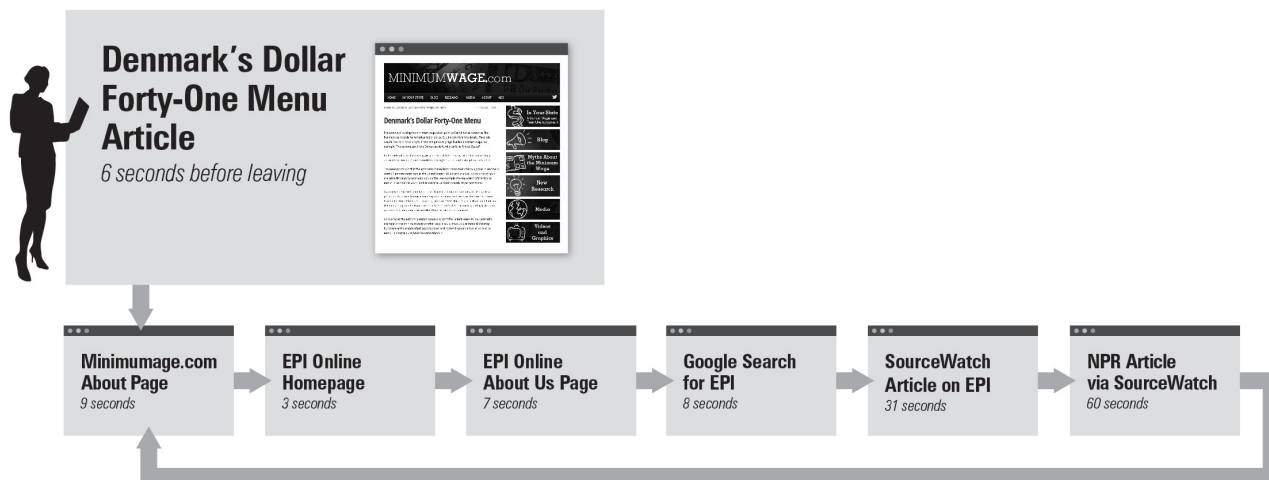
Scanning Google's snippets, Checker A skipped the first four results and selected

SourceWatch's entry on EPI: "So this says it's one of several front groups created by a PR

firm." She scrolled until she hit a linked quotation from a *New York Times* reporter who

"detailed his visit to the EPI, saying, 'I didn't see any evidence at all that there was an

Employment Policies Institute office.'" One minute and twenty-seven seconds into the task,

she clicked on SourceWatch's citation for this quote, which led to a *National Public Radio*

story, "A Closer Look at How Corporations Influence Congress." Rather than reading it,

Checker A used Command-F to search for EPI and corroborate the claims made by

SourceWatch. A little over two minutes into the task, she had EPI sized up:

> Obviously this isn't a legitimate organization, based on the reporting of this *New York*
>
> *Times* reporter. He talks about actually going there, he doesn't see any evidence at all
>
> that they actually had an office, there are no employees, all the staff there actually
>
> work for the PR firm.

Only then did she return to her original starting place, minimumwage.com, declaring, "[The

New York Times reporter] is right. It's a very legitimate looking website, but clearly, this is

also advancing an agenda."

　　　With breakneck speed, Checker A deftly traversed a digital morass, ignoring massive

amounts of material (she barely read the original article) to conclude that minimumwage.com

and EPI were not what they seemed. Though slightly less efficient, the other checkers

mirrored Checker A's lateral approach. The average time they took to leave the starting page

was just over half a minute ($M = 37$ s, $SD = 41$ s). None accepted EPI's description at face

value; instead, they read laterally, visiting an average of six pages before concluding that

minimumwage.com and EPI were cloaked sites that represented corporate interests.

