



LITERATE THOUGHT: A COMMENTARY

Editorial

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ABSTRACT

A number of d/Deaf and hard of hearing students, as well as other students in special education programs, have difficulty accessing academic content information that, traditionally, has been presented in written language in print and electronically (e.g., textbooks, other school materials, etc.). Because this information represents what students need to know, there will be a large gap in their knowledge base, and students will not have ample opportunities to develop a high level of literate thought. That is, students will not be able to represent and manipulate information, solve problems, or develop other higher-level critical thinking skills. This article presents a case for the reconceptualization of literacy—namely, a broadening of our traditional notion of literacy as being able to read and write a written language. This reconceptualization, emphasizing literate thought, requires a discussion of types of literacies and an understanding of constructs such as access and interpretation, illiteracy, and listening comprehension. Also discussed is the intertwining of literate thought and Universal Design for Learning. The article concludes with questions for further exploration and dialogue.

Keywords: d/Deaf and hard of hearing, literacy, literate thought

For most educators and government officials, there seems to be little doubt that it is critical for citizens to possess adequate print literacy (reading and writing) skills, especially for academic and post-school success in societies that are predominantly dependent on technology and print (e.g., see discussions in Ellsworth et al., 1994). What it means to possess adequate proficiency is debatable, but it seems to be much more than just having functional print literacy skills (Paul & Wang, 2012). In fact it could be argued that possessing critical literacy skills is necessary for meaningful participation in the social, economic, and political institutions of society. These skills are or should be reflective of an informed citizenry.

This begs a line of questions: What is meant by critical literacy skills? Is this merely the ability to read and write at a proficient level? Are critical literacy skills only connected to the ability to read and write? Are reading and writing, however defined, the only avenues for the development of higher-level critical thinking skills?

The above list of questions is motivated by the persistent challenges faced by d/Deaf and hard of hearing students, indeed by a number of other special

education students as well, to develop critical print literacy skills that are commensurate with those of typical literacy learners. A number of American d/Deaf and hard of hearing (d/Dhh) learners, especially those with bilateral moderate-severe to profound hearing losses, have not achieved English print literacy outcomes commensurate with their typical literacy peers by the end of their formal education period or the completion of high school (Allen, 1986; Paul et al., 2013; Qi & Mitchell, 2012; Trezek & Mayer, 2019).

A few scholars have asserted that the reading/literacy levels have improved somewhat for d/Dhh learners, most notably for individuals who have benefitted from early intervention and the use of cochlear implants (e.g., Archbold, 2010, 2015; Easterbrooks & Beal-Alvarez, 2012; Mayer et al., 2016; Mayer & Trezek, 2018). Nevertheless, many of these students still experience a slow growth in reading/literacy achievement (less than a half grade level per academic year) and continue to have difficulty accessing the academic content information in academic texts, literature, and other school materials in print on paper or available electronically.

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Because academic content is delivered mostly via the written word, a number of children and adolescents will lag in their acquisition of relevant knowledge. Difficulties with the academic language associated with academic content impede their ability to solve problems or develop other higher-level critical thinking skills often associated with subjects such as, for example, science or history.

The main objective of this article is to argue that the construct *literate thought* should be seriously considered as the predominant educational goal for d/Dhh students, indeed for all students. Briefly, literate thought is the ability to think creatively, critically, logically, and rationally (Paul & Wang, 2012). This construct embodies the critical literacy skills, which should be paraphrased as critical literate thinking skills. However, this embodiment requires a reconceptualization of the traditional notion of literacy (discussed later), recognizing that there are various types of literacies as indicated by the field called the New and Multiple Literacies (e.g., Paul & Wang, 2012; Tyner, 1998).

Literate thought is also related to the major principles of Universal Design for Learning (UDL; Coyne et al., 2012; Hartmann, 2011; Rose & Gravel, 2010). In essence, d/Dhh students might need alternative or additional modes for accessing information to develop complex, critical literate thinking skills. Research on these alternative modes might be discouraged by current traditional beliefs and immense attention regarding the merits of print literacy skills for obtaining proficiency on state-wide achievement tests, especially in the United States (Butler & Stillman, 2002; Calfee, 1994). It is important to not permit the inaccessibility of print literacy skills for a number of students to interfere with the acquisition of knowledge and critical thinking skills.

