Yoo Kyung Chang, Shannon Suiru Lei and Xiaoyi Gabby Zhou

Critical Media Literacy in the Times of Subjective Online Media Consumption

Abstract. Critical Media Literacy (CML) is a complex construct that includes a range of knowledge and skills. Due to its complexity, understanding and studying CML is a difficult challenge, starting with the definition of CML. It is ever more challenging to define and teach CML under the current media ecosystem, where online media consumption is highly subjective and varied. We present a conceptual framework to define and observe the subjective nature of online media consumptions as informed by information sciences and media studies. A multimodal observation of how the participants of our study consumed online media during the spread of the global pandemic was analyzed using the framework. The findings manifest patterns of subjective online media consumption behavior as influenced by individual factors, but not by explicit tasks for media consumption. As such, authors present metaliteracy as an essential skill for individuals to develop subjective and personal CML.

Keywords. Online Media Consumption, Critical Media Literacy, Metaliteracy

Critical Media Literacy in Zeiten des subjektiven Online-Medienkonsums

Zusammenfassung. Critical Media Literacy (CML) ist ein komplexes Konstrukt, das eine Reihe von Kenntnissen und Fähigkeiten umfasst. Aufgrund seiner Komplexität ist es eine große Herausforderung, CML zu verstehen und zu studieren. Es wird immer schwieriger, CML im Kontext des aktuellen Medienökosystems zu definieren und zu lehren, da der Online-Medienkonsum sehr subjektiv und vielfältig ist. Der Beitrag stellt einen konzeptionellen Rahmen vor, um die subjektive Natur des Online-Medienkonsums zu definieren und zu beobachten, der von den Informations- und Medienwissenschaften geprägt ist. Eine multimodale Betrachtung des Online-Medienkonsums von Teilnehmer:innen während der Ausbreitung der globalen Pandemie wurde anhand

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dieses Rahmens analysiert. Die Ergebnisse zeigen, dass das subjektive Online-Medienkonsumverhalten von individuellen Faktoren beeinflusst wird, aber nicht von expliziten Aufgaben für den Medienkonsum. In diesem Sinne stellen die Autorinnen Metaliteracy als eine wesentliche Fähigkeit für Individuen dar, um subjektive und persönliche CML zu entwickeln.

Schlüsselwörter. Online-Medienkonsum, Critical Media Literacy, Metaliteracy

1 Background of the Study

Critical media literacy (CML) is an important skill necessary to make sense of the world we live in. It governs how we process the information about the world around us and make sense of it. Reading media messages critically is a foundation for responsible civic engagement, as we need to scrutinize media makers' intention to frame information for certain audience interpretations. By viewing media messages beyond their face values, deconstructing layers of information for the underlying stereotypes and assumptions (Bass et al. 2022), CML enables us to make informed decisions, maximize life opportunities (Robertson, Hughes 2011), and open up spaces for alternative voices representing marginalized groups to address social problems (Kellner, Share 2005). Despite the importance of supporting CML in education for critical citizenry, scholars found a decline in media education (Mesquita-Romero et al. 2022). Educators have the mission to foster CML in school settings to better prepare students as informed and active citizens in our society.

However, educators have multiple challenges in relation to CML. Teaching and learning CML is a difficult endeavor, especially as CML is defined widely and is constantly changing with the advances in communication technology and media. CML is an interdisciplinary concept with a variety of complex choices and topics that can be included, and educators of different backgrounds and perspectives hold diverse interpretations of CML. Scarcity of time devoted to media literacy education, inequity of educational resources in schools and districts, and external factors from national administrative policies all impact the implementation of media literacy education (NAMLE 2019). Under the changing demand, educators are challenged in developing and practicing effective CML themselves, as well as modeling and supporting the development of CML in their classroom.