Historians' Reading. Historians took longer, on average, to go from minimumwage.com to EPI than fact checkers took to conclude that *both* sites were the products of Berman and Company. Before prompting, only four of 10 historians connected minimumwage.com to the Employment Policies Institute. As in the previous task, Historians H and S were outliers. They left the landing page four times as fast as the others, averaging 26 seconds; their eight colleagues averaged 2 minutes, 5 seconds. Both were efficient lateral readers, wasting little time before opening additional tabs. Three of their colleagues, on the other hand, remained stuck on minimumwage.com for the entire task.

Even when some of the historians sought to read laterally—opening new tabs to research minimumwage.com or the Employment Policies Institute—they lacked essential searching skills. For example, a minute into the task, Historian K tried to learn more about minimumwage.com by opening a new tab to search for the name of the organization. But instead of putting the name of the organization in quotation marks and adding keywords like "funding" or "who is behind," she typed [minimum wage.com] into the search bar, separating "minimum" from "wage" and adding no additional terms. The outcome was an entire page of results issued by the very organization she was trying to investigate. Sensing a dead end, she added [conservative?] to the search bar, which produced yet another page of fruitless results (see Figure 6).

Figure 6. Historian K's search results for [minimum wage.com conservative?]
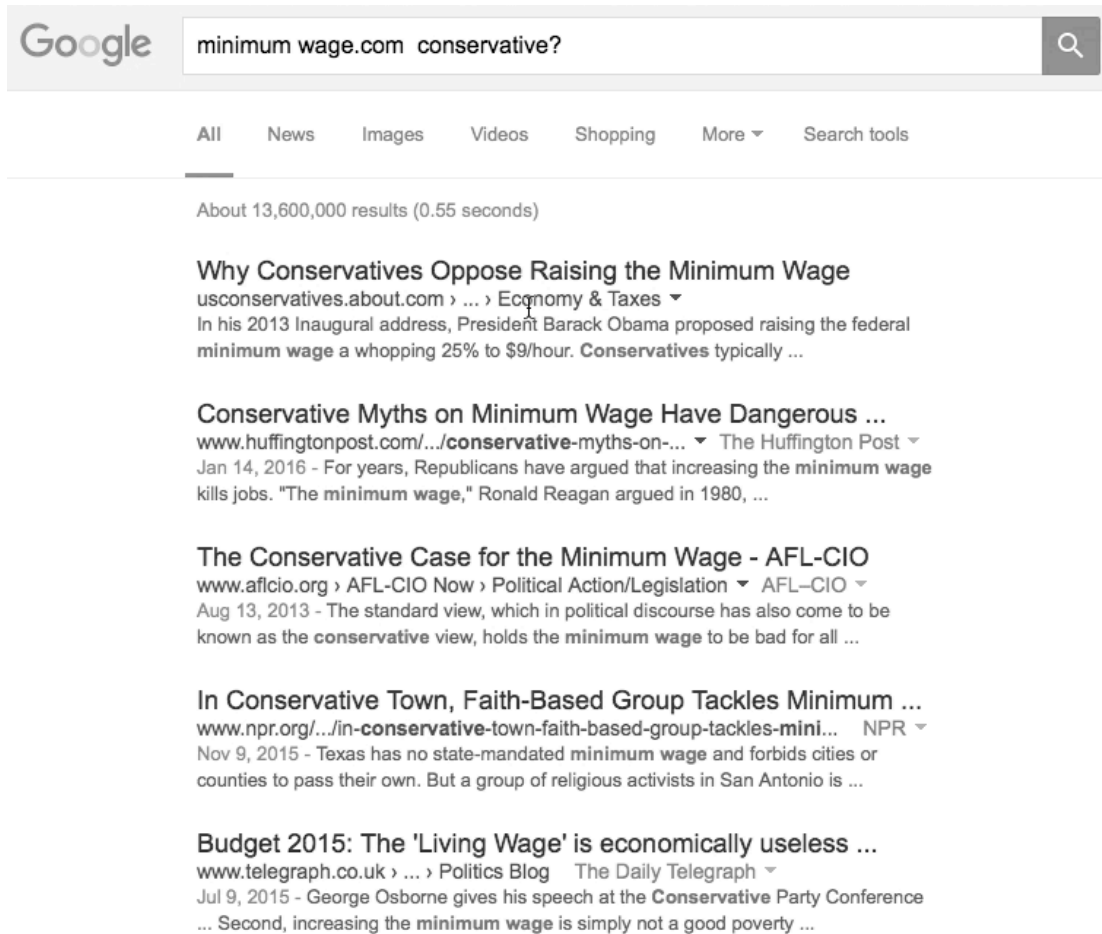
Stymied, the historian abandoned lateral reading and returned to the original

