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Media Health Literacy: A Scoping Review and Agenda for Future Research

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As more people turn to mediated sources of health information, the public's widespread susceptibility to mis/disinformation has highlighted the role that media health literacy (MHL) plays in increasingly complex media and health care landscapes. To understand how adults navigate their cross-section, this article offers the first published scoping review of MHL. The results show that MHL was developed for adolescents and remains largely within youth demographics. No adult MHL study has been conducted anywhere in the world with a representative sample or with an instrument that employs direct measurement. The findings indicate that little is known about how MHL manifests in adults, with half of all studies lacking theoretical frameworks. This article discusses the societal implications of the current MHL landscape and offers a new construct—Adult Media Health Literacy—that is grounded in the first ecological model of media literacy as a social determinant of health. Future research directions are discussed.

Keywords: adult media health literacy, scoping review, media literacy, health literacy, health mis/disinformation, social determinants of health

For centuries, the persistent threat of health mis/disinformation[2] has plagued every public health advancement from the discovery of immunizations and the introduction of water fluoridation to the advent of birth control. In modern times, the diffusion and consequences of medical misinformation have reached unprecedented levels of harm, with hundreds of thousands of preventable deaths associated with COVID-19 mis/disinformation alone (Bursztyn, Rao, Roth, & Yanagizawa-Drott, 2020; Caceres et al., 2022; Gisondi et al., 2022). At the same time, the American public has increasingly relied on mediated technology as its primary source of health information.

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[2] Misinformation is defined as information that is false or misleading according to the best available evidence at the time. Disinformation is the intentional production and dissemination of false information (Office of the Surgeon General, 2025).

In the 2022 National Health Interview Survey, 58.5% of U.S. adults said they have turned to the Internet to look for health or medical information in the past 12 months (Wang & Cohen, 2023). National polling has also shown that 24% of U.S. adults use social media at least weekly to find health information or advice (Kaiser Family Foundation [KFF], 2023). The same poll found that roughly 50–75% of adults are unable to discern between false and true health claims, such as "The COVID-19 vaccines have caused thousands of sudden deaths in otherwise healthy people" (KFF, 2023, p. 12). Thirty-four percent believe this statement is definitely or probably true. Susceptibility to false health beliefs is not circumscribed to highly politicized health topics, however. In 2024, two national surveys on sun safety revealed that a growing number of young adults are forgoing sunscreen based on the belief that daily sunscreen use is more harmful to the skin than direct sun exposure—despite years of scientific evidence to the contrary (American Academy of Dermatology, 2024).

Susceptibility to health misinformation has been explained, in part, by two forms of literacy: media literacy[3] (ML) and health literacy (HL)—two constructs that have consistently been shown to be independently related to health-related beliefs and behaviors (Bergsma & Carney, 2008; Vahedi, Sibalis, & Sutherland, 2018). Health literacy primarily operates at the level of functional literacy and seeks to prevent adverse health outcomes related to an inability to access, sufficiently comprehend, or act upon vital health information and resources (Baker, 2006). Most HL research is limited to the elderly, individuals with chronic health conditions, and those with limited English proficiency. Conversely, ML research skews toward children and adolescents and, in practice, aims to engender critical inquiry, empowerment, self-reflexivity, and lifelong learning.

Media and health literacy each offer important avenues for understanding different abilities, beliefs, and outcomes; however, neither literacy alone accounts for the synergistic set of knowledge, skills, and practices that manifest at their intersection—that is, MHL. Like ML, the construct of MHL has largely been developed in adolescent contexts, where it has been shown to be effective in reducing risky health behaviors, such as smoking. This leads us to ask what evidence exists that a similar relationship unfolds among working-age adults, a multigenerational demographic of health decision-makers who have been understudied to date as it pertains to MHL, health mis/disinformation, and health behaviors/outcomes in adulthood.

Aims and Purpose

Toward this end, a scoping review was selected to systematically map the volume, nature, and characteristics of adult MHL research. A search of the Cochrane Library and Campbell Collaboration databases indicates that no scoping or systematic reviews have been conducted on the topic to date. The review criteria and analysis were guided by the following research questions:

RQ1: What is known about the conceptualization and measurement of MHL (without restrictions on age and population)?

[3] The term "media literacy" is used as an umbrella construct and includes related terms, such as MHL, information literacy, digital literacy, and critical ML, among others (Media Literacy Now [MLN], 2024).

RQ1a: What theoretical frameworks guide its construction and measurement?

RQ2: What is known about the conceptualization and measurement of adult MHL (without restrictions on population nationality)?

RQ2a: What is known as it applies to adults in the United States?

Scoping questions regarding measurement instruments were included for two reasons. First, as a cross-disciplinary construct, MHL sits at the intersection of communication and media studies, and public health. The latter arena—typically the primary domain of HL interventions—often uses quantifiable variables to examine relationships between latent constructs and health outcomes, thus requiring evidence-based measurement instruments (RQ2). The second reason relates to the role of quantified data in policy settings, which is an important consideration for understanding the downstream components of MHL. In these contexts, the perception of "objective" numerical data becomes an increasingly important tool for transcending partisan anecdotes and advancing public policy.

Regarding RQ2a, the decision to further examine these questions in the context of the United States reflects unique structural features that contribute to health infodemics in America, including the increasing privatization of health care and an almost entirely privatized media market (expanded upon in the Discussion section).

Structure

The next section begins with a "rapid review" of ML and HL. A rapid review is a truncated systematic review process that serves to contextualize the scoping review that follows on MHL. Based on the results, the article then presents a new construct—Adult Media Health Literacy (AMHL)—and a set of 17 associated competencies and practices that can be operationalized in future research. Lastly, to better understand ML's relationship with human health, a theoretical model is introduced, positioning ML as a social determinant of health.

Rapid Review

Constructs

Media Literacy

The most commonly used definition of ML is the ability to "access, analyze, evaluate, create, and act using all forms of communication" (MLN, 2024, p. 1). In fact, the universal promotion of ML across the lifespan has been recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as essential to "ensuring healthy lives and well-being" (Grizzle et al., 2021, p. 3). Despite this, population-specific data on the media capabilities and practices of adults in the United States are scant (Bergsma & Carney, 2008). This reflects the fact that ML research and education in the United States predominantly target adolescents, college-age adults, or adults aged 65 and older. Broadly speaking, ML

research and practice among younger demographics tend to focus on the components of *analyze*, *evaluate*, and increasingly, *create*, whereas in elderly populations, the focus shifts to *access*—i.e., access to basic technological resources, the development of functional computer skills, or education around digital predators/scams (Hargittai, Piper, & Morris, 2018).

A common throughline, however, is the recognition that critical reasoning plays a significant role in ML across the lifespan. Research has consistently shown that ML is positively associated with higher-order thinking and discernment, with lower levels of ML associated with increased susceptibility to digital mis/disinformation (Huguet, Kavanagh, Baker, & Blumenthal, 2019; Nan, Wang, & Thier, 2022; Pennycook, Bago, & McPhetres, 2023).

Health Literacy

Personal HL is defined as "the degree to which individuals have the ability to find, understand and use information and services to inform health-related decisions and actions for themselves and others" (Centers for Disease Control and Prevention [CDC], 2023, p. 1, para 2). Mainstream conceptualizations of HL converge on four longstanding dimensions: *access*, *comprehension*, *empowerment*, and *information use* (Liu et al., 2020; Nutbeam, McGill, & Premkumar, 2017). The most recent population estimates of personal HL among U.S. adults are from 2003 and show that nearly 88% of adults lack proficient HL skills, meaning they have difficulty navigating health care systems, interpreting prescription labels, and understanding the purpose of preventive, diagnostic, and therapeutic care (Kutner, Greenberg, Jin, & Paulsen, 2003; Lopez, Kim, & Sacks, 2022).