This paper will examine news literacy specifically, a component of CML, to provide guidance on how to conceptualize, observe, and approach teaching and learning of CML. With the widespread use of social media, researchers have found that there are fundamental changes to how people consume news across platforms: news consumption is highly subjective (Zeller et al. 2013) as driven by personal goals and preferences; developments in communication technology, such as social media and news aggregators that allow for different modes of online news consumption and participation (Siapera, Veglis 2012; Thorson 2008), targeted news feed, and propaganda led to a new media ecosystem. A recent global study finds that social media is the most popular channel (28 %) where people access news, with smartphones being the device used most often (Newman et al. 2022). In the U.S., 53 % of adults get news from social media platforms (Liedke, Matsa 2022), with more people getting news from smartphone, tablet, and computer (49 %) than from television (31 %) (Forman-Katz, Matsa 2022). In Germany, 32 % of adults get news from social media specifically, and 57 % of adults use smartphones to access news throughout the day (Newman et al. 2022). The design of social media provides users diverse and evolving ways to engage with news. At the same time, it also cultivates an environment that (Mitchelstein, Boczkowski 2010) exacerbates problems such as media echo chambers, polarization, and conspiracy theory (Gretter et al. 2017; Lee et al. 2014; Marwick, Lewis 2017; Mason 2013), and exacerbation of fake news and misinformation (Allcott, Gentzkow 2017).

Contrary to the ever-evolving technological landscape, a review of online news consumption research (Mitchelstein, Boczkowski 2010; Steensen et al. 2019) shows that current methods of study have significant limitations in drawing effective understanding of the practice. For example, there is a need to consider the interaction between media design features and social practices, patterns of online news consumptions, and the collective news production between journalists and consumers (Bentley et al. 2007; Boczkowski 2004; Deuze 2003; Pavlik 2000; Russell 2007), and diversification of methods and approaches to observation (Moller et al. 2019).

In order to better understand how news consumers develop their understanding of the world through online news platforms, and to inform media literacy education and policy, researchers, especially in the United States, have called for new approaches, which includes alternate methods of observation and analysis to conceptualize and interpret their behavior given the qualitative differences, to study online news consumption beyond traditional means of research (Mitchelstein, Boczkowski 2010; Siapera, Veglis 2012; Tewksbury 2003; Zeller et al. 2013).

2 Research Questions

This paper examines the following research questions to address the challenges of lack of conceptual framework and methodology in understanding and conceptualizing complex and subjective online media consumption behavior. The goal is to inform the definition and design of the CML curriculum and objectives by identifying important factors that influence online media consumption behavior.

1. Given the changing landscape of media ecosystem and media consumption behavior, what are the important factors to consider when understanding online media consumption across platforms and sources?
2. How do the contextual and individual factors influence different types of media consumption behavior across online media platforms?

The first research question was addressed through literature review which led to a development of a conceptual framework that identifies and aggregates important factors to consider as part of CML. The second research question was explored through a study where participants' online news consumption behaviors were observed.

3 Literature Review

3.1 Subjective Online Media Consumption

The proliferation of social media as the dissemination platform for online news has two large implications on Critical Media Literacy (CML). One, media consumption behavior is influenced by multiple factors that lead to varied but subjective patterns of consumption behavior (Mitchelstein, Boczkowski 2010). These may include individual factors, such as demographics, goal, and motivation towards consumption, sociocultural factors, source and platform characteristics as well as one's perception towards them. There is also qualitatively different behavior that can be observed in online news consumption due to changes in the definition of news and personalization of news consumption, warranting the need to study subjective dimensions of news consumption (Zeller et al. 2013). In terms of CML, recognizing such subjective and varied paths in accessing and interpreting information about the world around us is an important skill. Another implication for CML is that as a consumer of online media, one is not just a passive user but a contributor to how online media is shared and disseminated through these platforms (Mitchelstein, Boczkowski 2010). An individual may passively participate in the role whereby simple actions of reading and scanning through media

influence algorithmic feed that impacts dissemination through their social networks, or actively participate by sharing, saving, or commenting on the media (Duffy, Ang 2019). In such a way, consumers of media are simultaneously involved in developing and shaping the media environment. Being critically media literate requires that they understand and are mindful of such impact that they themselves and others have on their meaning making process.

3.2 Development of Conceptual Framework

While there has been much discussion on the needs to identify and observe varied factors that lead to subjective online media consumption (Boczkowski, Mitchelstein 2017; Duffy, Ang 2019; Lewis, Westlund 2015), there is little consensus on this theoretical debate (Steensen et al. 2019). In response to such needs, the first research question asks, "What are the important factors to consider when understanding online media consumption across platforms and sources?". A conceptual framework was developed to identify important factors that influence news consumption behavior and observable behaviors characteristic of online media platforms. Suggestions from previous studies on subjective and varied context of news consumption (Zeller et al. 2013), consumption across platforms and medium (Mitchelstein, Boczkowski 2010), complex and changing characteristics of the media and their influence on sociocultural context of news consumption (Siapera, Veglis 2012) were considered.

