Measuring the Digital and Media Literacy Competencies of Children and Teens

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ABSTRACT

Because media literacy has been described as a "constellation of competencies," diverse approaches have been used to measure media literacy. Media literacy education includes the paradigms of empowerment and protection, which are used to conceptualize the potential benefits and risks of growing up in a media-saturated society. Performance or competency-based measures examine the ability to critically analyze and/or create media, where learners engage in the practice of evaluating the message content, format, and techniques used to attract and hold attention. Self-report measures ask learners to rate or agree with various statements that reflect attitudes, knowledge or behaviors. Each approach to measuring media literacy competencies embodies core values in relation to a particular set of goals, contexts and situations. Research is emerging that examines the intersection of cognitive and affective domains and the role of teacher motivations in shaping learning outcomes, opening new opportunities to advance the field.

Keywords: media literacy, digital literacy, children, learning, teaching, professional development,

It might not be too much of a stretch to argue that media literacy entered the mainstream of public education when educational testing companies began including media literacy themes in their testing regimes. For example, in 2011 the College Board's essay test included a prompt about reality TV in which the question read:

> "Reality television programs, which feature real people engaged in real activities rather than professional actors performing scripted scenes, are increasingly popular. These shows depict ordinary people competing in everything from singing and dancing to losing weight, or just living their everyday lives. Most people believe that the reality these shows portray is authentic, but they are being misled. How authentic can these shows be when producers design challenges for the participants and then editors alter filmed scenes? Do people benefit from forms of entertainment that show so-called reality, or are such forms of entertainment harmful?"

The *Washington Post* and some other media outlets critiqued the College Board's choice of question, wondering whether an intimate knowledge of reality shows would give an essay-writer an advantage in presenting examples and vivid details about TV shows like *Jersey Shore* and reality TV celebrities like Snooki. Because the essay test invites students to take one side of an issue and develop an argument, such questions are valuable to learners. The College Board claims that students are quite interested in the underlying issues covered in the prompt, which include the effects of television on society, the desire for fame and celebrity on the part of ordinary people; the authenticity and value of various realistic representations. Indeed, issues of representation are central to the study of all the arts, including media, painting, film, drama and literature (Bunin, 2011).

The framing of the College Board essay question is structured such that it embodies the mainstreaming of the empowerment-protection dialectic of media literacy. For most of the 20th century, media literacy has been alternately framed in one of two ways: empowerment is a form of taste discrimination that enables people to make good decisions about evaluating the quality of media content, while protection is rooted in the idea that critical thinking about media reduces people's likelihood of negative influence to media content, including violence, sexuality, propaganda and misrepresentation. By embracing a dialectic of empowerment and protection, media literacy advocates conceptualize the audience as simultaneously active as constructors of messages and meanings and as potentially vulnerable to negative media effects (Hobbs, 2011). As we will see in the pages that follow, both empowerment and protectionist paradigms have shaped the way people aim to measure digital and media literacy competencies. After reviewing the context and background of children's media uses and behaviors, I outline two approaches to measurement used by researchers and consider the need for some new strategies that connect cognitive and affective domains while being sensitive to the role of the teacher in shaping the learning context.

Context and Background of Children's Media and Technology Use

Contemporary framing of children's use of media and technology has been undergoing a transformation that has resulted from the rise of the Internet and the availability of ubiquitous wireless broadband (Aspen Institute Task Force on Learning and the Internet, 2014). For many years, children's immersion in digital media texts and technologies, and the larger media culture in which they circulate has long interested

professionals in human development, communication and media studies, and education (Anderson & Hanson, 2010; Bawden, 2007; Bazalgette, 1991). Although social norms of media use at home and school are quite varied, most American children have a television in their bedroom and by age 10 have access to a tablet, computer and/or cell phone for their personal use (Pew Research Center, 2015). In a 2015 study with a nationally representative sample of children and youth ages 8–17, researchers found that tweens and teens spent about 40% of their time in passive media consumption, including watching online videos, TV, reading, and listening to music. Interactive consumption, including playing games and browsing websites, represented about 37% of a tween's time with media and 25% of a teen's daily media use. Communication activities, including using social media and video chatting, represented 26% of teen's daily media use. By contract, creative media production activities including making art or music or writing represented only 3% of time spent with media (Common Sense Media, 2015).

Parents, classroom educators and researchers may differ in their perceptions of the risks and rewards of integrating digital media into the context of public education (Howard, 2010; Livingstone, 2012). Although quality of access is uneven, schools are increasingly likely to provide learners with wireless Internet access throughout the K-12 spectrum. More and more schools use tablets, laptops and other digital media as a part of instruction, where children are encouraged to use information sources and interact with digital texts and technologies (Bakia, Murphy, Anderson, & Trinidad, 2011). Since the birth of social media in 2007, there has been the widespread understanding among parents, educators and future employers that *digital literacy* competencies are required to use the Internet and social media (Belshaw, 2012).

