Commentary

Studying mis- and disinformation in Asian diasporic communities: The need for critical transnational research beyond Anglocentrism

Drawing on preliminary research about the spread of mis- and disinformation across Asian diasporic communities, we advocate for qualitative research methodologies that can better examine historical, transnational, multilingual, and intergenerational information networks. Using examples of case studies from Vietnam, Taiwan, China, and India, we discuss research themes and challenges including legacies of multiple imperialisms, nationalisms, and geopolitical tensions as root causes of mis- and disinformation; difficulties in data collection due to private and closed information networks, language translation and interpretation; and transnational dimensions of information infrastructures and media platforms. This commentary introduces key concepts driven by methodological approaches to better study diasporic information networks beyond the dominance of Anglocentrism in existing mis- and disinformation studies.

Authors: Sarah Nguyễn (1,2), Rachel Kuo (3,4), Madhavi Reddi (4,5), Lan Li (3,4), Rachel E. Moran (1,2)
Affiliations: (1) Information School, University of Washington-Seattle, USA, (2) Center for an Informed Public, University of Washington-Seattle, USA, (3) School of Information and Library Science, University of North Carolina-Chapel Hill, USA, (4) Center for Information, Technology, and Public Life, University of North Carolina-Chapel Hill, USA, (5) Hussman School of Journalism and Media, University of North Carolina-Chapel Hill, USA
Received: November 4th, 2021. Accepted: February 8th, 2022. Published: March 24th, 2022.

Introduction: Mis- and disinformation as global

In June 2021, a subscriber of Vietnamese conservative influencer Sonia Ohlala² sent the following message via encrypted messaging app Telegram: “Black Lives Matter is a movement set up by all the communists to loot, oppress people, and cheat money from donors.”³ The message’s focus on “communists” makes salient how the historical context of socialism and communism within Vietnamese diasporic groups has been weaponized to stoke negative sentiment around Black Lives Matter—leveraging historical

---

¹ A publication of the Shorenstein Center on Media, Politics and Public Policy at Harvard University, John F. Kennedy School of Government.
² Known for her YouTube channel, Ohlala has more than 157,000 subscribers to one of her channels, and her videos often receive up to 350,000 views.
³ Translated from the original post in Vietnamese to English by the authors. See Sonia Ohalala, June 6, 2021, Telegram, https://t.me/soniaohlala/681
frameworks to increase the saliency of particularized misinformation. Moreover, the sharing of the message on the encrypted messaging app Telegram warrants further attention, given that the platform has increasingly been used to host communities and conversations that have been subjected to moderation and flagging on mainstream communications platforms (Murphy, 2021).

Mis- and disinformation traverses platforms, borders, and languages, and acquires cultural saliency as content moves through localized information infrastructures. Understanding the spread and impact of problematic information necessitates contextual grounding within the socio-historical and political contexts of different communities. Mis- and disinformation exploits nationalism, identity-based appeals, historical and contemporary traumas, and root structures of power (Reddi et al., 2021; Kuo & Marwick, 2021). Meanwhile, the bulk of empirical research and theorization around the spread, impact, and strategies to counter mis- and disinformation focuses predominantly on English (or native-language) mis- and disinformation (e.g., Pennycook & Rand, 2019; Pérez-Rosas et al., 2017). The Ohlala anecdote mentioned above illustrates why we must expand the focus of mis- and disinformation research beyond Anglocentrism (knowledge production centered on and dominated by English language and Anglo-American contexts) and pushes us to consider the transnational dimensions of mis- and disinformation.

This commentary highlights our nascent research on mis- and disinformation within Asian diasporic communities and understanding transnational information infrastructures and politics. Information and communications technologies (ICTs) retain transnational complexities that are shaped by differences in use and outcomes across geographic and cultural contexts, in addition to the tensions that arise from distinctly national (often Western) companies operating global ICTs. Attending to the complexities of problematic content thus requires a transnational approach that attends to information transmission across national boundaries, including multinational perspectives.