With respect to the above discussion, the plan for the rest of the present article is as follows. First, the construct literate thought is elaborated and contextualized within a pair of concepts, listening comprehension and reading comprehension. With this background, it is argued that traditional literacy (reading and writing) should be reconceptualized. This leads to a rendition of types of literacies for d/Deaf and hard of hearing students with respect to another pair of concepts, access and interpretation. Subsequently, literate thought will be related to Universal Design for Learning (UDL), particularly the various modes of representations of information (Coyne et al., 2012; Hartmann, 2011; Rose & Gravel, 2010). The present article also provides perspectives on the terms, literate and illiterate. Finally, the concluding section provides a summary and proffers questions for further exploration and dialogue.

Literate Thinking Skills

Literate thought, or literate thinking skills, is not a stream of consciousness or a case of random thinking. It is an entity that is highly organized and goal-directed for solving problems, comprehending and applying information, or constructing learned outputs such as answering questions or composing articles, books, essays, or poetry (Paul & Wang, 2006, 2012).

In one sense, the literate thinking skills of literate thought embody metacognitive skills (e.g., see discussions in Calfee, 1994; Israel, 2007). However, it is argued that literate thought is broader than metacognition because it entails, in part, the use of creative, critical, and imaginative thinking aspects as well as the representations and manipulations of the outcomes or products in memory.

Literate thought has also been compared to the construct, comprehension (Paul & Wang, 2012). Comprehension is often described as a paradigm for cognition (Kintsch, 1998)—that is, cognitive skills or strategies are utilized for representing and understanding information. Nevertheless, literate thought embodies comprehension and metacognition and, in this sense, it can be stated that literate thought might be a more accurate paradigm for cognition.

As mentioned previously, literate thinking skills have been often associated with the traditional notion of literacy, that is, the ability to read and write at a proficient level (e.g., see Calfee, 1994; Olson, 1986, 1989, 1991, 1994). Throughout the present article, it is argued that literate thinking skills can and should be developed in the through-the-air (i.e., use of conversational or colloquial language) and “captured” modes (e.g., print, Braille, and even non-print modes via the use of audiobooks or sign books).

Consider the following passage from Olson (1994):

All thinking involves perception, expectancies, inference, generalization, description, and judgment. Literate thought is the conscious representation and deliberate manipulation of those activities. Assumptions are universally made; literate thought is the recognition of an assumption as an assumption.... Even if literate thought is to a large extent ordinary thought rendered self-conscious and deliberate it is not tied exclusively to the practice of reading and writing. Literate thought can be, indeed is to some degree, embedded in the oral discourse of a literate society. We can talk of conjectures just as well as read and write about them. Literate thought is not restricted to the medium of writing even if writing and reading were critical in their evolution. (pp. 280-281)

The above passage implies, at least, that proficiency in traditional literacy (reading/writing) is not necessary for the development of literate thinking skills or literate thought. Oral discourse, often called oral or through-the-air literacy, is or can lead to the development of literate thought, especially within a society that is embedded in the use of the written word. Of course, there may be differences in oral discourses between print societies and non-print societies—that is, societies with no written language (e.g., Ong, 1982; Rubin, 1995). These differences do alter the construction of literate thought—but that topic is beyond the scope of the present article.

Previously, it was mentioned that literate thought is or can be a paradigm for cognition. In essence, literate thought entails the cognitive representations of information and manipulations of the contents in organized and goal-directed activities. Such information can also include the contents of personal and social interactions and discussions. Thus, as implied by Olson (1994), literate thought can be developed in the through-the-air or captured mode (for further discussion, see Paul & Wang, 2012).

Another way to state this: Literate thought is mode-independent; it is not restricted to a particular delivery mode of presenting information. Ultimately, it could be asserted that no particular delivery mode of information should be privileged. This implies that the quality and quantity of information is roughly similar, in spite of nuances, in all delivery modes (e.g., through-the-air, print, Braille, audio books, sign books). Such an assertion requires additional research; however, there is sufficient research for the importance of literate thought in the through-the-air mode, which is associated with listening comprehension, discussed in the ensuing paragraphs.