As a result, a body of public health research shows a significant relationship between low HL and adverse health outcomes/behaviors, including mortality and lower compliance rates with preventive cancer screenings and immunizations (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011; Bigsby & Hovick, 2018; Shahid et al., 2022). Accordingly, most HL research in the United States is clustered around the elderly, adults with chronic health conditions, and those with limited English proficiency, and HL competencies generally coalesce around basic proficiencies in comprehension and numeracy.

Measuring ML and HL

In addition, a rapid review of 44 peer-reviewed ML and HL instruments revealed important measurement shortcomings. As listed in Appendix A,[4] 13 of the 44 instruments reviewed were related to ML and revealed two important gaps and considerations. First, there exists a sampling bias. As expected, most ML scales have been validated among children and adolescents, followed by seniors. Second, most ML instruments rely on closed-ended self-efficacy questions.

This is partly due to the burden of analyzing open-ended data, the challenges of scale, and the design costs of task- and performance-based measures. Although data captured from self-report Likert scales are cheaper and faster to produce and analyze, their quality is inferior to direct measurements. Even

[4] Appendix A: https://osf.io/zdgc2?view_only=d490191eb62447979e74472f17e21546

when solicited anonymously, self-assessments are vulnerable to bias effects, social desirability errors, and a lack of awareness of one's deficits (Gross & Latham, 2011; Mahmood, 2016). These limitations are well-documented in both media and health literacy settings (Canady & Larzo, 2022; Scheiber, Karmasin, & Diehl, 2023). Multiple digital literacy reviews have concluded that performance tests are better predictors of people's actual digital literacy than users' self-perceived abilities alone (Hargittai, 2005; Hargittai & Hsieh, 2011). This becomes especially relevant when assessing complex or sensitive matters such as susceptibility to health misinformation.

Next, a review of existing HL instruments began with a search of the Health Literacy Tool Shed, an online database of the National Institutes of Health's Library of Medicine (National Institutes of Health, 2024). The inventory, which indexes a total of 280 peer-reviewed HL instruments, returned 93 HL scales validated in English with sample populations between the ages of 18 and 64. Of these, 62 were disease- or issue-specific (e.g., nutrition literacy). This left 31 general HL scales listed in Appendix B.[5] As expected, they exhibited a sampling bias skewed toward the elderly, chronically ill, and patients with limited English proficiency. The majority of the 31 scales are performance-based but very narrowly construed, rapid (lasting 2–3 minutes), and primarily designed to screen for functional literacy. They are most often conducted in clinical settings, with only five offered as computer-based assessments.

Scoping Review: Media Health Literacy

Methods

Building on the rapid review, a comprehensive scoping review was undertaken to identify the extant literature on AMHL. In line with the Joanna Briggs Institute framework, an *a priori* protocol was drafted using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (Appendix C[6]; Arksey & O'Malley, 2005).

Eligibility Criteria

Articles included in the review had to be written in English and published in a peer-reviewed journal. In line with the aims of RQ1 and the constructs that emerged in the rapid review, the search criteria limited the scope to articles that reference "media health literacy" or an alternative syntax, "health media literacy." No publication date range was set in an effort to determine the genesis of the construct of interest before assessing its application in adult contexts. For the same reason, the criteria did not narrow the sample by age or country of origin.

Information Sources, Search Strategy

Six electronic databases were searched: APA PsycNet, Web of Science, Applied Social Sciences Index & Abstracts, Communication Source, Scopus, and ProQuest. The term "media health literacy" or

[5] Appendix B: https://osf.io/wt6qe?view_only=d490191eb62447979e74472f17e21546
[6] Appendix C: https://osf.io/x3gh4?view_only=d490191eb62447979e74472f17e21546

"health media literacy" was required in the title or abstract. The eligibility criteria did not preclude search returns that included wraparound syntax such as "critical," "social," or "new" MHL, all of which were included. As shown in Figure 1, the databases returned 49 results; further screening yielded a final sample of 20.

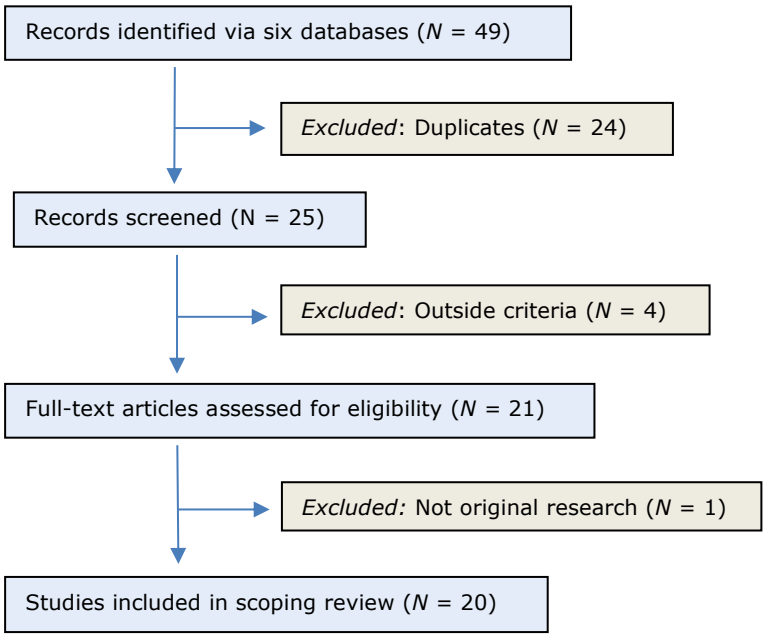

Figure 1. Flow diagram, selection of sources of evidence.

The chosen methodological protocol reflects the standards set by Arksey and O'Malley's (2005) framework for scoping reviews and the Joanna Briggs Institute System for the Unified Management, Assessment, and Review of Information. Neither specifies a minimum number of studies for scoping reviews and states that the volume will vary significantly based on the topic.

With this in mind, the decision was made in the *a priori* protocol to widen the inclusion criteria. That is, even though the primary research interest is AMHL in the United States, the search criteria and final sample and analysis included all ages, studies from any country (in English), and studies with allied constructs (MHL, HML, CMHL, SMHL, and COVID-NMHL). There was also no limitation on publication date to ensure the capture of all existing peer-reviewed articles.

Results

The primary variables extracted from each of the 20 articles are charted and are available in Appendix D.[7] Broadly categorized, the articles include intervention pilots (*n* = 6), health-behavior studies (*n* = 5), scale development/validation (*n* = 4), conceptual syntheses (*n* = 3), and systematic reviews (*n* = 2). Publications span multiple disciplines, with the majority in communication and media (*n* = 9), followed by public health (n 7), education (*n* = 2), psychology (*n* = 1), and pediatrics (*n* = 1). Demographically, 10 of the articles focus on adolescent populations, seven on adults, and three are unspecified, as shown in Figure 2. Among the 20 studies, most were conducted in Canada (*n* = 4) and Iran (*n* = 4), followed by the United States (*n* = 2), Israel (*n* = 1), China (*n* = 2), Egypt (*n* = 1), Taiwan (*n* = 1), and Thailand (*n* = 1). The remaining four were unspecified. Eleven of the 20 studies were qualitative studies, and four were mixed methods. Of the five quantitative studies, one had a quasi-experimental study design, and the remaining were cross-sectional surveys.