Largely two sources of literature informed the design of the conceptual framework. One was Wilson and Walsh's (1996) information behavior model selected for its comprehensiveness and extensive empirical support. It is revised to integrate the varied nature of individualized consumption behavior and characteristics of media platforms. Second was Meijer and Kormelink's (2015) definition of digital news behavior, which was synthesized into the framework. Providing a framework to understand high-level information processes, Wilson's model contextualizes media consumption by framing them within the environmental, psychological, and social context. Meijer and Kormelink's (2015) list of behaviors add manifestations of information processing on the behavioral level.

3.3 Online Media Consumption – A Conceptual Framework

We developed the Online Media Consumption Behavior (OMCB) framework (Fig. 1) to include factors and behaviors found to be important in online media consumption as identified in the fields of information sciences, and media and

communication studies. The purpose of the framework was to provide a systematic framework to guide the observation and understanding of online media behavior, which can be widely varied amongst individuals, by identifying relevant factors, behaviors, and their relationships. The framework can also be used to evaluate critical media literacy through definition of important competencies that contribute to online media consumption behavior and inform the teaching of CML.

Online Media Consumption Behavior (OMCB) Framework

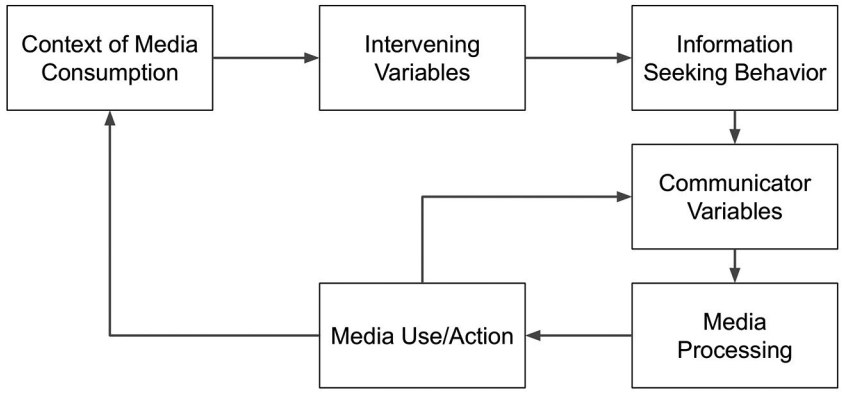


Figure 1: Online Media Consumption Behavior (OMCB) Framework.

The resulting framework consists of six factors and each factor consists of observations as presented in the Appendix. The framework assumes that news consumption behavior goes through iterative cycles to capture the behavior that is varied in complexity, frequency, and duration across participants.

3.4 Multimodal Observation of Online Media Consumption

Traditional approaches to studying media consumption behavior are often limited to self-report surveys or interviews, journals (Moller et al. 2019), or behavioral data alone. These approaches are limited in providing data and observation of relevant factors and consumption behavior; they also lack triangulation across self-report, qualitative observation, and objective measures. As such, researchers have called for different approaches to study online media consumption beyond traditional means of research including alternate methods of observation and analysis to conceptualize and interpret behaviors given the qualita-

tive differences (Mitchelstein, Boczkowski 2010; Siapera, Veglis 2012; Tewksbury 2003; Zeller et al. 2013).

To observe and understand qualitatively different nature of online media consumption behavior across platforms and media (Mitchelstein, Boczkowski 2010) and subjective dimensions of media consumption (Zeller et al. 2013), an integrated, multimodal approach was developed for the study. With the increased number of online media consumers and ease of collecting behavioral data through online platforms, it has become easier to collect precise information on the media consumption behavior beyond traditionally used subjective means (Moller et al. 2019). Online media consumption was captured through video screen capture of the behavior along with audio annotation for triangulation. By combining direct observation of what participants actually do with their self-report of what was going through their mind during the manifest behavior, researchers can interpret behaviors that may sometimes be difficult to distinguish from observation alone. While there are known limitations of introspection and self-report measures, the articulation of one's thought through think-aloud protocol may reveal additional details of the behavior that may not be observable through behavioral manifestation. The mixed-methods approach to triangulate the objective measure of the consumption behavior and subjective, self-reported account of the cognitive processes can be efficient in that it requires very little effort and technical skills from the participants, but provides rich data for the observation of media consumption behavior.