We use mis- and disinformation in this article to refer to false and/or misleading information; rather than focusing on individual malintent, our approach emphasizes information in relation to systems of power. We synthesize themes from our preliminary research on the impact and spread of mis- and disinformation across four diasporic and multilingual contexts—Vietnam, Taiwan, China, and India—and demonstrate the various sources, forms, and consequences that information circulates across multiple languages, generations, platforms, cultures, and nations that are not currently attended to in dominant literature. Emergent trends in mis- and disinformation research also take on a utilitarian framework of harm, concentrating resources and attention on crisis events that impact “global populations,” without attending to the differential harms experienced by historically marginalized populations. Presumptions of universal generalizability thus silos and deprivileges research on diasporic communities by marking them as “other”—ungeneralizable, specific, and unique case studies (see also de Albuquerque et al., 2020; Chakravartty, 2020; Ng et al., 2020). Given these contexts, we argue that it is critical to study the transnational flow of problematic information across platforms.

We seek to foreground qualitative methods when researching diasporic populations to address historical and cultural contexts and community-specific needs within information behaviors (Komlodi & Carlin, 2004), which are often lost when solely relying on quantitative and network analysis methods. Additionally, research on mis- and disinformation and digital platforms in the U.S. tends to focus on Twitter and Facebook, rather than attending to other social media platforms used by diasporic communities (Arqub et al., 2020). Methodologically, qualitative methods, including interviews or ethnographic approaches, are necessary to account for socio-cultural contexts behind platform use and trust.

Our observations emerge from early research and initial project development for two different studies. One qualitative study led by Sarah Nguyễn and Rachel Moran (University of Washington-Seattle, Center for an Informed Public) investigates salient misinformation narratives within Vietnamese diasporic communities through data collection of public posts from Facebook, videos on YouTube, and through focus group discussions with community members. Another qualitative study led by Rachel Kuo with
Madhavi Reddi and Lan Li (University of North Carolina-Chapel Hill, Center for Technology, Information and Public Life) uses semi-structured interviews and community oral histories to comparatively and relationally examine the history and politics behind mis- and disinformation. Together, these projects offer in-depth qualitative and community-centered approaches to studying information spread in non-English speaking, diasporic, and immigrant communities.

Current themes and challenges in understanding mis- and disinformation in diasporic communities

In initial interviews and informal conversations with different organizers and community groups, four themes emerged as hurdles to overcome in order to conduct critical, transnational, and community-oriented research on the spread and impact of misinformation on diasporic communities:

1. **Legacies of imperialism and militarism and ongoing geopolitical tensions across diasporas:** Mis- and disinformation spreads across cultural, socio-linguistic, and geographic contexts and impacts communities differently according to pre-existing power structures and unequal distributions of informational resources (Thakur & Hankerson, 2021). In order to adequately examine the ways in which mis- and disinformation circulates in Asian diasporic communities, a grounding in the histories of these communities is needed to contextualize the multiple layers of power interests. This may include legacies of British imperialism such as in India, Spanish and U.S. imperialism such as in the Philippines, or even intra-Asian imperialist pursuits such as Japan’s rule of Korea. In other words, race “in the national”, or race as understood within national boundaries such as the U.S., is also situated within conditions of empire and transnational contexts (Reddy, 2011, p. 19). The predominance of English-language research is also underpinned by academia’s colonial legacy and Anglophone Western foundations in knowledge production (Chakravartty et. al, 2018; Mejia et al., 2018; Geeraert, 2018)—dominant in empirical research. The resulting theoretical frameworks privilege whiteness and fail to address the geopolitical contexts of mis- and disinformation in immigrant and diasporic communities, as well as the ways legacies of imperialism structure media systems (Aouragh & Chakravartty, 2016).

2. **Transnational news networks and information infrastructures:** Transnational ties refer to the affective, communicative, and economic relationships that migrant families build between the societies of origin and destination. They are complex multidirectional, multilayered, and multilingual networks with intergenerational connections established through continual global migration (Wakabayashi & O’Hagan, 2021). Within the context of mis- and disinformation, it becomes important to look further than a primary relational stream (i.e., U.S. plus the rest of the world) via the dominant language (e.g., English), which fails to account for the dynamism of language and culture, geographically and temporally.