"Denmark's Dollar Forty-One Menu" page, no wiser than before. She clicked the page's

"Research" tab to engage in a more familiar task: "Let me see how I can interpret the

legitimacy of their research." Historian K was not alone: her colleagues fumbled such basic

moves as putting terms in quotation marks so that Google could search for contiguous terms.

Each of these historians was an astute reader, but reading skills alone weren't enough to pull

back the curtain from a cloaked website.

Students' Reading. Students struggled to get to the bottom of minimumwage.com.

They either spent too much time *reading vertically*, staying on the page and reading it as they

might a print document, or they engaged in *fluttering,* aimlessly moving across the screen,

"touching or not touching pieces of information … unconscious to its value and without a

plan" (Kirschner & Von Merriënboer, 2013, p. 171). When five minutes were up and before

being prompted, 80% of students had devoted *no time* to investigating who was behind

minimumwage.com.

Although some students left the landing page quickly, their exit was a far cry from the

strategy of taking bearings. Instead, they meandered to different parts of the site, making

decisions about where to click based on aspects that struck their fancy. A prospective

chemical engineering major quickly glanced at "Denmark's Dollar Forty-One Menu" before

scrolling to the bottom of the page and clicking on "In Your State," an interactive map where

users could click on different states and compare minimum wage rates and unemployment

statistics. He spent two minutes playing with it, longer than he spent reading the initial article.

Other students engaged in similar kinds of fluttering, clicking on features that piqued their

curiosity rather than those that would justifiably inform their judgment about the site's

trustworthiness (see Table 5).

Table 5

Students' Fluttering on Minimumwage.com

Links Clicked	Student's Comment while Clicking	Clicking Sequence
https://www.minimumwage.com/media/	"It's interesting how the Media page is kept very minimalistic, and then you click on other things [clicking on 'News Reports,' which leads to an EPI page] and it brings you to different pages [clicks back to 'Media' page]. But I think it's actually smart to keep that elsewhere just to organize it." (Student 19)	*Visited "Media" page after visiting the "Home," "Myths," "Research," and "In Your State" pages*
https://www.minimumwage.com/research/	"I don't really want to read their blog, and I'm not interested right now in what's my state's minimum wage and teen unemployment. . . . And videos and graphics are too time consuming." (Student 3)	*Explaining her reasoning for clicking on the "Research" page instead of the "Blog," "In Your State," or "Video and Graphics" pages*
https://www.minimumwage.com/news/	"I like the layout of the blog, I think it's also just very clear and everything's very cleanly laid out in a single column. Same with this ['Research'] page. . . . Oh, and then here's a description of the website. Um, this is a pretty cool page too." (Student 12)	*Clicked through several pages of the website, including "Home," "In Your State," "Blog," "Research," "About," and "Myths." On each page, she focused comments on appearance and organization*
https://www.minimumwage.com/media/	"Maybe this is an impartial website. Is there any such thing [clicks to 'Videos and Graphics' page] as an impartial website? I don't know. [reading advertisements posted on site] 'Unhappy New Year,' 'If 7 out of 10 doctors said you were sick, you would listen.'" (Student 1)	*Clicked to "Media" and "Videos and Graphics" pages after viewing the "Home" and "In Your State" pages*

Task 3: *Vergara v. California*

In May 2012, lawyers in California filed a lawsuit on behalf of nine public school students, including Beatriz Vergara. They argued that the system of teacher tenure in California violated the state constitution by denying equal protection to students with ineffective teachers. In June 2014, a California Superior Court ruled in favor of the students. The case cost more than a million dollars to prosecute, a sum that typically exceeds the spending money of nine adolescents. In fact, the legal team was hired and financed by David Welch, a Silicon Valley entrepreneur who founded the organization Students Matter.