4 Methods

How do contextual and individual factors influence different types of media consumption behavior across online media platforms? In order to address the second research question, online news consumption behavior was captured through multimodal methods and analyzed through the conceptual framework of online media consumption behavior (OMCB).

4.1 Participants

Participants were recruited by posting flyers in social media platforms, including Facebook, Instagram and WeChat, on bulletin boards in public spaces such as public libraries, university campuses, and restaurants for in-person protocol in a metropolitan city in the United States. Online participants were recruited through Amazon Mechanical Turk (MTurk), a platform often used for remote

empirical studies. In total, 59 participants completed the study, with 24 in-person and 35 MTurk participants.

4.2 Procedure

Data collection was conducted within a span of five months, between October 2019 to March 2020. This provided us with an unanticipated factor that influenced online news consumption, the spread of the global pandemic. Data was collected using the same procedure either in-person or online using MTurk. A protocol was developed to ensure consistency of the data collection process, with the only difference being the modality (in-person vs. online). Participants were first asked to share their demographic information, news value, and their location. Then, participants were asked to engage in five minutes of online news interaction activities as they naturally would, and record their screen during the process. After the screen capture, participants were prompted with questions and asked to provide audio annotation while playing their five minutes of news interaction activities. The annotation was inspired by photo elicitation method (Harper 2002) to capture participant's self-reported thought processes while minimizing the cost of cognitive load, which may be implicated with think-aloud protocol. The self-reported measure would reveal what the participants perceived and remembered as their cognitive processes behind their behavioral engagement with the online media, providing further explanation for their subjective decisions and experience. After audio annotation, participants were asked about their general news consumption behaviors. Of the 59 participants, 8 participants (all recruited through MTurk) were given an additional task to examine how the global pandemic might influence their online news consumption behavior. Once they completed the protocol as everyone else, they were additionally asked to search specifically for the latest COVID-19 news.

4.3 Independent Measures

Age Demographic information such as age has been found to influence one's choice of platform or source of news (Tewksbury 2003). Participants' age group was collected to examine possible relationships with their online consumption behavior.

Relevance to Global Crisis During data collection, the global pandemic began spreading throughout the world. Due to the unforeseen factors, participants fell naturally into two groups based on their perception of personal impact from

the crisis, one were participants whose immediate community had not yet been affected by the pandemic and they did not report any perception of threat (N = 26) and the other from the community that was directly affected by the pandemic or self-reported impact of the pandemic (N = 33).

News Value While there is no accepted definition of news, news value is used as a way to define the characteristics of news by reflecting what is believed to be important qualities of news (Harcup, O'Neill 2017). News values are used to examine gatekeeping in traditional media, as well as individual news consumption. Participants were asked to define news and their response were coded into 18 news values based on Harcup and O'Neill (2017)'s list of news values: exclusivity, bad news, conflict, surprise, audio-visuals, shareability, entertainment, drama, follow-up, power elite, relevance, magnitude, celebrity, good news, news organization's agenda, immediacy, novelty, and being informed. News values were examined as individual factors in relation to their online news consumption behavior.

4.4 Dependent Measures

Dependent measures were collected to reflect different patterns of online news consumption behavior to examine their relationship with individual characteristics as previous studies have found (Tewksbury 2003).

Online News Consumption Behavior was coded according to the rubric as presented in the Appendix. Video capture of the content and interaction of the participants' online news consumption behavior was coded into news seeking (initiating new consumption cycle, read linked article, search related news), news processing, and news use (initiating new consumption cycle, read linked article, search related news) behavior, which was triangulated with the audio annotation.

Source Type Credibility is a factor often used to categorize the type of news source. Traditional news outlets value objectivity and reliability of their product, whereas non-mainstream media sources may include opinions and likely disseminate biased information ("The Ohio State University Pressbooks", n. d.). The sources that participants engaged with were coded into the two source types: verifiable and non-verifiable sources.

Platform Type Search engine, social media, and news sites are commonly used to access news (Olmstead et al. 2011) and were used to identify which types of platforms the participants engaged with.