Among educators, there is a growing awareness that the concept of literacy is expanding to include mass media, popular culture and digital media (Felini, 2014). The term *media literacy* intentionally transforms and expands the concept of literacy from its narrower definition focused on reading and writing of alphabetic text to a broader one focused on the sharing of meaning through symbolic forms. By expanding the concepts of text and authorship to include media, media literacy is becoming a mainstream part of English education (Behrman, 2006; Bruce, 2012; Hobbs, 2007). People who are media literate can "access, analyze, evaluate, and communicate messages using a wide variety of forms" (Aufderheide & Firestone, 1993; 1). Media literacy education is aligned with inquiry learning and emphasizes the practice of "asking critical questions about what we watch, see, and read" (Hobbs, 2010, iii). By analyzing and deconstructing messages through asking "how" and "why" questions, learners come to recognize the constructed nature of symbol systems. Media literacy education focuses on critical analysis and inquiry through a pedagogy of asking questions about media form and content, including issues of authorship, ownership, distribution and impact while the term *digital and media literacy* includes the skills, knowledge and competencies associated with the Internet and social media (Hobbs, 2010). Advocates want learners to "acquire a basic understanding of the ways media representations structure our perceptions of the world; the economic and cultural contexts in which mass media is produced and circulated; the motives and goals that shape the media they consume; and alternative practices that operate outside the commercial mainstream" (Jenkins et al. 2006, 20).

Approaches to the Measurement of Digital and Media Literacy Competencies

Digital and media literacy have been called "a constellation of life skills" (Hobbs, 2010, vii) due to the diverse definitions, uses, purposes and contexts in which digital and media literacy is applied. As a result, there is obviously no agreed-upon standard approach to the measurement of these competencies. Academic researchers have been especially challenged to create research that meets the needs of educators. Competency-based or performance measures of media literacy are appealing to educators and pragmatic researchers: the use of naturalistic measurement of tasks resembling school assignments may help link academic research on media literacy with assessment of student learning, increasing the perceived relevance of academic scholarship among K-12 educators. Researcher-initiated interventions that rely on large-scale surveys and self-report measures are useful for testing some of the explicit and implicit benefits of media literacy education and for the development of theory. One scholar wrote: "It has become widely accepted that evaluating and explaining effectiveness is one of the most profound challenges for contemporary research on media literacy education" Martens, 2010, 9).

Theoretically, the measurement of media literacy competencies has been influenced by the development of perspectives from both the humanities and the social sciences. Humanistic approaches to media literacy tend to emphasize ideas from semiotics, meaning, interpretation and political economy while social scientific approaches to media literacy emphasize media effects. The core concepts of media literacy are a set of humanistic principles developed at the Aspen Institute Leadership Conference on Media Literacy in the early 1990s. The concepts includes these ideas: (1) All media messages are constructed; (2) media messages are constructed used a creative language with its own rules; (3) different people interpret the same media message differently; (4) media have embedded values and points of view; and (5) most media are organized to gain profit and/or power. These ideas serve as foundational understandings that media literate individuals use as both consumers and producers of media messages (Center for Media Literacy, 2002). In synthesizing the core ideas of media literacy, information literacy, visual literacy and new literacies, Hobbs (2006) frames key humanistic ideas around the theoretical of authors and audiences (AA), messages and meanings (MM), and representations and reality (RR). Reflecting the British media education tradition, Buckingham (2007) identifies four concepts (language, production, audience, and representation) to identify core theoretical ideas that serve to focus critical inquiry.

Social scientific perspectives to media literacy education generally emphasize the negative effects of media and attempt to use media literacy education to mitigate those effects. Some examples include a focus on media violence, sexual representation, and body image (Potter, 2010). In the social science conceptualization of media literacy, since the mass media have the potential to exert a wide range of potentially negative (and positive) effects, the purpose of media literacy is "to help people to protect themselves from the potentially negative effects" (Potter, 2010, 681). Scholars working in this tradition tend to target a specific "problem" where a particular vulnerability to media messages is identified and an intervention is designed. This work often relies on survey research to measure digital and media literacy competencies, testing hypotheses about the relationship between variables that assess the impact of advertising, news media, media

violence, racism, sexism and issues of representation, and perceptions of credibility of news and information.