The press, however, often omitted this detail. What made for good copy was a David-versus-Goliath tale of adolescents taking on a powerful teachers' union: nine students, mostly students of color, courageously confronting a rotten bureaucracy and demanding better teachers. A news item on the website of KABC, the Los Angeles ABC affiliate, reported that "The verdict is a win for nine students who sued the state saying that tenure policies have made it impossible for bad teachers to be fired" ("California Teacher Tenure," 2014). It made no mention of Students Matter, David Welch, or any of the big money that backed the suit.

Unlike the two previous tasks, this one began with a paper stimulus: the 379-word article from KABC. We gave participants time to read the article before telling them that the nine students had a million-dollar legal bill. We then asked them to spend five minutes searching for who paid the tab. Participants needed to, as it were, "follow the money" by locating information that named Students Matter, and ultimately David Welch, as the main backer of the lawsuit.

Vergara was a politically charged case with far-reaching implications. Students Matter

argued that the case was about getting rid of laws that were "handcuffing schools from doing what's best for kids when it comes to teachers" ("Vergara v. California," *n.d.*); the California Teachers Association painted it as a "lawsuit brought by wealthy corporate special interests looking to eradicate educators' professional and due process rights" ("Vergara v. State of California," *n.d.*). Given these conflicting claims and the number of bona fide news sources and partisan sites that wrote about the case, site selection and verification were essential. If participants could verify that Welch was the source of the plaintiffs' funding across bona fide sources, they could be more certain that they had successfully navigated politically muddy waters to arrive at the correct answer.

The 25 Stanford students were the fastest in identifying Welch as the source of funding (M = 1 minute, 42 seconds, SD = 86 s). Fact checkers and historians were slower. Historians took 2 minutes, 1 second (SD = 56 s), and checkers averaged 2 minutes, 8 seconds (SD = 93 s). Although they were the slowest to reach their conclusions, fact checkers were the most selective when it came to the sites they visited and took the most time to verify their answers.

We rated the quality of participants' conclusions using a 5-point scale. Participants were given a 0 if they never identified Welch; a 1 if they identified Welch but did so only through a questionable source; a 2 if they identified *and* verified Welch's role based on two or more questionable sources; a 3 if they identified Welch using a bona fide source; and a 4 if they identified and verified Welch's role through at least one bona fide source and one additional source. We defined bona fide sources as those that have systems in place to ensure the quality and accuracy of the information they provide (e.g., they have a retraction or correction policy, employ an ombudsman, separate their editorial and news divisions, and are

explicit about the methods with which they verify news) (Bounegru, Gray, Venturini, &

Mauri, 2017; Bulger & Davison, 2018).

Using our rubric, the fact checkers' conclusions merited a 3.6 ($SD = 0.70$), versus

historians' 2.4 ($SD = 1.3$) and students' 2.3 ($SD = 1.5$). Fifteen students scored a 0, 1, or 2,

while all but one of the fact checkers' responses scored a 3 or 4. A Kruskal-Wallis test showed

significance (H (2) corrected for ties = 27.5, $p < .001$); follow-up Mann-Whitney U tests

showed differences between fact checkers and students ($p = .016$).

The differences between the students' and the fact checkers' approaches can be seen

by comparing Checker D with Student 17, a mathematical and computational science major.