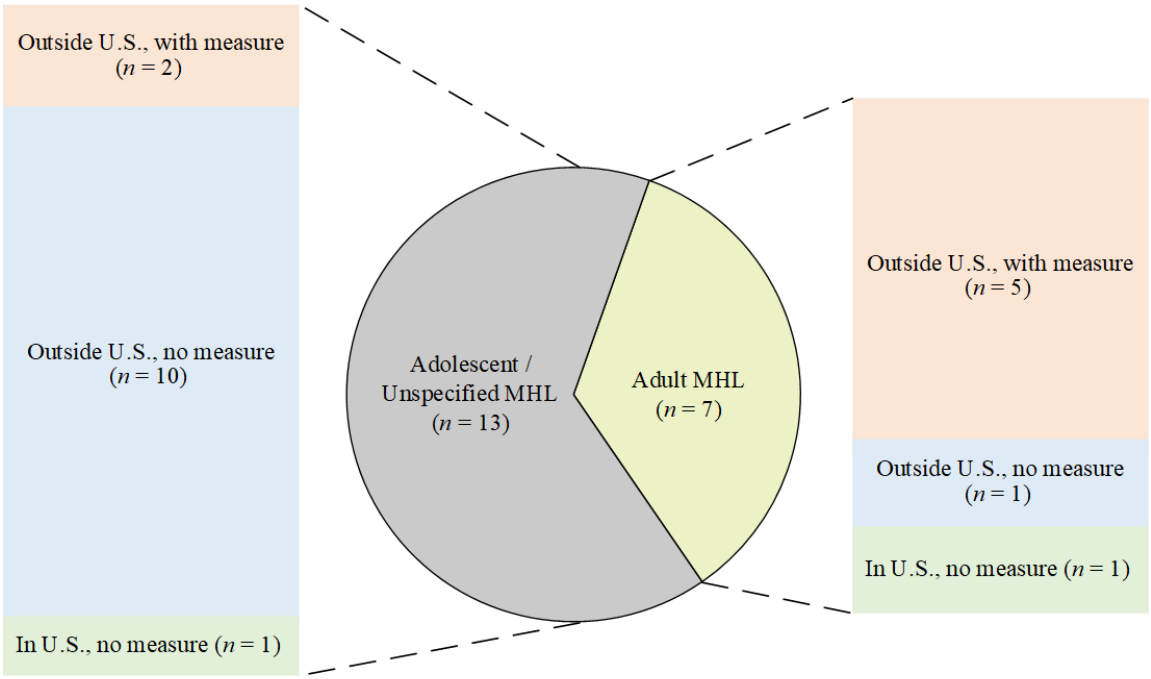

Figure 2. Global distribution of MHL studies by age, measurement.

Collectively, five constructs are mentioned: "media health literacy" (*n* = 11), "critical media health literacy" (CMHL; *n* = 6), "social media health literacy" (SMHL; *n* = 1), "health media literacy" (HML; *n* = 1), and "COVID-19 new media health literacy" (COVID-19 NMHL; *n* = 1). The definitions for each, when

[7] Appendix D: https://osf.io/a5c87?view_only=d490191eb62447979e74472f17e21546

provided, are listed in Appendix E.[8] Publication dates range from 2011 to 2024, with the first mention of MHL appearing in a 2011 peer-reviewed research article titled "Media Health Literacy: Development and Measurement of the Concept Among Adolescents." The authors—public health scholars Diane Levin-Zamir and Rosa Gofin, and media researcher Dafna Lemish—conducted a study with adolescents in Israel to develop the concept of MHL and produce an associated measurement scale. Their founding definition of adolescent MHL includes four core abilities: (1) *identify* health-related content (explicit and/or implicit) in various types of media; (2) *critically analyze* the content; (3) *recognize its influence* on health behavior; and (4) *express intention* to respond through action measured through personal health behavior or advocacy (Levin-Zamir, Lemish, & Gofin, 2011).

Using a performance-based measurement of MHL, they found that a higher MHL score was shown to increase empowerment and decrease an adolescent's odds of practicing unhealthy behaviors, such as smoking and underage alcohol consumption. The next year, public health and literacy scholars in Canada expanded on their work, publishing a conceptual synthesis that introduced the construct "critical media health literacy," a reorientation of adolescent MHL that places greater emphasis on the attributes of empowerment and civic engagement (Higgins & Bergoray, 2012).

The research that has emerged since has lacked comparable conceptual scaffolding. Over a third of the 20 articles did not define their constructs of interest, and half did not use an explicit theory or model to derive their definitions or research questions. Of those that did, five drew from socio-ecological models and frameworks, and the rest from mood management theory (n = 1), inoculation theory with transportation theory (n = 1), the message interpretation process model (n = 1), and social cognitive theory/the theory of planned behavior (n = 2). However, even among these, most mentioned theoretical frameworks are in passing, without a comprehensive explanation of how they inform the construct, its operationalization, or its measurement.

Overall, less than half of all studies included measures of MHL. Among the 13 adolescent/unspecified studies, three used measurement instruments, with one conducted in the United States, as shown in Figure 2. Among the seven adult studies, five included measurements, though all relied on indirect self-assessments, as listed in Appendix D. One study was conducted in the United States with a population comprising Latinx adults living with HIV (i.e., not a representative sample of U.S. adults).

Given this review's population of interest, the following section will focus on the seven studies that comprise samples of adults aged 18 and older. Of those seven, one is conducted in Egypt, one in Canada, one in the United States, one in Taiwan, one in China, and two in Iran. Across all seven studies, a cumulative sample of 1,645 reflects the limited number of adults aged 18+ included in MHL studies worldwide. Methodologically, two employ qualitative methods; four are quantitative studies; and one is mixed methods. The latter five include measurements of MHL (Appendix F[9]). One uses an adapted version of the eHealth literacy scale to measure SMHL (Anter, 2022); one uses the "COVID-19-related New Media Health Literacy Scale" (Hung, Yang, & Luo, 2021); and three use the Adult MeHLit Questionnaire (Nazarnia, Zarei, &

[8] Appendix E: https://osf.io/6khb3?view_only=d490191eb62447979e74472f17e21546
[9] Appendix F: https://osf.io/r39ku?view_only=d490191eb62447979e74472f17e21546

Rozbahani, 2022), one of which is administered in Chinese (Li, Zhang, Liang, & Yu, 2023). All five measures exclusively use self-reported assessments. Unlike the others, the MeHLit scale was validated among adults, but it was developed using frameworks exclusively designed for adolescents.

To summarize, half of the studies did not base their work on any theoretical foundation, and about one-third of all studies failed to provide basic definitions or competencies. The findings indicate that no AMHL study has been conducted anywhere in the world with a representative sample or with an instrument that employs direct measurement. Notably, what is known about MHL is almost exclusively derived from adolescent populations outside the United States. While there exists no codified definition or measurement of "adult media health literacy," the constructs of MHL and CMHL have been applied in highly limited adult contexts. What research exists offers promising signals that a similar interactive process unfolds across the lifespan. A theoretical model for how and why this manifests is posited in a later section.

A New Construct: Adult Media Health Literacy

Based on the findings of the scoping review, a conceptual expansion of MHL is required to capture a demographic underrepresented to date—that is, adults and, more specifically, working-age adults. The category of "working-age adults" commonly refers to those aged 18 to 64 (Organization for Economic Co-operation and Development [OECD], n.d.). The minimum age reflects legal "adult" status in most countries, while the upper bound is the average retirement age. In the United States, however, most young adults do not begin working full-time until the age of 22. A more relevant and useful age range for "working-age adults" in the context of AMHL is adults in their "prime working years": ages 25 to 54 (OECD, n.d.). This reflects the core features of target MHL demographics: adults in their pivotal preventive health care years and those with children and/or elderly dependents.