Types of information Atkin (1973) proposed that people seek information for non-instrumental (based on personal interest) and instrumental (knowing how to adapt to the environment) needs. Instrumental needs are particularly relevant during a crisis where uncertainty is high as they guide one's reaction to the changing environment. Content of the news that the participants engaged with were coded into either surveillance or guidance information (Atkin 1973). The coded data was analyzed to examine whether the participants' relevance to global crises related to the type of information they engaged with. Under the changing environment, people seek for surveillance information as cognitive adaptation, to be aware of the extrinsic elements that could potentially put the individual in harm's way. Guidance information is driven by the need for affective adaptation. Guidance information supports individuals to relate and orient one's thoughts and feelings towards the changing environment in a correct or socially appropriate manner (Atkin 1973). Given the subjective nature of online media consumption, participants may be driven by either cognitive or affective needs to gain different types of information on the global crisis as it unfolded.

5 Findings

5.1 Data Analysis

Data was coded using the conceptual framework as the coding scheme in combination of priori and grounded theory coding. Research team coded the subjects' screen recording videos, identifying the observed behavior and variables. Prior to coding, intercoder reliability was calculated amongst the coders for two categories of codes, types of information and the coding scheme, to evaluate the consistency among coders. The percentage of reliability for types of information was 97.44 % and 75.27 % for the coding scheme. The coding scheme was modified to better capture the emerging patterns of behavior. A series of data analysis was conducted to examine the second research question, where we asked "How do the contextual and individual factors influence different types of media consumption behavior across different online media platforms?"

5.2 Finding 1: Depending on the intervening factors, participants show different online news consumption behavior

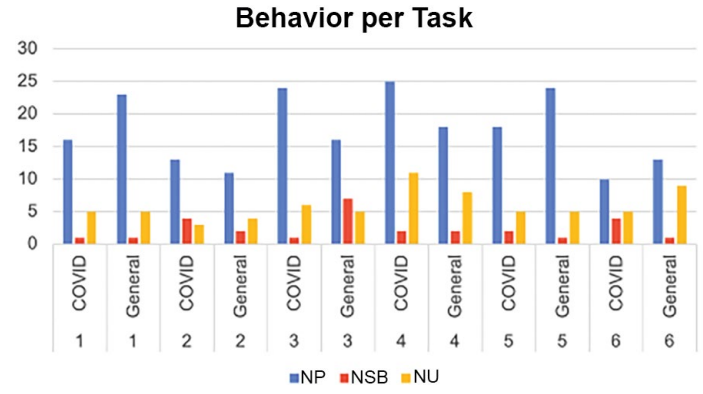
A series of one-way ANOVA analyses were conducted to examine the difference in online news consumption behavior, the types of source and platform accessed by participants based on their *individual factors*, age, and news value. According to One-Way ANOVA conducted with the age group as the independent factor, there was no statistically significant difference in the types of source, platform, or online news consumption behavior. Participants' news value, on the other hand, shows varied differences in how they engaged with online news. Participants who value novelty (something new) in news show a trend of difference ($F(52,1) = 2.9$, $p = 0.09$) by engaging less with new processing behavior ($M = 0.64$) than those who do not value novelty ($M = 0.56$). Participants who value being informed through news show a trend ($F(52,1) = 3.21$, $p = 0.08$) of engaging more with new processing behavior ($M = 0.64$) than those who do not ($M = 0.54$). Participants who value immediacy (immediacy of reporting and information access) engage less with news seeking behavior ($M = 0.15$) compared to those who do not value immediacy ($M = 0.28$) ($F(52,1) = 4.48$, $p < 0.05$). However, they engage more with news use behavior ($M = 0.16$) compared to those who do not value immediacy ($M = 0.1$) ($F(52,1) = 4.57$, $p < 0.05$). Similarly, participants' news value also showed varied differences in the platforms they access. Participants who value novelty (something new) show statistically significant differences in their use of search engines ($F(51,1) = 5.75$, $p < 0.05$), by accessing search engines more often ($M = 8.45$) than those who do not value novelty ($M = 3.12$). Participants who value agenda (stories that set or fit the news organization's own agenda) consume news sites more often ($M = 13.75$) than those who do not value agenda ($M = 3.76$) ($F(51,1) = 6.12$, $p < 0.05$). Participants who value being informed through news show a trend of difference ($F(51,1) = 2.82$, $p = 0.09$) by engaging less with verifiable sources ($M = 11.89$) than those who did not prioritize being informed ($M = 15.94$).