Children's vulnerability to advertising and persuasion has long been a concern of media literacy educators (Rozendaal, Lapierre, van Reijmersdal & Buijzen, 2011). As a result of deregulation of media industries in Great Britain, media literacy has become the official remit of the British media regulator, OFCOM (Wallis & Buckingham, 2013). There, government researchers have examined how British children see a variety of new forms of advertising. For example, research has shown that many children and young people are relatively unfamiliar with how to recognize online advertising. In one performance-based measure of media literacy, children were shown a picture of the results returned by Google for an online search for "trainers," the British term for athletic shoes, and then asked to identify advertising displayed in online search results. Even though the sponsored links were presented in an orange box with the word 'Ad' written in it, fewer than one in five children and only one-third of teens were able to correctly identify these sponsored links as a form of advertising. Half of British teens were aware of personalized advertising, by recognizing that some people might see ads that differ from those they see when visiting the same website or app. However, fewer than half of the teens were aware of the potential for vloggers (creators of video blogs) to be paid for endorsing products or brands (OFCOM, 2016). This evidence suggests that media literacy competencies are still not fully developed among British children and teens, where media education has a long and distinguished tradition in the context of English education.

In recent years, performance-based measures have been outstripped by qualitative research studies which dominate the education literature. In many studies of digital media and learning, researchers develop a short-term, (often) grant-funded intervention and report on informal learning practices that involve children and youth who participate in digital media literacy programs or online communities (Barron, Gomez, Pinkard & Martin, 2014). Numerous case studies of practice also fill practitioner journals, like the *Journal of Adolescent and Adult Literacy*, demonstrating the varied contexts in which teachers, as well as those working in afterschool settings, have developed programs and activities that blend critical thinking and creative media production using digital media and technologies. Case studies of individual learners/classroom help scholars and educators visualize the learning process inside the classroom and advance theory about digital and media literacy education pedagogy but may not offer much insight on how to evaluate, scale or assess the quality of school-wide or district level initiatives.

In the pages below, I identify the distinctive characteristics of performance or competency-based measures of media literacy as well as measures that rely on self-report of attitudes and knowledge. Performance-based measures represent the "gold standard" because they precisely capture dimensions of media literacy competencies using tasks that are highly similar to the everyday practices of analyzing and creating media in the real world. Self-report measures can help researchers test theories, by asking users to self-assess their knowledge, skills, attitudes and behaviors, and by considering the relationship between media literacy competencies and other variables. Each of these approaches has differential value to practitioners and scholars. In the sections below, I examine some characteristics of competency-based and self-report measures to assess media literacy education.

Competency-Based Measures

Competency-based measures of digital and media literacy have generally focused on the cognitive domain, engaging learners in using, analyzing and creating media texts. Users are asked to demonstrate their analysis and creative skills, often through the use of questions that invite students to analyze media or create media. Measuring media literacy through performance tasks is a practice that is well-aligned with classroom routines, as elementary and secondary teachers routinely create assignments where demonstration of critical analysis is required. Among the first to develop such methods are Quin and McMahon (1995) who studied two tests that were developed by a panel of Australian teachers to measure students' media literacy learning. High school students were asked to analyze the language, narrative and target audience of print advertisements and an excerpt from a situation comedy. Students were able to demonstrate their learning of how to analyze media texts using this performance-based measure of media literacy. After receiving media instruction as a part of their standard curriculum, students could perform lower order thinking tasks such as identifying compositional elements and analyzing the impact of those elements on the mood of a piece. Students were less skilled in analyzing the more complex relationships among issues of authorship, purpose, cultural context, and audience. Authors acknowledge that it is possible that this measurement tool may have been biased in favor of girls and native English speakers, who scored higher relative to the other sub groups.

In studying teens in American high schools, Hobbs and Frost (2003) used a quasi-experimental design to compare a group of Grade 11 students who were involved in a year-long media literacy curriculum to students in a matched control school who had a traditional literature-based English curriculum. Researchers examined students' ability to critically analyze print advertising, radio and television news, asking students to identify the purpose, target audience, point of view, and construction techniques used in media messages. Students were also asked to identify omitted information as a means to measure their ability to recognize a message's distinctive point of view. The study compared pre- and post-test responses of students in the two schools. Results showed that students enrolled in the media literacy program had higher levels of comprehension and analysis of media messages, including print, video and audio messages as compared to the control group. This study also measured students' compositional skills, and the assessment also showed that those in the media literacy group produced longer paragraphs in their writing, perhaps because they had a better understanding of how to critically analyze a news media message as compared to students who did not receive instruction in media literacy.