Next, to operationalize the mechanics of AMHL, we look primarily to communication and media studies, a reflection of the research trajectory in this arena (as shown in the Results) and of AMHL's positionality as a sub-literacy of ML. Two main schools of thought have contributed to the theoretical underpinnings of ML research and practice: cultural studies and critical theory. Cultural studies scholars view ML as a social and cultural practice and, as such, offer a social theory of literacy (STL) (Buckingham, 2003). The STL de-emphasizes ML as a purely linear, textual exercise and foregrounds the networked and socially constructed nature of engaging with and processing media in all forms. Accordingly, the STL contends that people's meaning-making process is mediated by their social, economic, cultural, and historical environments. In less abstract terms, the STL would focus less on "competencies" per se and more on practices—such as dialogical reflection, participatory learning, media production, and engaged citizenship—as key markers of ML and media education (Bergsma, 2004).

However, many STL practices are codependent on prominent variables in cognitive models of ML advanced by critical theorists (Potter, 2004). These include, among others, knowledge of media industries and media effects, as well as cognitive skills such as critical reasoning and abstraction. Formulations of ML from a critical standpoint lend themselves to more quantifiable forms of measurement and evaluation. Additionally, health literacy promotion has historically drawn from a didactic criticalist paradigm (Nutbeam, 2008).

While tension remains between the two schools of thought (Hobbs, 2011), significant ideological overlap exists. In the context of MHL, Higgins and Begoray's construction of CMHL is an instructive example of blending the two. At its core, CMHL comprises "a skill set" that includes "discriminating and interpretive abilities," "empowerment," and "engaged citizenship" (Higgins & Begoray, 2012, pp. 139–140). This article extends their hybrid approach to adults, providing a calibrated construct that reflects core adult media and health literacies that have emerged through the rapid and scoping reviews.

While there is conceptual overlap between the attributes inherent to adolescents and adults, several considerations make AMHL a unique construct. To begin, AMHL involves socio-ecological factors, skills, and practices that fluctuate throughout the decades-long course of adulthood. As discussed later in the context of a socio-ecological model, these factors can include—among others—geography, workforce participation, insurance status, cultural norms, and age. Notably, age is a significant predictor of HL given that adults, compared to adolescents, tend to experience more extensive interactions with health care systems as they age, thereby developing incrementally higher levels of HL, particularly as it relates to the dimension of *access* (Appendix G[10]).

In addition, the chronologically dynamic nature of human health means that the issues deemed most pressing vary throughout the life course. In adolescence, MHL studies largely focus on issues pertaining to negative body image perceptions, unprotected sex, smoking, and underage drinking. These differ significantly from the health considerations that arise later in life, such as forgoing the COVID-19 vaccine or avoiding recommended breast cancer screenings due to myths about radiation exposure.

Furthermore, unlike adolescents, working-age adults often serve as the primary health decision-makers for their children and elderly dependents. Common examples include parents forbidding teenagers from using birth control based on myths such as risks of long-term infertility; not vaccinating young children against infectious diseases due to false claims that they lead to autism and severe side effects; or navigating unproven claims of "miracle cures" with elder dependents. For adults with dependents, the affordances and implications of MHL are multifaceted and consequential.

Defining and Operationalizing AMHL

Informed by the extant literature on adult ML, adult HL, and adolescent MHL, a new construct, definition, and associated set of competencies are proposed.

> **Definition**: *Adult Media Health Literacy* is a cumulative competency that involves five core abilities: the ability to (1) ***access*** health-related information from various sources; (2) ***identify*** key elements of message construction; (3) ***critically evaluate*** message credibility, quality and relevance; (4) ***produce*** messages using a variety of media tools; and (5) ***engage*** with a global media culture.

[10] Appendix G: https://osf.io/kxw48?view_only=d490191eb62447979e74472f17e21546

As shown in Appendix G, each of these dimensions is buoyed by a set of evidence-based competencies and practices. Conceptually, adults fall on a spectrum of AMHL that fluctuates throughout their lives. As a whole, AMHL is not a dichotomous skill or ability. While its component competencies generally build on each other, they are not necessarily progressive in nature, meaning individuals may have some capacity to identify key media-construction concepts but may not be able to produce content using contemporary media tools, for example.

Beginning with the domain of *access*, one example is the ability to access electronic health records (Appendix G, 1d), a key technical and informational gateway in contemporary HL development. Another component (Appendix G, 1c) establishes a baseline ability to understand the meaning of common yet important health- *and* media-related words, symbols, and processes. These could include terms such as "telehealth" and "user-generated content" or symbols such as a verified checkmark on an X account. The dimensions of *produce* and *engage* (Appendix G, 4, and 5) extend AMHL beyond technical and cognitive abilities and into a social context, where using media to participate in a knowledge pool and form a sense of community empowers people, builds collective intelligence, and serves as an integral part of engendering social cohesion and civic engagement (Jenkins, Purushotma, Weigel, Clinton, & Robison, 2009).

The dimensions of *identification* and *critical evaluation* reflect attributes generally associated with critical theory. One ability particularly relevant to health contexts is understanding the implications of different content formats (e.g., an editorial vs. academic research article) and types of evidence (e.g., anecdotal vs. empirical data; Appendix G, 3d). Other *identification* items provide straightforward knowledge measures that reflect the critical role that emerging technology plays in informational ecosystems (Appendix G, 2c). The operationalization of *critical evaluation* reflects the underlying structural features of the U.S. media and health care systems, which require a greater level of individual discernment and critical evaluation. Among others, relevant competencies include recognizing the interests of content producers (e.g., commercial vs. noncommercial) and how they might shape the message (Appendix G, 3b), as well as using various critical-reasoning strategies—such as identifying bias and recognizing conflicts of interest—to judge content credibility and quality (Appendix G, 3c). There are also sociocultural components of *critical evaluation* that resist the emphasis on an externally dictated world schema and instead focus on a reciprocal agency in which an individual's sociocultural position contributes to their unique meaning-making process (Appendix G, 3h). This is particularly relevant in the context of health literacies, which activate deeply personal and bodily decisions. These are just a few examples of the operationalization of AMHL as a theoretically grounded interdisciplinary construct. The full set of competencies and practices is intended to serve as a springboard for future research, practice, and policy at the intersection of media and public health.

A Theoretical Model: Media Literacy as a Social Determinant of Health

While social and critical theories of literacy inform the mechanics and attributes underpinning AMHL, there remains a need for a broader conceptual understanding of how and why ML and nested subconstructs, such as AMHL and CMHL, relate to health behaviors/outcomes. This article seeks to bridge this gap by including ML as one of 20 social determinants of health within the socio-ecological model of health (SEM)—

one of the most prominent public health models in the study of human health. The SEM contends that a range of socioeconomic factors contribute to health conditions at the individual level. These factors are often collectively referred to as social determinants of health (SDH), defined by the World Health Organization (WHO, 2019) as the *nonmedical factors* that shape human health, such as the "conditions in which people are born, grow, work, live, and age, and the wider set of forces [. . .] shaping the conditions of daily life," including social norms, policies, and economic systems (p. 1).

As shown in Figure 3, the 19 SDH are organized under five interconnected categories: economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context (U.S. Department of Health and Human Services [HHS], n.d.). Each category comprises specific inputs, with ML now added as the fifth SDH under the category of social and community context, in line with the STL.