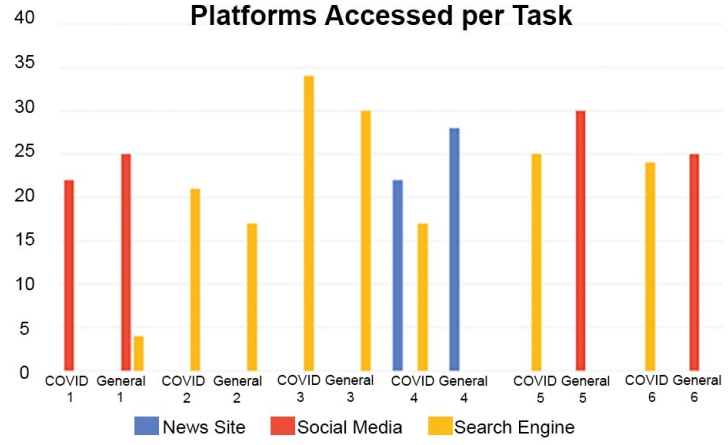
A series of one-way ANOVA was also conducted to examine the difference in online news consumption behavior based on the participant's *environmental factor*, relevance to the global pandemic. One-way ANOVA with relevance as independent variable and average news seeking behavior (proportion of news seeking behavior over overall behavior) as dependent variable shows a trend of difference ($F(52,1) = 2.2$; $p = 0.14$) where participants who were not influenced by the pandemic engaged more with news seeking behavior ($M = 0.28$) than those who were influenced ($M = 0.2$). Participants who were influenced by the pandemic showed statistically significant differences ($F(52,1) = 4.75$; $p < 0.05$) by engaging more with news use behavior ($M = 0.15$) than those who were not affected ($M = 0.09$). No difference was found between the two groups in relation to news processing behav-

ior. Further, there was a trend of difference ($F(52,1) = 8.37$, $p = 0.06$) where the participants influenced by the global crisis ($M = 4.25$) searched for more guidance information than those who were irrelevant ($M = 1.15$).

5.3 Finding 2: Contextual factors do not influence one's online consumption behavior

One-way ANOVA was conducted with eight participants who were given first the general news consumption task followed by a specific task to search for the latest COVID-19 news to examine whether participants consume online news differently based on their goal of news consumption. The result showed no statistically significant difference in the participants' online news consumption behavior, types of source or platforms they engaged with between the two tasks.





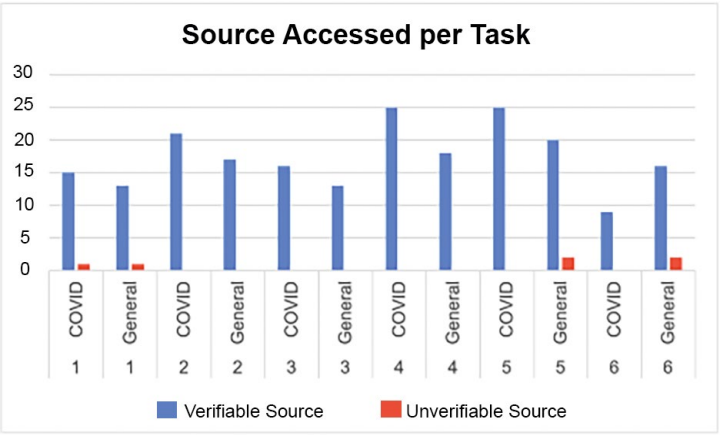


Figure 2: Online News Consumption (behavior, platform, source) organized by participants per task (COVID vs. General).

6 Conclusion

6.1 Challenges of CML Education

While the importance of Critical Media Literacy (CML) in developing informed citizens is widely accepted, there is a decline in teaching and learning of CML in an educational context (Mesquita-Romero, Fernández-Morante, Cebreiro-López 2022). There may be multiple reasons associated with such decline, but one of the challenges lies in the complexity and difficulty in defining CML. Historically, how to conceptualize CML skills and the component literacies has been a challenging endeavor, especially with the evolution of media technologies that constantly requires new skills to navigate and make sense of the world through them. Current media ecosystem is further complicating how one engages with online media and what factors drive such behavior, leading to varied and subjective patterns of consumption behavior. In defining what competencies should be fostered through CML and to design curriculum around them, understanding these factors and their influence is important.