Both identified Welch in under a minute (34 seconds for the student, 50 seconds for the

checker). The student spent just a few seconds on the results yielded by searching for [vergara

v california]. He clicked on the first result (the Students Matter page), but quickly returned to

the search results, reminding himself, "I'm looking for the 'who paid.'" He selected

vergaratrial.com, a partisan site created by the California Federation of Teachers, where he

located Welch's name. He neither commented on the website's political stance nor whether he

found it trustworthy; he simply located Welch's name and accepted it as fact.

Checker D initially searched for [vergara v california] before quickly adjusting it to

[vergara v. california court records]. As she scrolled down the results, she said, "I'm coming

up with a lot of different information. I'd rather click on some press reports." She skipped the

first three results, all of which were affiliated with Students Matter, along with

vergaratrial.com and cacs.org (an organization she did not recognize), and instead opened

articles from three news organizations and Wikipedia. Exhibiting what we call *click restraint,*

she spent nearly 20 seconds scanning the search engine results page and reading the snippets before clicking on any link. Although she opened four additional webpages in new tabs (see Figure 7), her use of keyboard shortcuts meant that her eyes and focus never wavered from the results page. Checker D went first to Wikipedia, where she skipped over most of the entry by using the "Contents" menu to navigate to "Litigants." There, she read that "funding for the plaintiff school students was provided by David Welch, a Silicon Valley entrepreneur." She then clicked on the *Washington Post* article she had opened in a different tab. She used the command-F shortcut to search for Welch's name and confirmed his role in the case.

Checker D took 16 seconds longer than Student 17 to find Welch's name. However, she was more purposeful in the sites she opened, more discerning in the information she considered trustworthy, and more thorough in ascertaining that David Welch was indeed the money behind *Vergara v. California*.

Figure 7. Checker D's search results showing the sites she opened.

Historians. Historians were only slightly better than students in the quality of their conclusions ($M_{historians} = 2.4$ versus $M_{students} = 2.3$). Although several historians excelled, quickly locating Welch's name and verifying his role on trusted sites, two of them relied exclusively on partisan or questionable sources and made no attempt to verify their conclusions.

A third, Historian N, never made it to Welch. He searched for [Vergara v. California] and started with Wikipedia. Rather than using Wikipedia to quickly locate Welch's name, Historian N went directly to the references to find "a link to the case itself." For nearly three minutes, he examined the original court brief (number BC484642), scrolling up and down the PDF document, pausing at "Procedural History" and learning that the plaintiffs argued that the California Educational Code violated the equal protection clause of the state constitution. After searching in vain for the plaintiffs' backers, he abandoned Wikipedia and initiated a new search, adding "plaintiffs" and "attorneys" to his original query.

He clicked on the first result (studentsmatter.org, Welch's organization) and went to "Our Team," where he recognized the name of the lead attorney ("someone I know … the Solicitor General under Bush"). By the end of the task the only thing he could say was that the plaintiffs were represented by a "team with deep legal pockets." An accurate statement, but then again, this was the *starting point* for the task—participants were told at the task's start that legal fees in this case were "over a million dollars" and that their goal was to find out who paid the bill. By the task's end, this historian was no closer to answering the question than when he started. How come?

The simplest answer was that Historian N did what historians are trained to do: search

for primary sources. Had the task been to write a history of the *Vergara* case, initiating the research process with the court briefing might've made sense. However, when the goal was to quickly learn who backed the teenagers, a close reading of a labyrinthine legal document—which never mentioned Welch—took precious time and sapped limited energy.

Limitations

The purpose of this exploratory study was to better understand the nature of expertise in the evaluation of online information. We recognize, however, that any task that involves researchers peering over participants' shoulders creates an artificial environment that can distort what people ordinarily do. Despite repeated imperatives to "do what you normally do," it has to be odd to be shown sites not of one's choosing and given one-minute warnings to stop searching. Studies are needed that observe people evaluating websites in more natural settings. At the same time, we reasoned that tasks without time limits threaten ecological validity—just-in-time searches are generally matters of minutes or seconds, not hours (Liu, White, & Dumais, 2010; Nielsen, 2011). It's also possible that a different sample of sites might have yielded different results. We chose sites that covered a range of topics and perspectives and that varied in how forthcoming they were about their agendas. But even within the categories we selected, there are innumerable options, each with unknown content effects. More extensive research is needed to know if the strategies we identified are generalizable across topics, sites, and searches.