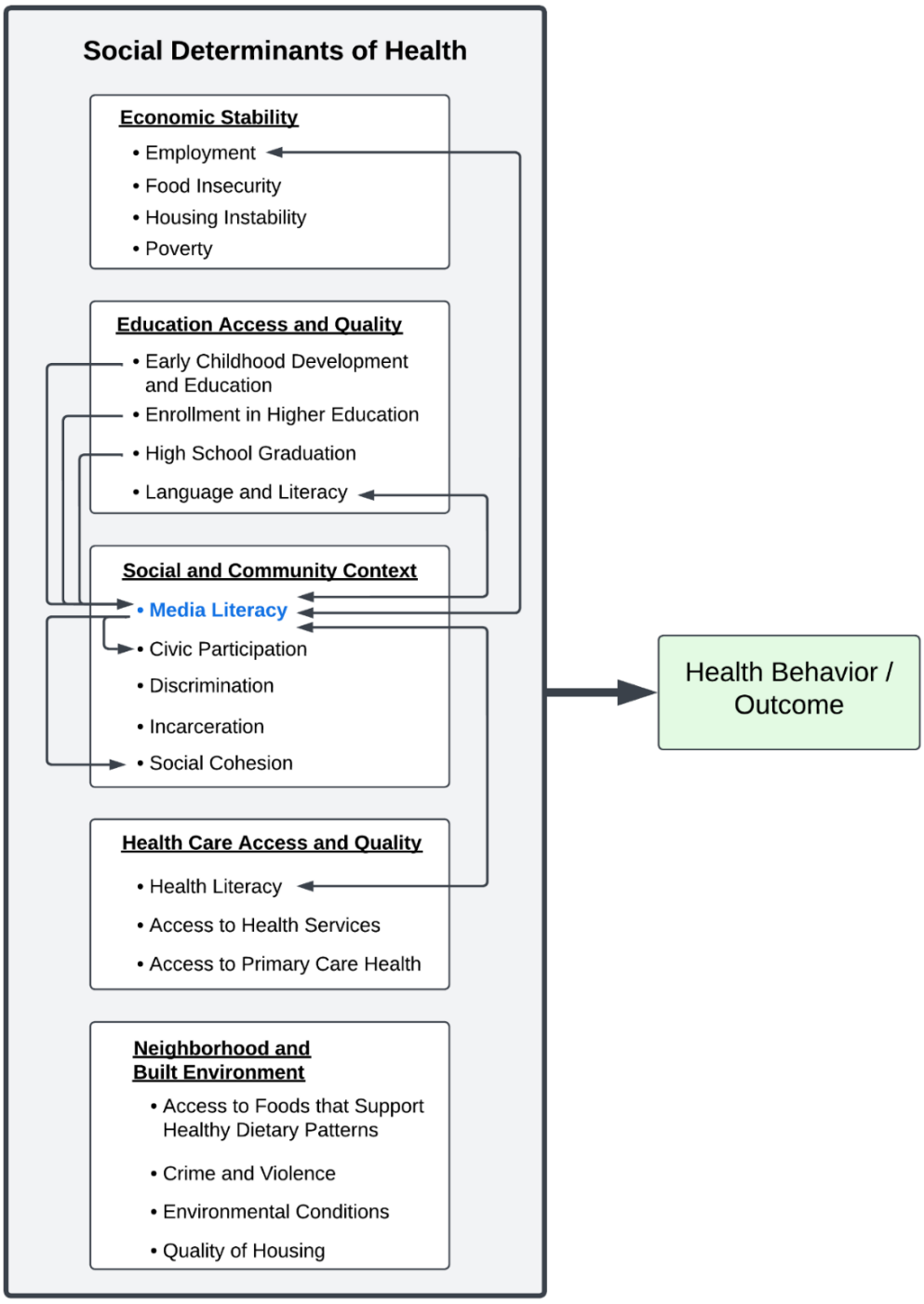

Figure 3. Media literacy as a social determinant of health.[11]

SDH variables interact in a complex web, where each pre-existing SDH variable has a direct relationship with specific health behaviors/outcomes and mediating/moderating relationships with other SDH variables (HSS, 2022). This means that a change in one aspect can significantly impact other areas, creating a cascading effect. For example, it is known that the SDH of *access to primary care health* is directly related to the health behavior of vaccination; however, other SDH such as *employment* and *discrimination*—and ML—can and do moderate the relationship. As indicated in Figure 3 and explicated below, it is well-established that ML shares uni- and bi-directional relationships with eight SDH variables[12]: *early childhood development and education*; *enrollment in higher education*; *high school graduation*; *health literacy*; *language and literacy*; *employment*; *social cohesion*; and *civic participation*.

A uni-directional relationship (shown by a one-way arrow) indicates that a change in one variable has been shown to lead to a significant change in another. For example, a one-way relationship between *early childhood development and education* and *ML* indicates that a child with greater access to early education will be more likely to have a higher level of ML later in life and, in turn, a greater likelihood of healthy behaviors and outcomes (Herdzina & Lauricella, 2020). That likelihood is then moderated by other SDH variables such as *poverty*. The same logic applies to the SDH categories of *enrollment in higher education* (Potter & McDougall, 2017) and *high school graduation* (Leu et al., 2013).

Bi-directional relationships are indicated with two-way arrows,[13] meaning the variables influence each other in a dynamic, reciprocal manner—or that a change in either can affect the other. For example, SDH *health literacy* and *language and literacy* share two-way relationships with *ML*, where a higher level of one yields reciprocal booster effects (Afshar et al., 2020; Bergsma, 2004; Coughlin, Vernon, Hatzigeorgiou, & George, 2020; Hobbs & Frost, 2003; Jenkins et al., 2009). Another example is the relationship between AMHL and *employment*, in which a person's ability to produce content using a variety of media and digital tools (Appendix G, 4) improves the odds of stable employment in modern society (Bejaković & Mrnjavac, 2020; Mamedova & Pawlowski, 2018). Inversely, a lack of participation in the labor market can reduce the odds of acquiring or maintaining the skills needed to secure an economically stable job. Particularly among older adults, media scholars have shown the benefits of online work and learning and their gateway effects on economic stability and social well-being (Hargittai et al., 2018).

Lastly, the relationship between ML and SDH *social cohesion* and *civic engagement* is well-documented. Media literacy's role in promoting empowerment, social capital (Jakubowicz, 2007), and civic engagement (Livingstone, Couvering, & Thumim, 2005; Martens & Hobbs, 2015) through practices such as *production* and *engagement* (Appendix G, 4 and 5) are key attributes of an informed and healthy citizenry. Viewed collectively, the model offers a high-level visualization of the role ML plays in the health and well-

[11] Researchers and practitioners are encouraged to substitute the umbrella construct with more narrow sub-literacies depending on their population and subject of interest. For example, if examining the relationship between technology literacies, social inclusion, and mental health among the elderly, a sub-ML such as information and communication technology literacy might be more appropriate.

[12] The scoping and rapid reviews reveal similar relationships with AMHL and CMHL.

[13] Displaying all known relationships between each SDH exceeds the scope of this figure.

being of individuals in contemporary society and provides a unified picture of the socio-economic variables that have been shown to mediate and moderate the relationship between ML and human health.

Discussion

A comprehensive scoping review set out to identify the bounds and depth of research on MHL, specifically focusing on adult populations. The results show that the construct of MHL has taken a foothold in ML and education efforts among adolescents but has yet to establish a significant pool of knowledge as it pertains to adults—with virtually no research conducted within the United States (RQ1, RQ 2). Despite a body of evidence documenting an inverse relationship between adult ML and susceptibility to mis/disinformation, and a parallel body of evidence linking adult HL to adverse health outcomes, very little is known about the intersection of the two among adults and its association with health beliefs, behaviors, and outcomes. This extends beyond practical applications, with limited theoretical grounding regarding the meaning and composition of AMHL (RQ1–1a). Research in this arena also tends to forgo formal measurements, and in cases where measurement is available, there is an overreliance on self-report measures (RQ2).