   Many first-generation immigrants with limited English proficiency turn to ethnic media, including print, broadcast, and social media, as primary sources of information (Fang, 2021; Nguyen & Solomon, 2021). For example, in the context of Indian immigrants, Somani (2013) finds that first-generation Indians in the diaspora often prefer Indian television channels over local channels. Not only does it keep them abreast with happenings in India from an Indian perspective, but it also “reinforc[es] their group identification” (Somani, 2013, p. 61). This trend is reproduced online: YouTube in the Vietnamese diaspora is an information-rich space for community, news, entertainment, and business, as well as a site of ideological polarization (Dien, 2017; Anh, 2018; H. Nguyen, 2021; P. Nguyen, 2021). Information propagates through various channels across multiple disparate nations and languages with individuals disseminating ideas rapidly through social circles and across platforms (Zeng et al., 2016)—making “local” problems “global” ones.
3. Lack of data access: Private forms of communication, such as mobile messaging apps, facilitate the spread of mis- and disinformation and necessitate culturally informed and relational modes of study, beyond simple challenges of data access (Malhotra, 2020). According to a 2020 voter survey, nearly one in six Asian Americans use messaging applications such as WeChat, WhatsApp, and KaKao to discuss politics (APIA Vote, AAPI Data, and Asian Americans Advancing Justice, 2020). Access to data on these applications is difficult to obtain without direct consent from users and raises additional questions over data ethics and surveillance (Barbosa & Milan, 2019). This means less empirical study and public evidence about how and what types of mis- and disinformation spread within Asian diasporic communities due to information sharing within closed, private networks.

Often, this evidence comes from first-hand observations that occur through informal discussions, such as screenshots sent to family and friends. Additionally, information networks are geographically siloed, making it difficult for U.S. scholars doing transnational research to access data eclipsed by the dominance of U.S. media. This does not mean that currently available observations are not significant, nor does this mean a lack of robust knowledge-sharing activity. Several community organizations, such as Viet Fact Check⁴ and Equality Labs,⁵ have been undertaking their own forms of research within their own diasporic communities, including developing customized media monitoring techniques, creating community surveys, and making in-language toolkits and platforms for community-specific interventions. However, this research can pose issues for scholarly replicability and also pose high individualized and collective risks given ongoing nationalisms and authoritarianism within countries of origin.

4. Issues of language interpretation and translation: Translation in mis- and disinformation research is complicated, given the limitations of automated transcription and machine-based translation to offer contextual interpretation, as well as at times limited monetary resources for human translation and transcription. We understand translation and language as political, considering what is or is not translated, how it is translated, how interpretations are altered between languages, and how the impact of translation on information spreads. Importantly, translating services such as Google Translate favor Eurocentric interpretations of texts that do not adequately address the contexts from which they come (Nasser, 2017). For example, community activists working on 2020 Get Out the Vote (GOTV) campaigns within Hmong communities⁶ in California highlighted frustrations around mistranslations on voter registration websites. While government landing pages offered options to translate the page into Hmong, the translations offered up contained significant mistranslations, embedding a sense of exclusion for Hmong voters (Ryan-Mosley, 2021). Researchers need to look beyond verbatim translations to the historical and socio-cultural factors that shape the way information is crafted and distributed.

Below, we detail empirical examples from four cases—Vietnamese, Taiwanese, Chinese, and Indian diasporic communities—to demonstrate the intersecting ways the above observations emerge in different contexts. These examples are by no means exhaustive summaries of each community but intended to highlight the necessity for research methods that address the complex nuances between and across Asian and Asian American diasporas.

Case 1: Socio-cultural histories structure information disorder among Vietnamese immigrants

The Vietnamese American diaspora consists of crosscutting generations of refugees and immigrants

⁴ Viet Fact Check is a volunteer-run initiative that provides fact checking and online media analysis in Vietnamese and English.
⁵ Equality Labs is a Dalit-led feminist organization that builds community power through organizing, research, art, and digital training.
⁶ Hmong are indigenous peoples mainly from Southwest China, Vietnam, Laos, Thailand, and Myanmar, and their diasporic communities are primarily due to refugee and immigration from the American War and a long history of colonization.
before, during, and after the American War\(^7\) and holds histories of imperialisms from China, France, Japan, and the U.S. Historically, propaganda has shaped the mid-twentieth century narrative of US-Vietnamese relations (Bailey & Zuckerman, 2021), resulting in many Vietnamese American refugees aligning with white saviorist narratives of having been “rescued” from a war-torn communist state, with others reckoning with the violence of war as motivated by imperialism and militarism (Nguyen, 2012). Historical conflict is reflected in contemporary political and information behaviors, such as social media discussions capturing the divisive views of Reunification Day. For example, an Instagram post by the Cầu Kiều Collective celebrating the liberation of Saigon (Cầu Kiều Collective, 2021) sparked controversy and discussion on Reddit, wherein users clashed over the significance of reunification and accusations that the posters were aligned with political ideologies of oppressive communist states (thuy, 2021).