In response, the paper examined two research questions, to identify important factors involved with online media consumption behavior and to understand how the contextual and individual factors influence different types of consumption behavior across different online media platforms. An online media consumption behavior (OMCB) framework was developed to provide a foundation

to define, educate, and observe the practice of CML with online media. As per researchers suggestions for interdisciplinary approach across computer science, information science (Boczkowski, Mitchelstein 2017; Steensen et al. 2019), social sciences, and journalism to take qualitatively different approaches to identify the unique and diverse interplay between media characteristics and news consumers (Lewis, Westlund 2015; Siapera, Veglis 2012; Zeller et al. 2013), OMCB framework integrates research from information sciences and digital journalism to identify online media consumption behavior and the important factors that influence the behavior, and accounts for the characteristics of the new media ecosystem (Couldry et al. 2007; Lewis, Westlund 2015; Siapera, Veglis 2012).

The relationships between contextual and individual factors and online media consumption behavior were examined through multimodal observation of online news consumption behavior and analyzed through the OMCB framework. The results show that individual factors such as news value and environmental factors such as global pandemic are related to different online media consumption behavior, including the type of source and platforms engaged. However, explicit goals of the media consumption task do not show any difference in the type of source or platform participants access, nor the media consumption behavior they engage with.

The result confirms the subjective nature of online media consumption. Participants' online consumption behavior was related to individual and environmental factors, as opposed to objectively exhibiting no preference or pattern. Interestingly, having a particular goal for news consumption did not change their strategy and behavior. Instead, they manifested the same, subjective media consumption behavior despite the explicit goal at hand. This may be explained by what researchers call media habits, a subjective and implicit pattern of media consumption behavior that dictates one's consumption behavior.

One of the challenges of CML education is that different factors have influence on how and why one may choose a source, media platform, or the type of media they access. Development of digital devices expands the choices for people to consume news and drastically changes media consumption behaviors (Mrah 2022). People form media consumption habits driven by subjective and socially mediated credibility and trust for the media source and platform, as well as implicit heuristics (Mrah 2022). As people increasingly turn to social media and search engines to seek information, media consumers' relationship with traditional media organizations are disrupted. The ever-changing media consumption habits pose a challenge of how news consumers can effectively retrieve trustworthy information as informed by CML skills. Awareness of the complexity and subjec-

tive nature of online media consumption will be important in developing CML. Further, awareness and monitoring of implicit factors such as one's preference, familiarity, and habit that drive one's media literacy practice is difficult, especially as they are not easily subjected to our explicit examination or reflection.

6.2 Metaliteracy as a Foundational Skill for CML

Due to varied and complex patterns of online media consumption, being critically media literate requires cognitive and metacognitive skills to understand and apply appropriate strategies to effectively navigate and make sense through online media. Metaliteracy refers to multiple literacies that promote critical thinking and participation in the online media ecosystem (Mackey, Jacobson 2011), as well as the metacognitive awareness and skills to recognize one and others' practice of such literacies (Mackey, Jacobson 2014). While media literacy pertains to the cognitive aspect of literacy practice, metacognitive metaliteracy allows one to examine their own online media consumption behavior such as the choices and the assumptions they make on a behavioral level as well as implicit cognitive level. CML education, therefore, should not only focus on fostering the development of cognitive strategies to effectively navigate the online media ecosystem, but metacognitive skills to monitor and regulate one's cognitive and affective processes that drive such behavior. Further, CML should include social metacognition, recognition and practice that metacognition is a sociocultural practice (Jost et al. 1998), that our beliefs and knowledge also stems from our metacognitions about other people and our collective, cultural practices. Current study did not examine the participant's media literacy nor metaliteracy, but exploring one's online media consumption behavior in relation to these competencies would further expand our understanding of the needed competencies and how to support them.