Performance-based measures of media literacy generally require hand scoring and decisions about scoring test responses may involve examining the variation in student responses to an expert group (for example a panel of high school teachers) or by examining individual responses in relation to the range of responses within a particular peer group of users who also completed the test. For example, in the Hobbs and Frost (2003) study, after watching a TV news segment about hurricanes, students were asked, "What values or points of view were presented in this message?" A student who responded, "Much of this story was presented from the point of view of the people who were affected by the storm" was considered to have a higher-level answer than a student who wrote, "Hurricanes are destructive, dangerous, and unpredictable." Hand scoring

generally involves the construction of a code book, training of two or more coders, and careful attention to language, inferential meaning and interpretation in judging responses.

Other researchers have used performance-based measures of media literacy to demonstrate its correlation with traditional measures of critical thinking. Arke & Primack (2009) found that, with a small sample of college students, there is good internal consistency among the five subscales of the measure: recall, purpose, viewpoint, technique, and evaluation. In their measures, closely adapted from the work of Hobbs and Frost, "recall" assesses basic comprehension of author intention, "viewpoint" domain assesses both whether the participant can identify the sender of the message, and what points-of-view may be left out of the message. The "technique" domain assesses an individual's ability to analyze the production techniques that were used to attract attention. Finally, the "evaluation" domain assesses how an individual evaluates that message in comparison to his/her own perspective. These measures of media literacy were found to be strongly correlated with the California Critical Thinking Skills Test (CCTST), which assess critical thinking and reasoning skills.

As mentioned in the opening paragraphs of this paper, the for-profit testing industry has also explored the value of measuring digital and media literacy competencies. The pressure for accountability in higher education has inspired the development of various instruments designed to measure learners' ability to navigate, understand and critically evaluate information available through digital technology (ETS, 2003). The iSkills test is a performance-based measure that utilizes real-world scenarios to measure the ability to navigate, critically evaluate and make sense of the wealth of information available through digital technology. These scenarios are set in the context of the humanities, social sciences, natural sciences, business/workplace, practical affairs and popular culture, and assess the seven critical information, communication and technology (ICT) content areas, featuring seven task types aligned with the ACRL standards: define, assess, evaluate, manage, integrate, create and communicate (Educational Testing Service, 2004).

For example, one task asks users to review information sent by seven people about training courses taken by people in an organization and create a memo to summarize information and data. To perform the task, users must read the material, identify the relevant data and information about training course attendance, and summarize key themes, using both word processing and spreadsheet software tools. In another scenario, users are asked to evaluate medical information about arthroscopic surgery to repair a tennis injury. This task requires test takers to use a search engine to locate sites that have articles about connective-tissue injuries, anterior cruciate ligament tears, arthroscopic surgery, and rehabilitation programs. Users must effectively and efficiently locate information, evaluate its sufficiency for the purpose, and to evaluate the degree to which the source is trustworthy (Somerville, Smith, and Macklin. 2008).

After completing a series of simulation tasks like this, students receive a score based on their ability to evaluate the usefulness and sufficiency of information for a specific purpose; create, generate or adapt information to express and support a point; communicate information to a particular audience or in a different medium; define an information problem or formulate a research statement; and access, summarize and integrate information from a variety of digital sources (Educational Testing Service, 2014).

The measurement of media literacy can reveal important gaps between self-assessment (measured by self-report) and actual performance (measured by competency tasks). When implementing the iSkills test with undergraduate students, researchers found a significant gap between the skills students believe they possess and their actual competencies. For example, before taking the iSkills test, a sample of 262 Purdue University freshmen were asked to self-assess their information and communication skills; 90% rated themselves highly skilled users of information technologies. Yet 52% of these students performed scored lower on the iSkills test than 50% of the population who took the test. That means that more than half of this group of students who believed they were competent at information and communication skills could not demonstrate the skills when asked to perform them (Somerville, Smith, and Macklin, 2008). For this reason, performance or competency-based tasks provide the highest standard of precision in measuring media literacy competencies.

The iSkills test was a promising approach to the measurement of digital and media literacy. But it's important to note that in 2016, ETS made a decision to discontinue the iSkills test because it simply did not sell well in the education market. The company had designed the test for students in the last two years of high school and the first two years of college. Given the rapidly changing nature of information technology, it's likely that, over time, the interface for completing the performance tasks was perceived by users as clunky and unattractive. ETS claimed that "usage of the assessment has declined to the point that we can no longer support the test from a psychometric standpoint. In addition, the assessment requires updates to ensure it remains compatible with changing technology" (ETS, 2014). As technology changes, the practice and nature of digital and media literacy competencies also change. Without a large enough sample of users, the test simply has lost its economic viability. Indeed, performance-based measures of digital and media literacy are expensive to develop, score and maintain over time. For this reason, many researchers rely on self-report measures to provide an inexpensive approximation of the competencies that embody some aspects of media literacy.