Additionally, it may have been the case that participants didn't put forth their best efforts, although we find that prospect unlikely. Our sample was comprised of people with high levels of self-regard and intellectual confidence. Looking foolish or appearing cavalier, especially when rendering judgments about issues of social and political moment, threatens that self-regard.

We are also aware that professional fact checkers were not the only possible group of experts we could have sampled. Others, such as Wikipedia editors who have earned the highest badges, specialists in cyber security, and professional librarians and information scientists, are also worthy of study. Teacher educators, especially those responsible for preparing new teachers to use information technologies, would be a fruitful sample, too. In their approach to websites, two of the ten historians resembled the fact checkers more than their fellow historians. Small sample sizes exaggerate differences (Jussim, 2012): we can't rule out the possibility that doubling or tripling sample size would have produced different results. Studies that require intensive protocol analysis always present a trade-off between sample size and available resources. That said, a sample of 45 nearly hour-long protocols is on the higher end for this genre of research.

Discussion

The participants in this study were all capable readers. Historians had esteemed publications to their credit and held coveted positions in a field where tenured faculty lines are increasingly rare. The fact checkers worked for prestigious publications and rubbed shoulders with famous authors who depended on them to get things right. Our college students gained admission to the most competitive university in the U.S. in 2015 (Stanford University, 2015). Yet, despite our participants' talents, there were unmistakable differences in how they navigated the web.

Only two of the ten historians adroitly evaluated digital information. Others were often indistinguishable from college students. Both groups fell victim to the same digital ruses. Considering our participants' experience and accomplishments, we are left to ask: What is it

about the Internet that bedevils intelligent people? What did fact checkers do that allowed them

to quickly and accurately discern the trustworthiness of information?

The answer, we suggest, lies with two concepts we introduced earlier: *taking bearings*

and *lateral reading*. In order to *take bearings,* searchers obey the following imperative: before

diving deeply into unfamiliar content, chart a plan for moving forward. Taking bearings is what

sailors, aviators, and hikers do to plot their course toward a desired destination. Landing in

unfamiliar territory, fact checkers set out for their destination—making a judgment of

credibility— only after gaining a sense of where they had landed. To take bearings, web

searchers obviously don't use a physical compass. But they need metaphorical compasses just as

much as hikers need real ones.

In an Internet teeming with cloaked sites and astroturfers (see Daniels, 2009;

SourceWatch, n.d.), taking bearings often assumes the form of *lateral reading*. When reading

laterally, one leaves a website and opens new tabs along the browser's horizontal axis, drawing

on the resources of the Internet to learn more about a site and its claims. When reading laterally,

fact checkers paid little attention to features of a website like its appearance or contents. Instead,

they quickly leapt off the landing page to open new tabs. Fact checkers, in short, learned most

about a site by leaving it.

Lateral reading differs from one of the main approaches to literacy advocated by the

Common Core State Standards. As defined by the Common Core's framers, close reading

encourages students to "read and reread deliberately" in order to "reflect on the meanings of

individual words and sentences; the order in which sentences unfold; and the development of

ideas over the course of the text, which ultimately leads students to arrive at an understanding of

the text as a whole" (PARCC Model Content Frameworks, 2011, p. 7). Close reading trains

students to parse grammatical structures, to ponder the metaphors and similes an author employs,

and to consider how minor shifts in word choice influence meaning. Close reading is essential to

any thoughtful curriculum (Shanahan, 2012; Wolf, 2007). However, the close reading of a digital

source when one doesn't yet know if the source can be trusted is neither efficient nor effective.