Listening Comprehension/Reading Comprehension

To build on the above mode-independent assertion, this section focuses on listening comprehension and reading comprehension, particularly as this pair relates to the concepts, colloquial and academic language. It should be possible to address two questions: (1) Does it matter whether one can comprehend a passage via reading or via listening (or viewing/watching as in a sign language), and (2) Do the listening/reading comprehension constructs reveal insights into the requirements for the mode of captured information (e.g., print versus non-print)?

Comprehension is difficult to define, but there is agreement that there are various levels within a print text or across texts or across through-the-air dialogues and conversations (e.g., Kintsch, 1998; Paul & Wang, 2012). It might be that listening comprehension is not as complex as reading comprehension (for written language). It is tempting to associate listening comprehension with the use of colloquial language, often used in face-to-face or through-the-air social interactions. On the other hand, reading comprehension is often associated with academic or literate language. In general, when compared to colloquial language, academic language in school subjects contains more complex language structures and lexical diversity as well as dense topics and explanations (e.g., see Fang et al., 2006; Snow & Uccelli, 2009). Despite the differences between colloquial and academic language, it has been argued that students need to develop a level of competency in the colloquial (or through-the-air) form of a language in order to attain proficiency in the academic form of that language found in learned materials (e.g., see Mayer, 2009; Paul et al., 2013).

For our purposes here, it is also argued that listening (or viewing/watching) comprehension can be associated with either colloquial or literate/academic language. It depends on the genre or the content of the information—not necessarily the mode of delivery (Paul & Wang, 2012).

For example, consider situations where students are listening to an audio book, which is a translation of an academic text, or to a learned lecture in the classroom. It should be clear that both of these instances require adequate listening comprehension skills for academic or literate language, assuming that students already possess a level of skill in the colloquial use of the same language.

It also is important to describe what is meant by “listening.” Consider the passage by Sticht and James (1984):

D. P. Brown, a blind educator, completed his doctoral dissertation 30 years ago at Stanford University. In it, he analyzed relationships among oral and written language skills.... He argued that listening to and comprehending spoken language is different from listening to nonlanguage sounds, which is something the prelanguage infant can do. He argued that, just as reading is not called looking, though it certainly involves looking while processing language symbols, listening while processing language signals should not be called merely listening. Listening, so he argued, is a parallel term to looking, and it causes confusion to have the term also serve as the oral language counterpart to reading. So he coined the term auding to refer to the process of listening to language and processing it for comprehension. (p. 293)

So, “listening” is not really the counterpart for “looking” in reading, but rather is “parallel” and involves language comprehension (and other skills). This type of language comprehension is analogous to reading comprehension; indeed it is necessary for reading comprehension—at least according to the *Simple View of Reading* (SVR) theory (Hoover & Gough, 1990). This theory, supported by a robust line of research, asserts that reading comprehension equals decoding + listening/language comprehension. That is, both decoding and listening comprehension are necessary for reading comprehension.

In essence, it should be possible to facilitate the development of comprehension skills, such as making inferences, drawing conclusions, obtaining the main idea, and so on, via listening or auding in a particular genre (fiction, non-fiction). This can result in a transfer of the skill from through-the-air to print reading, once the learning-to-read stage has been completed. Thus, auding (listening) and print reading represent alternative paths to shared language competencies and cognitive content. And, auding and reading present reciprocal developmental interactions—each influences the other.

It should not be surprising that auding/listening comprehension is higher than reading comprehension until students can read to learn (occurs after the learning to read stage). During the reading-to-learn stage, students’ comprehension levels of auding/listening and reading are equal (e.g., Butler & Stillman, 2002; Kamhi & Catts, 2012; Paul & Wang, 2012; Sticht & James, 1984).

It should be added that reading comprehension cannot exceed auding/listening comprehension. Finally, there is ample evidence that listening comprehension is a strong predictor of reading comprehension.

If the complexity of listening (or viewing/watching) comprehension is accepted, it can be argued further that reflecting on and manipulating the through-the-air information captured on CD or DVD is also complex (Paul & Wang, 2012). Of course, the skills required for developing listening comprehension are different from those required for reading comprehension. However, the contents of academic audiobooks (or sign books) can be just as difficult to understand as those delivered in print books. As mentioned previously, students still need a level of competency in the colloquial use of language in order to access or acquire academic language. This is true regardless of whether the academic language is delivered through-the-air or captured in print or in non-print modes. Developing literate thought via the use of audio- or sign books is possible and might be a viable alternative (or an addition) to developing literate thought via print books.