Self-Report Measures of Media Literacy

The use of self-report to measure media literacy has a long history as researchers recognized the value of finding ways to identify how people make critical judgments about media (Brown, 1991). In the 1980s, researchers used *perceived realism* as a proxy for media literacy, examining how learners evaluate the realism of television programs, asking them to explain why they perceived particular programs as realistic and others as unrealistic. In general, audiences are thought to perceive media content as realistic if they judge it to be like real life in some meaningful way or if they respond to it as though it were real (Hall, 2015). Perceptions of realism differ among individuals as people use different criteria to make realism judgments, including factual realism, social realism and narrative coherence. Such judgments may occur at different stages of the interpretation process: some people begin interpreting a specific media text based on the format or genre, while others evaluate as they read or view, and still others evaluate realism retrospectively (Bussell & Greenberg, 2000).

Many scholars have examined how media literacy may support healthy lifestyles among children and teens (Domine, 2015). In evaluating the impact of media literacy

program, Austin and her colleagues incorporated perceived realism into the development of the Message Interpretation Process (MIP) model (Austin & Knaus, 2000) to trace factors that may lead to increased cognitive involvement with media messages through both reasoning and affective pathways of decision making. The model builds on social cognitive theory and expectancy theory and extends dual-process theories of persuasion. Levels commonly analyzed using the MIP framework include desirability; perceived realism, norms, and perceived similarity; identification; expectancies; and behavior.

In one study that using this model, Pinkleton et al. (2008) explored how a teen-led media literacy curriculum focusing on sexual portrayals in the media might increase adolescents' awareness of media myths concerning sex, decrease the allure of sexualized portrayals, and decrease positive expectancies for sexual activity. A posttest-only quasi-experiment with control groups was conducted with 522 middle-school students at 22 school and community sites in Washington. Significant differences were found in the knowledge gained by those in the media literacy program as compared to control-group participants. Students in the media literacy group were less likely to overestimate sexual activity among teens, more likely to think they could delay sexual activity, less likely to expect social benefits from sexual activity, more aware of myths about sex, and less likely to consider sexual media imagery desirable. Thus, as part of a sex education program, media literacy instruction may provide adolescents with a cognitive framework necessary to understand and resist the influence of media on their decision-making concerning sex.

In addition to asking people to self-assess their competencies, media use behaviors as well as knowledge of media industries, institutions or economics have also been considered to be important variables in the development of media literacy competencies (Potter, 2010). Some of this research has come about as the result of government mandate. For example, in Britain, the media regulator OFCOM has taken responsibility for measuring the media literacy competencies of British children and adults. Although the government agency generally focuses on gathering data about people's media use (the frequency of media activities involving laptops, cell phones, radio and television), they also include a mix of self-report behaviors and knowledge measures as a dimension of media literacy competencies.

In 2015, a random survey of 500 children aged 8-15 who used the Internet at home or elsewhere were surveyed about their critical understanding, a concept used in England to describe the skills and knowledge children needed to understand, question and manage their media environment. OFCOM did not find evidence that these skills and knowledge were increasing among British children. In 2015, when asked to judge the truthfulness of content, British children were more likely than in 2014 to think that various kinds of online information were "always true." Surprisingly, 23% of children aged 8 to 11 and 14% of children aged 12 to 15 answered that all the information on news and information sites is true. One in five teenage users of search engines believed that if a search engine lists information it must be true. Only one-third of 12 to 15-year-old viewers of television gave the correct response when asked how the BBC is funded (OFCOM, 2016).

Self-report measures of media literacy have also been used by public health and communication researchers to examine how media literacy education may help modify attitudes and knowledge that contribute to behavior change (Austin & Johnson, 1997;

Domine, 2015). As an example, Primack and colleagues developed and validated the Smoking Media Literacy (SML) scale, a self-report Likert scale with items representing the three theoretical frames of authors and audiences, messages and meanings, and representations and reality. Items include: "To make money, tobacco companies would do anything they could get away with," "Cigarette ads try to link smoking to things that people want like love, beauty and adventure" and "Cigarette ads show scenes with a healthy feel to make people forget about the health risks." These measures have been found reliable with both high school and middle-school students and have been used in evaluating web-based programs for media literacy (Shensa, Phelps-Tschang, Miller, and Primack, 2016).