Just as close reading focuses students' attention on carefully analyzing text, so a popular

approach to teaching web evaluation advocates parsing the features and contents of an individual

webpage. Often presented as checklists, these guidelines focus attention on elements internal to a

website: Is its URL a .org or a .com? Is an author listed? Are there ads on the page? Are

hyperlinks functional? The questions that appear on these lists range from ten to as many as 30

(see Common Sense Media, 2012; Media Education Lab, *n.d.*, News Literacy Project, *n.d.*),

nearly all of which focus on easily manipulated features. Similarly, college library websites often

advise students to use "Five Criteria for Web Evaluation." These criteria ("Authority, Accuracy,

Objectivity, Currency, and Coverage,")—or variations on the theme (including the CRAAP test:

"Currency, Relevance, Authority, Accuracy, and Purpose")— focus, like checklists, on closely

reading and analyzing the contents of a single webpage. [insert Footnote 5]

Even if we set aside the concern that students (and the rest of us) lack the patience to

spend fifteen minutes answering lists of questions about a single site, a bigger problem looms:

identifying a .org URL, locating an author, and making sure a site is free of typos hardly confers

credibility. The Employment Policies Institute not only carried a .org domain but was labeled a

501(c)(3) "charitable organization." At a time when the Internet is characterized by polished web

design, search engine optimization, and organizations vying to appear trustworthy, such

guidelines create a false sense of security. Students and historians often stumbled because they closely read and followed the advice dispensed by checklists. Fact checkers succeeded because they didn't.

Instead of closely reading or ticking off elements on a list, checkers ignored massive amounts of irrelevant (or less crucial) text in order to make informed judgments about the trustworthiness of digital information. In short, fact checkers read less but learned more.

This approach contrasted with students' and historians' tendency to closely read and analyze webpages. There were, however, moments when fact checkers slowed down. College students were faster at finding the name of the financial backer in the *Vergara* case. But speed came at the expense of quality. Students arrived at David Welch's name by *promiscuous clicking*, often without regard to a source's reliability. Fact checkers took longer not because of faulty search strategies or unhelpful keywords, but because they slowed down and carefully reviewed search results before clicking on any one of them. They displayed *click restraint*: Before clicking on any result, they mined Google's snippets for the wealth of information they contain. They examined each URL, considered the source of the information, and scanned the brief but fecund sentence fragments before alighting on a link to click. They stood back from the results page and viewed it as a whole, gaining a sense of the "information neighborhood" (Klurfeld & Schneider, 2014) into which they had landed. A searcher's first click can mean destiny, either putting them on a path toward warranted conclusions or sending them into the wilderness of infinite regress. Click restraint tips the balance toward the former.

The strategies and heuristics that fact checkers deployed relied on three sources of background knowledge: knowledge of digital *sources*, knowledge of how the Internet and

searches are *structured*, and knowledge of *strategies* to make searching and navigating effective and efficient. Fact checkers recognized and distinguished among an array of online venues, including where sites spread out across the political spectrum (*Daily Kos* is liberal, *Daily Caller* conservative). They understood the characteristics that make a source reliable versus those that act as fallible proxies for reliability, such as how an unfamiliar organization describes itself on its "About" page. For example, the Employment Policies Institute describes itself as "a non-profit research organization dedicated to studying public policy issues." Checker A's reaction was curt: "This is profoundly *not* helpful." She knew that a nonprofit status does not stamp an organization as unquestioningly altruistic.

Yet knowledge of sources is necessary but not sufficient. Fact checkers also possessed knowledge of *online structures*, particularly how search results are organized and presented. They knew that the first result was not necessarily the most authoritative, and they spent time scrolling through results, often scanning the entire first page (and sometimes the second and third) before clicking on a link. They understood how search engine optimizers use sophisticated keywords and other techniques to game results, pushing some sites to the top and more authoritative sites to the bottom. Students and sometimes historians often clicked on the first few search results, rarely articulating a rationale for why they selected a particular link (a finding documented by others; e.g., Hargittai et al., 2010; Pan et al., 2007). Unlike fact checkers, they rarely took time to scan the entire search engine results page to gain an overall picture of the digital territory into which they had landed. They seldom clicked to the second or third page of search results, a finding common to over seventy percent of Internet searches (Schwartz, 2014).