Types of Literacies and Access/Interpretation

To continue with the reconceptualization of literacy, this section discusses types of literacies and the access/interpretation concept. Only two broad types of literacy are briefly discussed here: print and performance (oral or signed) (see Paul, 2018; Paul & Wang, 2006, 2012, for a detailed discussion of these types plus caption literacy). Each type of literacy has access and interpretation requirements.

Print literacy embodies information that has been captured on paper or electronically via the use of a written language system (e.g., letters, characters, symbols). To access print, readers need skills related to word identification (decoding) as well as knowledge of the language of print (often labeled listening or language comprehension). Critical print interpretation skills refer to the skills of answering questions or retelling or making inferences, involving prior knowledge and metacognition (e.g., Alvermann et al., 2013; Israel, 2007; Israel & Duffy, 2009). Thus, readers cannot interpret or manipulate the print information if they do not have adequate access skills. Of course, adequate access skills do not guarantee print comprehension, especially if readers do not have adequate prior knowledge or metacognitive skills.

Performance has two delivery aspects—it can be delivered through-the-air or captured in audio- or sign books and may involve a variety of genres from dinner conversations to classroom lectures to the oral reading or signing of information in books and other academic materials. The captured performance information does not contain print. The uncaptured through-the-air form may be less demanding linguistically and cognitively than the captured form; however, this depends on the genre. Regardless, there are demands on memory if one listens to a story through-

the-air, compared to having the ability to “replay” the story on a CD or DVD or via a streaming option. Access skills involve “focused” listening and/or viewing/watching, and if the information is comparable, interpretation of the performance aspect is roughly similar to that of print literacy. The influence of other factors such as the prosodic features of a speaker’s voice or signing can be found elsewhere (Paul & Wang, 2012).

This reconceptualization of literacy, entailing types of through-the-air and captured literacies, calls into question the traditional view of “illiteracy”. Illiteracy is traditionally associated with the ability to access and understand written information in print. Thus, individuals are considered illiterate if they cannot access and understand such information. The discussion in the present article thus far implies that individuals are literate if they can access and interpret (e.g., comprehend, apply) learned (e.g., scholarly, academic) information either through-the-air or in captured modes (e.g., print, braille, audio- or sign books). So, it is possible for an individual to be print illiterate, but not illiterate with respect to auding or view/watching. In addition, one can be literate in the auding or viewing/watching mode, but not in the print or written mode. In essence, access in a particular delivery mode (e.g., through-the-air, print, non-print) can lead to, but not guarantee, comprehension or interpretation. Students may need to be taught strategies for improving their comprehension skills.

As argued by Paul (2018):

What does it mean to be illiterate? Historically, the concepts literate and illiterate have been associated with print literacy. If a person was considered literate, this meant he or she could access and interpret information captured in the print or written mode. If a person was labeled illiterate, he or she could not access and interpret information captured in the print mode at a certain literacy level (e.g., functional literacy).

With the reconceptualization of literacy, this question needs to be reframed: Illiterate with respect to what? Print? Braille? Sign? A through-the-air form of a language—speaking or signing? If individuals are print illiterate, despite our best educational efforts, should we attempt to develop literacy in a different mode? Better yet, should we facilitate access to more than one mode of literacy in educational settings throughout compulsory education? Taking this route might address the issues of accessibility and equity. (p. 83)

At the least, this reconceptualization of literacy asserts the need for educators to consider multiple means of representation and delivery of information for instruction, curriculum, and assessment, which brings up the notion of Universal Design for Learning (UDL), as discussed in the ensuing section.

Literate Thought and UDL

To understand the connection between literate thought and Universal Design for Learning (UDL), brief background information on UDL needs to be presented. The concept UDL emerged from the early legislation in the United States involving civil rights and special education (Coyne et al., 2012; Hartmann, 2011; Rose & Gravel, 2010). In the late 1980s, researchers at the Center for Applied Special Technologies (<https://www.cast.org/>) envisioned and incorporated advances from three conceptual movements: advancements in architectural design, developments in education technology, and discoveries from brain research. The framework for UDL was organized around three broad principles that guide the development of instruction, curriculum, and assessment. This framework provided an inclusive and accessible learning environment for all learners, including learners with disabilities and those who are limited speakers of a verbal or spoken language.