Regarding the absence of ML, HL, and MHL research among working-age adults (RQ1), two explanations are offered: the first relates to sampling challenges, and the second to systemic barriers that de-incentivize social literacy research. First, as previously discussed, ML efforts hyperfocus on adolescents and college-age adults; hence, recruitment largely relies on schools (typically high schools and universities), which offer a low-cost and accessible participant pool. Given their positionalities, teachers are naturally more invested in the topic, and students are more likely to participate as they are not required to miss work or secure childcare. On the other end of the spectrum, the sampling of older populations for HL research relies largely on existing health care channels[14] and/or senior living and community centers. These are also relatively accessible and low-cost points of entry.

Accessing a representative sample of working-age U.S. adults, however, is not as straightforward. The demographic is highly heterogenous (which requires larger sample sizes) and lacks centralized points of access. Recruitment is more challenging, and sampling is costly. Even professional research recruitment services, such as Prolific, do not offer nationally representative survey samples within the exclusive age range of 25 to 54, as they rely on existing census data, which are provided to them in pre-determined age blocs.

In addition to the challenges of cost and scale, more macro considerations are relevant for understanding the persistent gap in ML, HL, and AMHL research and policy. At a structural level, the commercially driven ethos of education, health care, and media in the United States de-prioritizes the types of investments—financially, politically, and culturally—inherent to the development of MHL across the lifespan, including the promotion of social literacies and an ecologically oriented approach to human health.

[14] The majority of HL assessments are conducted in clinical settings.

Decades of decreased funding in the social and public health sciences have systematically eroded social studies education (the curricular home of ML education) and research[15] (Pirtle, 2021). At the same time, a culture of rugged individualism dictates that adults should be able to gain and exchange contemporary knowledge, skills, and abilities independently through higher education (which most do not reach)[16] and the labor market. The former justifies the lack of institutionalized infrastructure dedicated to lifelong learning, while the latter ignores the highly unequal distribution of low-wage vs. high-wage work and the technological and social affordances of each. These expectations become more entrenched against the backdrop of predominantly privatized health care and information systems.

The scoping review reveals that among all nations that have conducted *any* type of MHL study, the United States is the only one that does not offer universal coverage of basic health care services. In fact, the United States is the only industrialized nation without universal health insurance, with 43% of adults underinsured, including 10% who lack any insurance (Collins, Haynes, & Masitha, 2022).[17] Accordingly, the United States spends significantly more on health care than any other developed country. The design and execution of extant HL measures reflect the system's cost-driven aims, including a focus on the costs associated with low HL, such as greater emergency-room visits, longer hospital stays, and higher rates of readmission (Baker, 2006; Shahid et al., 2022). Unsurprisingly, much of this work has been supported by pharmaceutical and health insurance companies, including the development of one of the most widely used clinical HL screeners in the United States (Newest Vital Sign), which was developed by Pfizer (Pfizer Inc., 2011).

At the same time, the U.S. media system operates as an oligopoly with little to no regulatory oversight, particularly as it pertains to digital media and technology—both of which have been shown to profit from information ecosystems rife with mis/disinformation (Ruiz, 2023). Unlike many European countries, the Internet itself is not publicly owned or regulated as a utility. Among the eight nations where any MHL study has been conducted, the United States is the only one without any federal regulations or substantial financial investments in place to combat mis/disinformation[18] (Poynter Institute, 2019).

These socioeconomic trends, many of which extend beyond the United States, are also relevant to understanding the overwhelming lack of measurements more broadly (RQ2). As touched on, performance-based measurements of durable skills like critical thinking are more costly and time-consuming to develop, conduct, analyze, and scale. Additionally, measurements grounded in a social theory of literacy include interconnected variables—such as health insurance status, socio-economic status, and social networks—that can be challenging to isolate and control when designing correlational and explanatory studies. Lastly,

[15] This in turn worsens the already siloed nature of academic research, which structurally disincentivizes interdisciplinary work, such as that needed on MHL (Mäkinen, Evans, & McFarland, 2024).

[16] Over 60% of American adults 25 and older do not have a four-year degree; 10% of those lack a high school diploma or equivalent (Pew Research Center, 2022).

[17] Of all high-income countries, the United States has the highest death rate for avoidable or treatable conditions.

[18] Four of those nations, however, have severe restrictions on press freedom: Iran, China, Egypt and Israel. This complicates the ethical and regulatory motivations.

a core feature of ML is its fluctuation over time, which makes narrow measurements at a single point in time limited in their reliability over the decades-long span of working adulthood.

Despite these challenges, advancing research efforts to better understand the experiences, assets, and limitations of the "missing middle" presents a high-impact area of study as it pertains to susceptibility to health mis/disinformation, informed decision-making, and population health. Not only are there untapped opportunities for directly improving the health and well-being of working-age adults, but there are also knock-on effects for those in their immediate networks. In intergenerational households, working-age adults with children serve as early models of lifelong MHL practices such as critical inquiry, as well as key informational gateways for elder dependents. Beyond implicit modeling, they are also often the primary health decision-makers for their dependents and are empowered to make vital decisions on their behalf. More so among working-age adults than any other age group, the outcomes of their decisions have ripple effects far beyond their health, impacting generations before and after them.

Future Research Directions

An important first step is gaining a deeper conceptual understanding of how and why ML and sub-literacies such as AMHL shape health behaviors and outcomes. Toward this end, the first codified definition of AMHL and 17 associated competencies and practices have been presented in a manner that lend themselves to mixed-measurement designs. A unifying theoretical model was also offered, positioning ML as a social determinant of health. Future research may use both to make inroads in our understanding, measurement, and social advancement of MHL among adults. Specifically, the scoping and rapid reviews reveal several areas of focus moving forward.

At a rudimentary level, there is a need for studies that rely on representative samples of adults in their "prime working years" (30–54). In light of the discussed sampling challenges, one avenue could be the utilization of public voting records, which offer a relatively low-cost option that is customizable by geographic region. Additional MHL research would benefit from a more robust set of methods, including interviews with underrepresented demographics (e.g., adults without a four-year degree); longitudinal data to capture MHL across the lifespan; and surveys to quantify MHL among adults. To do so, a methodological line of research with a validated composite measure of AMHL would enable correlational studies similar to those linking adolescent ML to specific behaviors, such as smoking, or HL measures with clinical outcomes.

Looking ahead, these efforts can also generate the type of data needed to elevate media and health education in the political arena. If we look at the long-embattled ML movement in the United States, we see ongoing resistance to media education (Baker, Faxon-Mills, Huguet, Pane, & Hamilton, 2021; Sailer, 2022). Every year, states introduce legislation pertaining to media education curricula, and every year, they fail to pass. Of those that make inroads, data on the scope and impact of the issue are at the forefront. Notably, nearly every state that drafted ML legislation in the past eight years relied on data from *one* 2016 study that found that 82% of Stanford students were unable to distinguish advertisements from news stories (Wineburg & McGrew, 2016). While quantitative data alone offer an incomplete picture, they help transcend partisan anecdotes and play an influential role in the decision making of appropriation committees.