Finally, lateral reading relies on canny strategies and heuristics for navigating the Internet. Some of these are easy to teach, like knowing that Google searches for contiguous words only when they are placed in quotation marks, or that right-clicking opens up new windows along the screen's horizontal axis (instead of piling window upon window). Other heuristics, like lateral reading and click restraint, are more involved and are undergirded by an understanding of the Internet and how it differs from print sources.

Teaching strategies like lateral reading and click restraint—as well as the knowledge that enables their effective use—will not solve all our information woes. However, these strategies may go part of the way in eliminating some of the most common errors in judging digital sources. Facing an onslaught of digital information, all of us need efficient strategies for separating truth from falsehood, good arguments from bad. As an example, consider the daunting challenge faced by California voters trying to sift through seventeen separate initiatives on the 2016 ballot: plans to increase the tobacco tax, ban plastic bags, limit the sale of ammunition, legalize recreational marijuana, require porn stars to wear condoms while filming, approve a bond to build new schools, repeal the death penalty or make it easier to mete out, and so on. If the average citizen spent ten minutes researching each initiative, we would consider this an act of responsible citizenship. The educational challenge we face is this: What can we teach to ensure that those ten minutes *count*?

Addressing this challenge in an age where we encounter the world through a screen can begin with a course on media literacy. However, it cannot stop there. The digital revolution demands a fundamental reconsideration of how we teach all of the core school subjects. What should history teaching look like when students can go online and find "evidence" for the canard

that "thousands" of black men put on grey uniforms to take up arms for the Confederacy? Or science teaching when anti-vaxxer sites maintain a "proven" link between autism and measles shots, despite a retraction by the journal publishing the claim and the fact that "no respectable body of opinion" supports the linkage (*Walker- Smith v. General Medical Council*, 2012)? Or language arts class when *ad hominem* arguments and "alternative facts" overwhelm civil discourse?

Technology can do many things, but it can't teach discernment. In Thomas Jefferson's day, an earlier technological revolution, the advent of moveable type, drastically lowered the cost of print. Jefferson watched with dismay as untrustworthy pamphlets and broadsides of dubious quality littered the streets. Jefferson understood that a dark side accompanies the expansion of expression. We would do well to take his solution to heart, as well as to realize it won't come cheaply: "If we think [the people] not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them, but to inform their discretion by education."

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Footnotes

Footnote 1: We sampled historians and fact checkers on the basis of professional affiliation and full-time employment as historians at four-year colleges and universities. We did not ask these participants for information about their race or ethnicity, languages spoken, or country of origin.

Footnote 2: In addition to the tasks presented here, the full protocol included 1) brief evaluations of four static sites, 2) an open web search on a historical question with contemporary ramifications, and 3) locating the registrant of a website. The findings from those tasks are broadly consistent with what we present here. A description of the full protocol is available from the authors.

Footnote 3: The statement from Collins, which was posted on the National Institutes of Health website, is also available via the Web Archive: http://web.archive.org/web/20110727115017/http://www.nih.gov/about/director/04152010_statement_ACP.htm.

Footnote 4: The stance is prominent in other parts of the website, such as a "Position Statement" entitled "On the Promotion of Homosexuality in the Schools," which states that "the homosexual lifestyle carries grave health risks"; that "validating a student's same-sex attraction during the adolescent years is premature and may be harmful;" and "sexual reorientation therapy can be effective." Retrieved from https://www.acpeds.org/wordpress/wp-content/uploads/On-the-Promotion-of-...pdf.

Footnote 5: The University of Alaska/Fairbanks guide is located at https://library.uaf.edu/ls101-evaluation, while Illinois State University's is https://guides.library.illinoisstate.edu/evaluating/craap.