The three UDL principles are:

1. Provide multiple means of representation; namely, offer a variety of and flexible ways to deliver information.
2. Provide multiple means of action and expression; that is, flexible options for learning styles and demonstrations/expressions of knowledge.
3. Provide multiple means of engagement; namely, flexible options for generating and sustaining motivation and interest.

Although literate thought can incorporate all three UDL principles, it is most directly connected to the first one—providing multiple means of representations. This can be seen in the discussion of various types of literacies, which are characterized as delivery modes of information. The other two UDL principles can also be applied in developing literate thinking skills in the through-the-air or captured mode. In fact, all three UDL principles are relevant for facilitating the acquisition of the three broad requisites for critical literate thinking skills: (1) adequate proficiency in a bona fide language; (2) representing and manipulating a metalanguage—that is, a specialized vocabulary of a discipline or topic or area, and (3) possessing the ability to access and interpret academic or literate language (Paul & Wang, 2006, 2012).

UDL involves or should involve the use of multimedia, for example, computerized instruction or presentation of information and so on. Research on educational media and deafness in the United States has a long tradition, particularly via the convening of several annual conferences (e.g., see discussion in Paul, *in press*). Educational media has been utilized with d/Dhh students for a number of academic areas, especially for the teaching of language and literacy skills in the USA and other countries (e.g., Adnyani et al., 2021; Gentry et al., 2004/2005; Golos & Moses, 2013; Nikolaraizi et al., 2013; Saddhono et al., 2019).

It can be argued that UDL is a tool for developing literate thinking skills as well as an avenue for facilitating the acquisition of knowledge.

Both literate thought and UDL defy the one-size-fits-all paradigm. Focusing on concepts such as accessibility, flexibility, and accommodations among others, UDL in conjunction with literate thought acknowledge the need to differentiate instruction, curriculum, and assessment. This should increase motivation and engagement—critical factors in the learning processes of students.

CONCLUDING REMARKS

In the present article, it is argued that literacy should be reconceptualized with a focus on types of literacies and the development of access and interpretation skills associated with a particular type. This reconceptualization, in conjunction with Universal Design for Learning and the use of technology, offers multiple paths for developing high-level critical literate thinking skills in children and adolescents who have been struggling with print literacy. Indeed, a number of these individuals might prefer alternatives to or, at least, additional options than print (e.g., see Wang & Al-Said, 2014). It might also be the case that a fixed medium such as print is not sufficient, by itself, for meeting the complex challenging needs of a diverse society (e.g., see various chapters in Ellsworth et al., 1994; Paul & Wang, 2012). The use of alternative or additional delivery modes might be a viable process for promoting diversity and inclusiveness and for mitigating factors that impede the development of cognition. Practically, this should address the need to differentiate instruction, curriculum, and assessment for students.

Literate thought should be considered as a paradigm for cognition. The ability to think creatively, critically, logically, and rationally can be developed in non-captured (i.e., through-the-air, speaking, signing) and captured (e.g., print, Braille, audio-sign books, etc.) venues. With respect to access and interpretation, it is shown that the relationship between a specific captured mode and its non-captured counterpart is reciprocal and facilitative. In addition, to access and interpret academic information in the through-the-air mode requires an adequate level of competency in the colloquial usage of a language. Proficiency in the colloquial usage is necessary for the acquisition and development of academic language, found in learned materials.

There are still a few questions that should be considered and researched (Paul, 2018; Paul & Wang, 2012). For example:

- Is it cost effective and realistic to convert all learned information available in print to alternative non-print modes? [Some conversions are required by law in the United States.]
- What are the issues of converting learned information available in one language (such as English, etc.) to print and non-print modes involving other languages, spoken in a particular country? Should this be considered with respect to the growing populations of students who are limited speakers of the language of the majority or dominant culture?

- Is competency in non-print modes (audio-and sign books) only sufficient for participation in scientific, technological societies that are predominantly dependent on the written word?
- What are evidence-based practices for developing literate thought in any delivery mode?

The above list of questions is, obviously, not exhaustive. In closing, it is incumbent on educators and researchers to focus on the acquisition and development of literate thought—which should be the main or predominant goal in the education of d/Deaf and hard of hearing students, indeed for all students.

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