Our focus group research into misinformation within Vietnamese American diasporic communities seeks to better understand historical connections to individual and group level complexities in diasporic communication patterns and practices, including deeply rooted distrust in authoritative or mainstream informational sources. Within Vietnamese diasporic communities, histories of violent state encounters with socialism and communism make salient anti-China sentiment and fears of communism, exploited by conservative political interests and misinformation narratives, such as viral posts shared in familial messaging groups about Biden and Harris being “communists” (Tran, 2020). This holds further impact as it restricts the effectiveness of in-language fact-checks. Focus group participants commented that family members dismissed fact-check sources as “socialist” and therefore untrustworthy. Alignment with right-wing rhetoric about communism follows historical contexts in which older generations recall lived experiences of trauma, where they perceive communist politics as the root cause that split apart their families and motherland. Younger generations, particularly those who lean more progressively, hold different definitions of and relationships to communism, as contemporary political discourse speculates the aftermath of universal/social benefits of post-colonial and post-capital systems. The impact of long-standing socio-cultural and historical tensions highlights how research and interventions to minimize the spread and impact of mis- and disinformation cannot treat Asian diasporic communities as monolithic.

**Case 2: Polarizing politics within Taiwanese community networks**

Political discourse and news circulation across Taiwanese diasporic communities offer examples of geopolitical tensions across transnational news infrastructures. China-Taiwan political relations, Taiwanese independence, and sovereignty from China or “One China” unity dominate political discourse, including how people participate in U.S. electoral politics or favor particular political candidates based on their stances vis-à-vis China and Taiwan. Some Taiwanese government actors who are pro-independence may have also been pro-Trump during the 2020 elections, given perceptions surrounding Trump’s stance on China and Taiwan’s relationship to the U.S (White House, 2020). These political factions also impact how people participate and communicate within their community and family information networks. In an interview, one person shared how they didn’t discuss politics in LINE group chats, a Japanese messaging app popular amongst Taiwanese diasporic communities: “I don’t pass on news ... all your stereotypes will be seen. If your LINE is political, in the end, you’ll fight. Everyone leaves.”

Where people may be politically positioned also depends on histories of migration to both Taiwan and the U.S. For example, Rachel’s family migrated to Taiwan prior to World War II and the Chinese Kuomintang occupation of Taiwan, with grandparents experiencing Japanese occupation of Taiwan; her

---

\(^7\) The naming of the 1955-1975 war that took place in Vietnam has its own controversy as it depends on whose point of view we are referring to. Americans called it the Vietnam War or the Anticommunist War while the Vietnamese refer to it as the American War or the Second Indochina War. The North Vietnamese and the Viet Cong refer to it as an anti-imperialist war. Each of these communities come from their own experiences and understanding of reasoning for the War’s incentives which impact how they classify the war in name.
parents migrated in the 1980s through a family visa sponsorship and grew up in Taiwan under a period of martial law. Their particular background and experience both shape their politics as supporting pro-Taiwanese independence from China and their media consumption practices, where they remain wary about news information tied to overtly nationalistic interests. In an initial family oral history, one family member expressed how political positioning as well as countries of origin impact where and how their friends and social networks receive news: “People pay more attention to their home country’s politics [...] their understanding of adopted country’s news comes from the home country, so their understanding of U.S. politics [is] from China, Hong Kong, or Taiwan. Depending on where you stand, you can get the news you want.” The family member also expressed concerns about nationalism in community newspapers and how that may impact news coverage of COVID-19 spread and health information in Taiwan and China respectively. This example illustrates the importance of attending to geopolitical histories undergirding information spread as well as transnational networks of information.

Case 3: Reaching information spaces across the generations in the Chinese diasporic community

Within the Chinese diasporic community, particularly for first-generation Chinese immigrants who rely on Chinese-language media, news comes from platforms of multinational origins. Unlike second-generation Chinese Americans, who may be more fully situated in mainstream U.S. media, the elder generation Chinese immigrants and Chinese Americans rest in a closed or semi-closed information space that spans both the US and China, making this hard-to-reach group highly vulnerable to mis- and disinformation attacks (Zhang, 2018). With a proliferation of native language news sources to choose from and fewer avenues to confirm or deny their veracity, information shared across messaging groups within and outside of the U.S. often heightens confusion and sows distrust.