Limitations

Limitations of the scoping review include a search strategy that excludes non-English studies. There may exist MHL studies conducted in other languages. Additionally, the total number of eligible articles included in the scoping review analysis was lower than expected. Multiple measures were taken to address this and to ensure an inclusive yet relevant sample. The fact that the final sample comprises 20 articles is quite revealing and accomplishes one of the primary goals of a scoping review, which is to serve as a preliminary assessment of the potential size and scope of the available research literature. Future scoping reviews could expand to non-peer-reviewed sources, as well as the inclusion of broader allied constructs in their search strings. Despite these limitations, the scoping review provides a valid assessment of the MHL research landscape and highlights opportunities for impact-driven research and practice.

References

Afshar, P. P., Keshavarz, F., Salehi, M., Moghadam, R. F., Khajoui, E., Nazari, F., & Dehghan, M. (2020). Health literacy and media literacy: Is there any relation? *Community Health Equity Research & Policy, 42*(2), 195–201. doi:10.1177/0272684x20972642

American Academy of Dermatology. (2024). *Survey shows Gen Z adults at risk for skin cancer due to increasing rates of tanning and burning*. American Academy of Dermatology. Retrieved from https://www.prnewswire.com/news-releases/american-academy-of-dermatology-survey-shows-gen-z-adults-at-risk-for-skin-cancer-due-to-increasing-rates-of-tanning-and-burning-302145026.html

Anter, A. (2022). News/entertainment social media engagement and social media health literacy: Effects on mental health and coping during COVID-19 lockdown. *Online Journal of Communication and Media Technologies, 12*(4). doi:10.30935/ojcmt/12615

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19–32. doi:10.1080/1364557032000119616

Baker, D. W. (2006). The meaning and the measure of health literacy. *Journal of General Internal Medicine, 21*(8), 878–883. doi:10.1111/j.1525-1497.2006.00540.x

Baker, G., Faxon-Mills, S., Huguet, A., Pane, J., & Hamilton, L. (2021). *Approaches and obstacles to promoting media literacy education in U.S. schools*. Santa Monica, CA: RAND Corporation.

Bejaković, P., & Mrnjavac, Ž. (2020). The importance of digital literacy on the labour market. *Employee Relations, 42*(4), 921–932. doi:10.1108/er-07-2019-0274

Bergsma, L. J. (2004). Empowerment education: The link between media literacy and health promotion. *American Behavioral Scientist, 48*(2), 152–164. doi:10.1177/0002764204267259

Bergsma, L. J., & Carney, M. E. (2008). Effectiveness of health-promoting media literacy education: A systematic review. *Health Education Research, 23*(3), 522–542. doi:10.1093/her/cym084

Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcomes: An updated systematic review. *Annals of Internal Medicine, 155*(2), 97–107. doi:10.7326/0003-4819-155-2-201107190-00005

Bigsby, E., & Hovick, S. R. (2018). Understanding associations between information seeking and scanning and health risk behaviors: An early test of the structural influence model. *Health Communication, 33*(3), 315–325. doi:10.1080/10410236.2016.1266575

Buckingham, D. (2003). *Media education: Literacy, learning and contemporary culture*. Cambridge, UK: Polity Press.

Bursztyn, L., Rao, A., Roth, C., & Yanagizawa-Drott, D. (2020). *Misinformation during a pandemic* (Working Paper No. 27417). Cambridge, MA: National Bureau of Economic Research. doi:10.3386/w27417

Caceres, M. M. F., Sosa, J. P., Lawrence, J. A., Sestacovschi, C., Tidd-Johnson, A., Rasool, M. H. U., . . . Fernández, J. P. (2022). The impact of misinformation on the COVID-19 pandemic. *AIMS Public Health, 9*(2), 262–277. doi:10.3934/publichealth.2022018

Canady, B. E., & Larzo, M. (2022). Overconfidence in managing health concerns: The Dunning-Kruger effect and health literacy. *Journal of Clinical Psychology in Medical Settings, 30*(2), 460–468. doi:10.1007/s10880-022-09895-4

Centers for Disease Control and Prevention. (2023). *What is health literacy?* Retrieved from https://www.cdc.gov/health-literacy/php/about/?CDC_AAref_Val=https://www.cdc.gov/healthliteracy/learn/index.html

Collins, S., Haynes, L., & Masitha, R. (2022). *The state of U.S. health insurance in 2022*. New York, NY: Commonwealth Fund. doi:10.26099/73zg-3432

Coughlin, S. S., Vernon, M., Hatzigeorgiou, C., & George, V. (2020). Health literacy, social determinants of health, and disease prevention and control. *Journal of Environment and Health Sciences, 6*(1). Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/33604453

Gisondi, M. A., Barber, R., Faust, J. S., Raja, A. S., Strehlow, M., Westafer, L. M., & Gottlieb, M. (2022). A deadly infodemic: Social media and the power of COVID-19 misinformation. *Journal of Medical Internet Research, 24*(2), 8–14. doi:10.2196/35552

Grizzle, A., Wilson, C., Tuazon, R., Cheung, C. K., Lau, J., Fischer, R., . . . Gulston, C. (2021). *Media and information literate citizens: Think critically, click wisely!* Paris, France: United Nations Education, Scientific and Cultural Organization. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000377068

Gross, M., & Latham, D. (2011). What's skill got to do with it?: Information literacy skills and self-views of ability among first-year college students. *Journal of the American Society for Information Science and Technology, 63*(3), 574–583. doi:10.1002/asi.21681

Hargittai, E. (2005). Survey measures of web-oriented digital literacy. *Social Science Computer Review, 23*(3), 371–379. doi:10.1177/0894439305275911

Hargittai, E., & Hsieh, Y. P. (2011). Succinct survey measures of web-use skills. *Social Science Computer Review, 30*(1), 95–107. doi:10.1177/0894439310397146

Hargittai, E., Piper, A. M., & Morris, M. R. (2018). From internet access to internet skills: Digital inequality among older adults. *Universal Access in the Information Society, 18*(4), 881–890. doi:10.1007/s10209-018-0617-5

Herdzina, J., & Lauricella, A. R. (2020). *Media literacy in early childhood report*. Chicago, IL: Erikson Institute. Retrieved from https://www.erikson.edu/wp-content/uploads/2021/06/TEC-MediaLiteracy-Report.pdf

Higgins, J., & Begoray, D. (2012). Exploring the borderlands between media and health: Conceptualizing "critical media health literacy." *Journal of Media Literacy Education, 4*(2), 136–148. doi:10.23860/jmle-4-2-4

Hobbs, R. (2011). The state of media literacy: A response to Potter. *Journal of Broadcasting & Electronic Media, 55*(3), 419–430. doi:10.1080/08838151.2011.597594

Hobbs, R., & Frost, R. (2003). Measuring the acquisition of media-literacy skills. *Reading Research Quarterly, 38*(3), 330–355. doi:10.1598/rrq.38.3.2

Huguet, A., Kavanagh, J., Baker, G., & Blumenthal, M. (2019). *Exploring media literacy education as a tool for mitigating truth decay*. Santa Monica, CA: RAND Corporation.

Hung, S., Yang, S., & Luo, Y. (2021). New media literacy, health status, anxiety, and preventative behaviors related to COVID-19: A cross-sectional study in Taiwan. *International Journal of Environmental Research and Public Health, 18*(21), 11247. doi:10.3390/ijerph182111247

Jakubowicz, A. (2007). Chapter 13: The media and social cohesion. In J. Jupp, J. Nieuwenhuysen, & E. Dawson (Eds.), *Social cohesion in Australia* (pp. 158–169). Oxford, UK: Cambridge University Press. doi:10.1017/CBO9780511481574.015

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robison, A. J. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge, MA: The MIT Press.