Then, how do we practice and support metaliteracy? Jacobson and Mackey (2013) proposed seven essential elements in gaining metaliteracy. The essence in becoming metaliterate is to consciously practice critical thinking and to engage in the digital participatory environment. To be a critical media consumer, information quality should be evaluated independent of its delivery format, design of the platform, and metadata associated with the information such as comments. Critical thinking should be extended beyond the information itself with recognition of how information is generated and presented to meet the needs of the consumer. To learn to adapt to the evolutionary digital realm, individuals should also be an active contributor to the digital world by producing and sharing content in different media formats (Jacobson, Mackey 2013), a process

that helps individuals understand media formats and its impact on the content. Lastly, understanding of ethical practice in the digital realm, especially on issues around privacy and property, is important. The OMCB framework can be used to guide the endeavor to develop social, metacognitive metaliteracy by identifying the necessary skills and knowledge in relation to the factors that influence media consumption behavior.

7 Implications and Limitations

While traditional approaches to define and teach CML may be limited in capturing multiple factors that influence one's online media consumption behavior and necessary literacies to navigate these factors, Online Media Consumption Behavior (OMCB) framework provide a foundation of personal, contextual, and media factors that influence online media consumption behaviors. Becoming proficient with CML skills requires that one understands the complexity of factors that influence online media consumption behavior as identified by the OMCB framework. Further, in order to be critically media literate, one should be able to monitor and regulate multiple literacies, metaliteracy, and their role in participating and impacting the online media ecosystem.

While the conceptual framework and multimodal observation led to observation of subjective patterns of news consumption behavior, a few limitations emerged from a methodological perspective. When sharing their online consumption through social media, which some consider a personal space, a few participants raised concerns for possible invasion of privacy. This may have limited their news consumption behavior overall. Also, some of the news consumption behaviors and internal factors were difficult to observe or distinguish using direct observation and self-report. Unless the participants explicitly annotated, it may be difficult to capture which of the multiple content they were attending to. Also, distinguishing between news seeking and processing behaviors may be difficult as newsfeed tends to be provided in bitesize and there is very little temporal and qualitative difference between searching through the gist of news and reading through the entire post. Similarly, it was difficult to distinguish between scanning and snacking behavior. Many of the intervening variables (such as one's trust for news platforms, motivation for the news consumption) cannot be captured through direct observation unless the participants are prompted to share this information or through experimental design. Lastly, since the participants were aware that their news consumption behaviors would be observed, their interactions with the online news, such as liking, sharing, posting comments, might have decreased due to the Hawthorne effect (McCarney et al. 2007). For

example, Sang et al. (2020) in a study of signaling and expressive interactions with online news found more diverse and active interaction with the news platforms and features. While the OMCB may present a framework to define CML as practiced through online media platforms, further validation of the framework may be needed.

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Appendix

Table 1: Factors and Behaviors of Online Media Consumption Behavior (OMCB) Framework

Factors	Observations
Context of Media consumption	Person in context (context of media consumption needs and goals)
Intervening Variables	Psychological (e. g., personal interest, emotion)
There is 'us' on the one side and 'the others' on the other side. The 'us' group represents the 'normal'. 'The others' deviate from the 'normal'.	Demographic (e. g., social group, age)
	Environmental
	Role-relation or interpersonal (credibility, trust)
	Source characteristics
Information Seeking Behavior	Checking (to find out "new" information)
	Monitoring (actively surveying, get ready for actions if needed)
	Searching (looking for an answer to a specific question)
	Viewing (subordination of the activity, a background of the main task)
	Listening (akin to viewing, background)
Communicator Variables	Author and source (Who wrote the original news content)
	Platform design (What actions can you do with the news)

Factors	Observations
	Algorithm feed (What news feed is provided, how?)
	Social context (Information related to action/behavior trace of other news consumers, e. g., comments, affective tagging such as emoji, liking, sharing, viewing such as information that gets fed into the algorithm)
	Reading (paying great attention to understand the piece and the context it situates)
	Watching (full attention, cinematic experience, discussion afterward)
	Snacking (consume bits and pieces of information to gain a sense of what is going on)
	Scanning (get the highlights, the gist, efficiency)
	Metadata (Accessing and readings/viewing additional information around the media – i. e., comments, emojis, likes)
Media Use	Internal, cognitive use/action (Initiation of new media consumption loop e. g., I want to look at different post leading to new goal and context of consumption)
	External, behavioral use/action (Clicking, linking, sharing, liking, creation of recommendation, commenting, voting leading users back to communicator variables)