Due to the often private nature of messaging groups, using an oral history interview method offers a rare glimpse into this understudied corner of the information ecosystem. Information spaces are often opaque for the younger generation to understand when informally observing family members and loved ones. Second-generation Chinese Americans interviewing their elders provide a unique opportunity to foster intergenerational understanding of each other’s information practices. Through the intimacy of close relations, we are able to gain insights into the context of information consumption and spread within terms and boundaries that the first-generation interviewees feel comfortable with, while further uncovering the histories and politics of migration that the younger generation may desire to learn more deeply about. Oral history interviews can be a gateway towards learning more about the information diet of their loved ones, and to open a door for these crucial, albeit at times challenging, conversations to continue (Boyd & Ramirez, 2012; Medoff, 1991). The intergenerational exchanges between first and second-generation Chinese Americans undergird the importance and value of an oral history-based research methodology in reaching Chinese American and other immigrant Asian American communities.

Case 4: Challenges and risks of studying disinformation in the Indian media landscape

Hindu-Muslim tensions and caste hierarchies have played a big role in India’s history and continue to shape the country’s socio-political landscape, both in India and abroad. Muslims, India’s largest minority population, are one of the main subjects of disinformation campaigns by nationalists who support Modi’s ruling Bharatiya Janata Party (BJP) and the Hindutva cause. Many Indian diasporic communities use WhatsApp to connect with family and friends, as well as for participation in political discourse. Many users of WhatsApp are part of political group chats, and the app has been used as a tool of Hindu Nationalist
and Islamophobic propaganda in India (Basu, 2019). A recent study by MIT and the Indian Institute of Technology that examined millions of messages in over 5,000 Indian Whatsapp groups found anti-Muslim messages are shared faster, wider, and remain active for longer than other fear speech messaging (Banerjee, 2021). These messages are not only circulated within the subcontinent, they are shared amongst Indians globally. During the COVID-19 pandemic alone, numerous claims circulated across Whatsapp and other social media platforms linking Muslims to the spread of the virus. In their report on Islamophobic social media content, Awan and Khan-Williams (2021) found that the content shared accused Muslims of not adhering to social distancing rules, blamed open Mosques for the spread of COVID-19, and much more.

In 2021, the South Asia Scholar Activist Collective was formed to “highlight a common threat that is being waged against academic freedom and against freedom of speech and thought in the U.S.: Hindutva ideology, otherwise known as Hindu nationalism” (Chakravarti et al., 2021). Hindutva, distinct from the Hindu faith, refers to a political ideology that associates Indian nationhood with Hindu sociocultural identity. This has been the guiding ideological framework of Modi’s ruling Bharatiya Janata Party (BJP), resulting in widespread discrimination of Muslims, as well as religious and caste non-dominant groups, through disinformation in India and its diaspora—what Reddi et. al (2021) broadly term as “identity propaganda.” South Asian community organizers and scholars conducting research and other efforts to challenge Hindu nationalism have faced targeted harassment, doxxing, and online abuse (Soundararajan et al., 2019; Chakravarti et al., 2021). This ultimately speaks to the risks incurred when doing disinformation research and the lack of data access that shapes these projects.

Conclusion: Expanding critical and transnational approaches

This research is challenging but necessary. In addressing these theoretical and methodological challenges, we offer several recommendations. First, we advocate for more resources being dedicated towards mixed-methods and interdisciplinary research, led by and in collaboration with Asian diasporic communities. As a multitude of institutions and foundations seek to fund research and initiatives to build healthier democratic ecosystems, attention should be paid to immigrant and non-English language communities in the U.S., as well as transnational diasporic communities. While operating locally in tech hub cities across the U.S., multinational corporations like Facebook and Twitter operate at a global scale, impacting different sites outside of the U.S. This also means attending to other transnational platforms including WhatsApp and WeChat as political platforms. We also advocate for more institutional and public funding to be allocated towards resourcing community-based work, including partnerships between researchers and organizations and for translation and interpretation services. Many organizations are already doing this research within their own diasporic communities, and there can be more resources dedicated towards community-based knowledge production and building connections across communities.