Other self-report measures of media literacy ask users to reflect on their critical thinking about both media sources and message content. Austin, Muldrow, and Austin (2016) evaluated critical thinking about the source of the media message on a 7-point Likert scale, where users respond to statements like "I think about the purpose behind alcohol advertisements I see," "I think about what the creator of alcohol advertisements wants me to believe," "I think about who created the alcohol advertisements I see," and "I think about the truthfulness of alcohol advertisements before I accept them as believable." They respond to items that invite them to reflect on their evaluation of the content of the message, responding to statements like "I think about what the creator of a message wants me to think," "I look for more information before I believe something I see in messages," and "It is important to think twice about what messages say." They found that critical analysis of sources is a precursor to critical thinking about media content and that both skills are associated with personality factors, including the need for cognition and the need for affect.

Many studies have used scaled self-report measures of the media literacy competencies of learners to examine what Scharrer (2002) has called the implicit assumptions about the benefits of media literacy education. In an important meta-analysis of 51 quantitative studies of media literacy interventions involving learners ranging from elementary school to college students, Jeong, Cho, and Huang (2012) found a moderate overall effect size (d = .37), indicating a positive role of media literacy in shaping these outcomes. Interventions that were longer resulted in larger effect sizes and those interventions with more instructional components (including, for example both analysis and creative media production activities) resulted in smaller effect sizes. A closer review of this study suggests that differences between academic research and program evaluation may partly explain these findings. In well-controlled researcher-centric programs, simple experimental manipulations target short-term attitude, knowledge or behavior change, and researchers have more success measuring a limited number of learning outcomes with precision (Grafe & Breitner, 2014). For those who design, implement and assess more complex and real-world oriented media literacy programs in the field, which often include multiple goals and outcomes as per the needs of diverse stakeholders including educators, parents and researchers, measurement challenges may result from differential program completion rates and other challenges associated with field-based research.

Media Knowledge and Media Literacy

How important is knowledge of media industries, media theories and media effects in the development of media literacy competencies? Potter's (2004) theory of

media literacy posits that knowledge about media content, industries and effects is key to identifying people's level of media literacy. In particular, he claims that people with more knowledge of how media institutions operate will be more media literate than those with less knowledge. Potter also distinguishes between low-level information like knowing the lyrics to television show theme songs and knowledge gained from personal experience, noting that "people who have played sports will be able to appreciate the athletic accomplishments they see on television to a greater depth than those who have not physically tested themselves on those challenges" (p. 34).

In exploring the relationship between knowledge of the news media and usage or consumption of news, Ashley, Maksl and Craft (2013) developed an index to assess media knowledge as a dimension of news media literacy. They used multiple-choice questions to test college students' knowledge of the structure of the U.S. media system, focused on knowledge of business, ownership and regulatory systems, media effects, and content frames. Items included knowing that: CNN.com employs reporters whereas Google News does not; journalists are not required to be individually licensed in the United States; FOX News is generally thought to have a politically conservative bias; and only about five companies own the majority of major media outlets today compared to 50 companies in the early 1980s. Other knowledge items included knowing that people who watch a lot of television news tend to think the world is more violent and dangerous than it really is.

Some researchers doubt the value of media knowledge as a dimension of media literacy. In framing media literacy as a set of critical competencies, Hobbs and Moore claim that intellectual curiosity and the ability to ask "how" and "why" questions is far more important than either having digital technology usage skills or possessing knowledge about the media industry. They argue that when instructors are over-focused on transmitting knowledge in a media literacy program, the instructional strategies used may not advance critical thinking competencies. Still, they acknowledge that contextual information about media industries, economics, and effects may shape people's interpretation and inquiry processes (Hobbs & Moore, 2013).

Scholars who have measured the impact of media literacy curricula on young people's civic engagement have found that exposure to a media literacy presentation can mitigate perceptions of bias (Vraga, Tully & Rojas, 2009) and that learning about the structure of the U.S. media system can increase skepticism as measured by credibility ratings of news stories (Ashley, Poepsel & Willis, 2010). McDevitt and Kiousis (2006) observed how effects of a grade 5-12 civics curriculum curriculum passed from students to their families. Using a primary-group model, the family was conceptualized "as mitigating the influence of social structural institutions such as schools and mass media" (p. 261). They found that the civics curriculum stimulated increased political knowledge and information seeking from news media in students, who in turn, stimulated increased political knowledge and information seeking from news media among their parents. The impact was greater for low-income families, thus narrowing the knowledge gap related to political issues.