Kaiser Family Foundation. (2023). *KFF health misinformation tracking poll pilot*. Retrieved from https://files.kff.org/attachment/Topline-KFF-Health-Misinformation-Tracking-Poll-Pilot-August-2023.pdf

Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2003). *The health literacy of America's adults: Results from the 2003 national assessment of adult literacy.* Washington, DC: National Center for Education Statistics, U.S. Department of Education.

Leu, D., Forzani, E., Burlingame, C., Kulikowich, J., Sedransk, N., Coiro, J., & Kennedy, C. (2013). Chapter 16: The new literacies of online research and comprehension: Assessing and preparing students for the 21st century with common core state standards. In S. Neuman & L. Gambrell (Eds.), *Quality reading instruction in the age of common core standards* (pp. 219–236). Newark, DE: International Reading Association.

Levin-Zamir, D., Lemish, D., & Gofin, R. (2011). Media health literacy (MHL): Development and measurement of the concept among adolescents. *Health Education Research, 26*(2), 323–335. doi:10.1093/her/cyr007

Li, W., Zhang, Y., Liang, J., & Yu, H. (2023). Psychometric evaluation of the Chinese version of the media health literacy questionnaire: A validation study. *Digital Health, 9*. doi:10.1177/20552076231203801

Liu, C., Wang, D., Liu, C., Jiang, J., Wang, X., Chen, H., . . . Zhang, X. (2020). What is the meaning of health literacy? A systematic review and qualitative synthesis. *Family Medicine and Community Health, 8*(2), e000351. doi:10.1136/fmch-2020-000351

Livingstone, S., Couvering, E. V., & Thumim, N. (2005). *Adult media literacy: A review of the research literature*. London, UK: Ofcom. Retrieved from https://www.semanticscholar.org/paper/Adult-Media-Literacy%3A-A-Review-of-the-Research-Livingstone-Couvering/d6df537795ac8add46922f2ca3e617be9a3ec20f

Lopez, C., Kim, B., & Sacks, K. (2022). Health literacy in the United States: Enhancing assessments and reducing disparities. *Social Science Research Network*. doi:10.2139/ssrn.4182046

Mahmood, K. (2016). Do people overestimate their information literacy skills? A systematic review of empirical evidence on the Dunning-Kruger effect. *Communications in Information Literacy, 10*(2), 198–213. doi:10.15760/comminfolit.2016.10.2.24

Mäkinen, E. I., Evans, E. D., & McFarland, D. A. (2024). Interdisciplinary research, tenure review, and guardians of the disciplinary order. *The Journal of Higher Education, 96*(1), 54–81. doi:10.1080/00221546.2024.2301912

Mamedova, S., & Pawlowski, E. (2018). *A description of U.S. adults who are not digitally literate*. Washington, DC: U.S. Department of Education.

Martens, H., & Hobbs, R. (2015). How media literacy supports civic engagement in a digital age. *Atlantic Journal of Communication, 23*(2), 120–137. doi:10.1080/15456870.2014.961636

Media Literacy Now. (2024). *Defining media literacy*. Retrieved from https://medialiteracynow.org/what-is-media-literacy-what-is-digital-literacy-what-is-information-literacy-what-is-news-literacy-what-is-digital-citizenship/

Nan, X., Wang, Y., & Thier, K. (2022). Why do people believe health misinformation and who is at risk? A systematic review of individual differences in susceptibility to health misinformation. *Social Science & Medicine, 314*, 115398. doi:10.1016/j.socscimed.2022.115398

National Institutes of Health. (2024). *Health literacy tool shed*. U.S. Department of Health and Human Services. Retrieved from https://healthliteracy.tuftsmedicine.org/

Nazarnia, M., Zarei, F., & Rozbahani, N. (2022). Development and psychometric properties of a tool to assess media health literacy (MeHLit). *BMC Public Health, 22*(1). doi:10.1186/s12889-022-14221-6

Nutbeam, D. (2008). The evolving concept of health literacy. *Social Science & Medicine, 67*(12), 2072–2078. doi:10.1016/j.socscimed.2008.09.050

Nutbeam, D., McGill, B., & Premkumar, P. (2017). Improving health literacy in community populations: A review of progress. *Health Promotion International, 33*(5), 901–911. doi:10.1093/heapro/dax015

Office of the Surgeon General. (2025). *Confronting health misinformation*. U.S. Department of Health & Human Services. Retrieved from https://www.hhs.gov/surgeongeneral/priorities/health-misinformation/index.html

Organization for Economic Co-operation and Development. (n.d.). *Employment rate by age group*. Retrieved from https://www.oecd.org/en/data/indicators/employment-rate-by-age-group.html

Pennycook, G., Bago, B., & McPhetres, J. (2023). Science beliefs, political ideology, and cognitive sophistication. *Journal of Experimental Psychology General, 152*(1), 80–97. doi:10.1037/xge0001267

Pew Research Center. (2022). *Key facts about U.S. college graduates*. Retrieved from https://www.pewresearch.org/short-reads/2022/04/12/10-facts-about-todays-college-graduates/

Pfizer Inc. (2011). *The Newest Vital Sign.* Retrieved from https://www.pfizer.com/products/medicine-safety/health-literacy/nvs-toolkit

Pirtle, Z. (2021). Social science for what? Battles over public funding for the "other sciences" at the National Science Foundation. *Journal of Responsible Innovation, 8*(1), 127–131. doi:10.1080/23299460.2021.1907045

Potter, J., & McDougall, J. (2017). *Digital media, culture and education*. London, UK: Palgrave Macmillan London.

Potter, W. (2004). *Theory of media literacy: A cognitive approach*. Thousand Oaks, CA: Sage Publishing.

The Poynter Institute. (2019). *A guide to anti-misinformation actions around the world.* Retrieved from https://www.poynter.org/ifcn/anti-misinformation-actions/

Ruiz, C. D. (2023). Disinformation on digital media platforms: A market-shaping approach. *New Media & Society*. doi:10.1177/14614448231207644

Sailer, J. (2022). *CRT in practice, the parents' bill of rights, and social media literacy*. Civics Alliance. Retrieved from https://civicsalliance.org/crt-in-practice-the-parents-bill-of-rights-and-social-media-literacy/

Scheiber, R., Karmasin, M., & Diehl, S. (2023). Exploring the Dunning-Kruger effect in health communication. *Journal of Health Communication, 28*(11), 707–727. doi:10.1080/10810730.2023.2258085

Shahid, R., Shoker, M., Chu, L. M., Frehlick, R., Ward, H., & Pahwa, P. (2022). Impact of low health literacy on patients' health outcomes: A multicenter cohort study. *BMC Health Services Research, 22*(1). doi:10.1186/s12913-022-08527-9

U.S. Department of Health and Human Services. (n.d.). *Social determinants of health*. Retrieved from https://odphp.health.gov/healthypeople/priority-areas/social-determinants-health

Vahedi, Z., Sibalis, A., & Sutherland, J. E. (2018). Are media literacy interventions effective at changing attitudes and intentions towards risky health behaviors in adolescents? A meta-analytic review. *Journal of Adolescence, 67*(1), 140–152. doi:10.1016/j.adolescence.2018.06.007

Wang, X., & Cohen, R. A. (2023). *Health information technology use among adults: United States, July–December 2022*. Hyattsville, MD: National Center for Health Statistics.

Wineburg, S., & McGrew, S. (2016). *Evaluating information: The cornerstone of civic online reasoning*. Stanford, CA: Stanford History Education Group.

World Health Organization. (2019). *Social determinants of health*. Retrieved from https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1