Second, we argue for an expansion of how we consider the “harms” of mis- and disinformation, including the different scales and gradations of harm; the specificities of who bears the brunt of harm; and understanding harm beyond what is “measurable” and technically solvable. For example, definitions and conversations of the harms of mis- and disinformation tend to be shaped around an individual-collective dichotomy (either “I” as an individual have been deceived and fooled or “we” as a society have been damaged). However, there are other vital social structures that are damaged, including familial relationships. Additionally, there are power relationships at work beyond whiteness at the center—legacies of war and empire between non-Western nations; inter- and intra-community conflicts, tensions,

---

8 According to a Lokniti-CSDS Mood of the Nation (MOTN) survey, “every sixth user is a member of a political WhatsApp group. This makes WhatsApp the most important tool of propaganda used by political parties in India” (Basu, 2019).
and hierarchies; and language and cultural schisms to name a few. While forces of white supremacy, imperialism, and militarism continue to drive ongoing global disparities, we also see the need to understand the intricacies of power formations in locally sited ways, in order to more specifically name and address harms (Jack & Avle, 2021; Ong, 2021).

Third, we see a need for rethinking theorizations within communication and information studies to account for Western dominance and Anglocentrism, in order to understand how mis- and disinformation spreads and how it impacts different communities. This fundamentally requires an understanding of different historical and geopolitical contexts that are at the root of mis- and disinformation. Additionally, rather than silo this research as particular and specific, this scholarship can be better valued as contributing broadly to how we understand questions of trust, mediation, platform infrastructure, political mobilization, and more. In other words, scholarship about and by non-English speaking, non-Western, and non-white should not be treated as anomalous, while scholarship specific to white and/or Western audiences and communities continues to count as “universal.”

Our nascent research into mis- and disinformation within immigrant and marginalized populations highlights the richness of knowledge captured when whiteness is decentered from mis- and disinformation studies. As an emerging field, mis- and disinformation studies must be challenged to build out theory on more than U.S.-EU-centric empiricism, lest it repeat the mistakes of other academic disciplines. As researchers grapple with totality and the complexities of mis- and disinformation, we highlight the necessity of including non-Anglophone, non-white contexts, and advocate for a breadth of embedded, qualitative methods to enable this.

**Bibliography**


Murphy, H. (2021, September 17). Telegram emerges as new dark web for cyber criminals. *Financial Times.* [https://www.ft.com/content/cc3e3854-5f76-4422-a970-9010c3bc732b](https://www.ft.com/content/cc3e3854-5f76-4422-a970-9010c3bc732b)


Soundararajan, T., Kumar, A., Nair, P., & Greely, J. (2019). *Facebook India: Towards the tipping point of violence: caste and religious hate speech.* Equality Labs. [https://static1.squarespace.com/static/58347d04bebaafbb1e66df84c/t/5d0074f67458550001c56af1/1560311033798/Facebook_India_Report_Equality_Labs.pdf](https://static1.squarespace.com/static/58347d04bebaafbb1e66df84c/t/5d0074f67458550001c56af1/1560311033798/Facebook_India_Report_Equality_Labs.pdf)

thuy [dummie619]. (2021, April 30). *Happy Reunification Day from my friends in the Cậu Kiểu Collective! Follow them on social media to learn about Vietnamese culture, history, & politics from a leftist, international perspective.* [Online forum post]. Reddit. https://www.reddit.com/r/VietNam/comments/n23nt2/happy_reunification_day_from_my_friends_in_the/


Authorship
All authors contributed equally to this work. The commentary was collectively authored by members of the Transnational Misinformation Working Group—Sarah Nguyễn, Rachel Kuo, Madhavi Reddi, Lan Li, and Rachel Moran—and is a collaboration between researchers at the Center for an Informed Public (University of Washington-Seattle) and the Center for Information, Technology, and Public Life (University of North Carolina-Chapel Hill).

Funding
Research on misinformation in diasporic Vietnamese communities was funded by George Washington University’s Institute for Data, Democracy, & Politics and University of Washington Center for an Informed Public. Research on the history and politics behind Asian and Asian American mis- and disinformation at the Center for Information, Technology and Public Life at the University of North Carolina-Chapel Hill is supported by Siegel Family Endowment. The authors also received financial support from the John S. and James L. Knight Foundation and Microsoft.

Competing interests
The authors do not have any competing interests to declare.

Copyright
This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided that the original author and source are properly credited.