Because democracy depends on people caring about the accuracy of information used to make political decisions, researchers have examined the relationship between political knowledge, critical analysis of media, and exposure to media literacy education. Because people's judgment of truth is shaped more by their pre-existing beliefs rather

than the evidence itself, researchers have long examined how confirmation bias may intersect with reasoning processes (Johnson, Hashtruosi & Lindsay, 1993). Recently, Kahne and Bowyer (2016) conducted a field experiment to determine how directional motivation and accuracy motivation affect young people's judgments of truth claims. They embedded an experiment inside a survey of a large, nationally representative sample of 2,101 young people aged 15 – 27. Some participants were randomly assigned to view one of 6 posts (political cartoon or graph) on the topics of income inequality and tax policy. These posts were manipulated in two ways: (1) type of evidence: some verbal content was emotive (subjective with no evidence presented), some was evidence-based, and some included misinformation; and (2) political ideology: liberal (referencing "the rich") and conservative (referencing "successful Americans"). Participants were asked to rate the accuracy of the post on a four-point scale and as part of the survey, they were also identified as liberal or conservative by asking their opinions on whether government should be involved in reducing income inequality. Also, a three-question survey judged to be a reliable indicator of political knowledge was used.

To measure exposure to media literacy education, participants were asked two questions: how often they had discussed in school how to tell if the information found online is trustworthy and how often they discussed the importance of evaluating the evidence that backs up people's opinions. Researchers used t-tests and regression to compare the differences in subjects' performance, finding that participants' judgment of accuracy was associated with their pre-existing political beliefs. Researchers found that 67% of participants who saw a post that aligned with their preexisting views rated it as accurate as compared with only 39% of people who saw a post that did not align with their political views, demonstrating that directional motivation affects judgments of accuracy. A regression analysis revealed that political knowledge does not improve judgment: those with more political knowledge were, in fact, were more likely to judge posts that they agree with as accurate despite the presence of misinformation. However, subjects who reported high levels of media literacy education show no differences in directional motivation and seem to make a clear distinction between a post with misinformation and one with accurate evidence, even when it agrees with their pre-existing political beliefs (Kahne & Bowyer, 2016).

Similarly, there is some evidence that media literacy education may disrupt other forms of bias. Babad, Peer and Hobbs (2012) examined teens' non-verbal processing of political news. Previous research has shown how people judge a TV interviewee more favorably when the interviewer's nonverbal behavior toward the interviewee is friendly rather than hostile. High school students who participated in a media literacy course were compared to a control group within the same school to determine susceptibility to media bias. Participants were shown a brief interview in which the interviewer's nonverbal behavior was friendly or hostile toward the interviewed politician. Results showed that the control group showed a nonverbal media bias effect and judged the interviewee more favorably when the interviewer was friendlier, whereas this effect disappeared among media literacy students.

Theoretical arguments position media literacy analysis competencies as situated within the development of more general reasoning and cognitive development. For younger children, the ability to use reasoning to justify one's media preferences has been identified as a precursor skill supporting future development of critical analysis skills.

This trajectory was supported in work by Hobbs and RobbGrieco (2012) who examined differences in 156 African-American children, ages 9 to 11, comparing a group of high-achieving students and one enrolled in a regular education program. Active reasoning was defined as the process of engaging in inference-making, reasoning or metacognitive thinking about media texts, tools, and technologies. High-achieving children were more likely than regular education students to engage in active reasoning when asked to offer an explanation for why a particular TV show, video game or music was one's favorite by identifying the genre, describing a compositional elements, making a link between elements, identifying the purpose or meaning of a message, or identifying the social purpose of a media message. Clearly, children's emotional response to media may provide opportunities to help them reflect on the characteristic features of the media they enjoy (Nichols, 2006; Nyboe & Drotner, 2008). However, researchers are just beginning to explore how media literacy competencies may develop in relation to the affective domain.

Media Literacy and the Affective Domain

In his comprehensive review of the literature, Martens notes that affective mechanisms are likely to interact with cognitive and behavioral dimensions of media literacy, "raising many additional methodological challenges" (2010, p. 15). Fortunately, academic researchers have begun to examine affective dimensions of media literacy competencies (Ranieri, 2016). Scharrer and Rarring (2012) examined children's journal entries in response to a media literacy intervention exploring media violence. In a program where undergraduate students provided media literacy education to elementary school students, researchers found that a protectionist orientation to media literacy which focused on negative media effects could be introduced in ways that "encourage complexity and nuance" (4). Analysis of children's written homework revealed that media literacy activities helped them reflect on moral and ethical values regarding the depiction of media violence. In another study, Friesem (2015) examined how affect was incorporated within video production lessons designed to engage elementary school-age learners and promote their collaboration in the context of a year-long technology integration initiative. Findings showed that, when students were involved in media making, teachers became more sensitive to the individual needs of learners, noting the unique contributions of children who may not have strong academic backgrounds but who thrive when presented with media production learning opportunities.

Affective dimensions of media literacy have also been measured in relation to teacher motivations for the use of media and technology in school. In reflecting on the results of a three-year university-school partnership in media literacy implemented in an urban elementary school, Hobbs and Moore (2013) described the kind of "messy engagement" that occured when children were empowered to create and analyze popular culture and digital media in ways that connected the classroom to the local neighborhood and community. They posited that teacher motivations for digital and media literacy might differentially shape instructional practices, as some teachers brought more student-centered, affective orientations into their approach to media literacy. Building on this research, a 48-item measure of teacher motivations for digital and media literacy was tested and validated among a large sample of 2,800 teachers in Turkey (Hobbs & Tuzel, 2015). This measure showed substantive differences in motivation between language arts,

social studies and technology teachers. For example, teachers who self-identified as *activists* (those who see media literacy as helping contribute making society more just and equitable) showed a different attitudinal profile than those who identified as *demystifiers* (those who emphasize asking critical questions about media) or *spirit guides* (those who value talk about media as a means to enhance children's socioemotional development). Future research is needed to examine how differences in teacher motivations regarding digital and media literacy may shape instructional choices in the classroom, and how these instructional choices then may affect students' media literacy learning outcomes.

Implications for the Future

As American children of ages 8 to 12 spend six hours with entertainment media each day, they engage in widely varying patterns of media use including those who can be classified as light media users, readers, mobile gamers, heavy viewers, video gamers and social networkers (Common Sense Media, 2015). Children's immersion in digital and media culture continues to rise and discourses of empowerment and protection will continue to attract attention from parents, teachers and others with interests in the developmental needs of children and teens (Tyner, 1998). The measurement of media literacy competencies by both educators, academic and professional stakeholders are conceptualizing the new competencies, skills and habits of mind that are necessary for full participation in a media-saturated and technologically intensive world.

The measurement of media literacy competencies is a fast-moving target. The use of both self-report and performance-based measures, indeed, from an increasing variety of disciplinary perspectives, including human development, public health, media studies, cultural studies, information science and media psychology reflects growing hyperspecialization of the field of children, media and education. The changes occurring in the media sector, with new apps, games, platforms and genres rapidly emerging, have contributed to the instability of meaning of the concept of media literacy and added to the measurement challenges (Wallis & Buckingham, 2013). Which specific competencies are worth measuring and how are these practices contextualized in relation to at-home and in-school uses of media and technology? We still need to learn more about how measurement challenges are also exacerbated when considering media literacy competencies in relation to the developmental trajectories of children and youth.

Protectionist paradigms offer important insight on the ways in which media and technology reflect and shape cultural values, including attitudes about aggression, sexuality, race and gender, and commodity culture. Media literacy education offers the potential to reveal how media reproduce inequalities. Critical inquiry practices help learners gain distance from their everyday and often unquestioned media use, seeing their own behavior in a new way. Such forms of learning may have the potential to contribute to renewing active citizenship for participation in democratic societies (Mihailidis, 2014). By strengthening the competencies of reflection and social action, protectionist paradigms enable people of all ages to build importance metacognitive and social communication skills.

Empowerment perspectives, including the paradigms of digital media and learning, visual literacy, information literacy and new literacies, all focus on competencies that enable people to access, analyze and create media, using an iterative

learning process where learning-how-to-learn predominates. Because media literacy educators bring a deep appreciation of the dynamic relationship between reading and writing, speaking and listening, and media analysis and media production, and this longstanding feature of the discourse community should contribute more to the development of innovative practices of measuring media literacy competencies (Morrelli et al, 2013; RobbGrieco, 2012; Rogow, 2013).

In this brief review of approaches to measuring digital and media literacy competencies, it is clear that researchers and practitioners differ in how they prioritize learning outcomes. Because of the challenge of designing valid and reliable measures, I have shown that both performance or competency-based measures of media literacy and self-report measurement tools can be useful. The research community must continue to explore the relative value of other variables, including media knowledge, habits of mind like intellectual curiosity, and the role of teacher motivations. As yet, researchers are just beginning to explore how media literacy may support development in the affective domain, particularly the development of empathy and socioemotional development. Future research is needed conceptualize and measure the intersectionality of these important concepts.

Because they are responsible for integrating digital and media literacy competencies into existing curriculum, elementary and secondary educators have an orientation to the identification of learning outcomes that is different from approaches used by academic researchers. For another Kuhnian paradigm shift to occur in this field, close examination of how teachers themselves aim to capture the full range of digital and media literacy competencies may be useful. It is possible that teacher creativity and reflexive practice has much insight to offer to academic researchers who advance new knowledge in the field.

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