Chapter 4
Deconstructing the Literacy Dilemma: Predicating a Search for Clarity and Cohesiveness

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Abstract Although recent views of literacy have expanded to acknowledge a wide range of literacies, the field has yet to articulate how to integrate these into a cohesive construct of literacy for 21st century education. In this chapter, I look at factors that fuel the teacher educator's literacy dilemma: beliefs about teaching and literacy; influences of policies on curriculum and practice; lack of cohesiveness and clarity in the field; and insufficient preparation for the transdisciplinary basis of 21st century literacy instruction. Then, positing that the first step is to focus in on the lack of clarity and cohesiveness, I draw attention to the role of the senses and human perception within the transformative process of literacy. Noting the alignment of this construct of literacy as sense-making with classic and 21st century literacy theories, I look more closely at what transdisciplinary scholars are investigating within 21st century literacy constructs, including concepts of materiality and embodiment, semiotics, signs and codes. Arguing that making meaning, or making *sense*, is the functional essence of literacy across the seemingly fragmented characterizations that have emerged in the field, I sketch out an initial case for our evolving construct of literacy as sense-making.

Keywords Literacy teaching · Education policy · Teacher beliefs · Future skills · Transliteracy · Materiality · Embodiment · Semiotics · Signs · Codes · Multimodal analysis · Sense-making · Transformative processes · Transactional theory · Multiliteracies theory · Sensory perception · Transdiciplinary · 21st century learning

Sketches Inquiring into the Teacher Educators' Dilemma

As teacher educators seek to resolve the tensions between the dynamic 21st century literacy scholarship vs. the established twentieth century literacy education practices that remain dominant in pre-K-12 schooling, the dilemma becomes apparent: *what should be the frame for literacy in 21st century education?* Points made in the opening chapters are relevant to this question and I restate these here:

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- Scholars, institutions, and organizations across the globe assert that definitions of literacy are fluid, not fixed (Keefe & Copeland, 2011; Mackey, 2004).
- Long-standing print-based views of literacy are no longer adequate for 21st century demands (Mills, 2009, 2016).
- The proliferation of literacies (e.g., digital literacy, critical literacy, multiliteracies, multimodal literacy) suggests that more wide-ranging views of literacy are beginning to be recognized in the broader educational discourse, particularly as the world attempts to respond to advances in technology and increasing globalization.
- It seems that despite the acknowledgment that print-based literacy alone is insufficient for our current and future lives, there seems to be little substantive difference in how literacy is enacted in education policy and practice. Rather, we find that in the real world of our schools and university teacher education programs, our 21st century literacy teaching looks strikingly similar to the print-focused pedagogy that was prevalent in the recent twentieth century.

These points give early shape to our dilemma as teacher educators. There is no clear definition of literacy and the world of the 21st century requires a dynamic characterization of the term, yet schools and policies keep us focused on developing literacy capacities that were established in the twentieth century. When faced with the question, *what should be the frame for literacy in 21st century education?* teacher educators are torn between preparing teachers for the world of the 21st century or the domain of the schools in which they will teach.

Early Concerns: "Particular Anxiety About How to Proceed"

Awareness of this incongruity emerged early as educational stakeholders anticipated the future. In the years leading up to our new millennium, international rhetoric pressed for a 21st century learning agenda and, thus, inspired scholars and researchers to consider what that actually meant in an increasingly digital and global world. Significant among those exploring this complex issue were the New London Group (1996) whose classic work, "A Pedagogy of Multiliteracies: Designing Social Futures," was briefly discussed throughout our opening chapters of this volume. In a rapidly changing world faced with the important question of how educators could address the diversity of contexts and multiplicity of textual forms, the New London Group (1996) observed, "although numerous theories and practices have been developed as possible responses, at the moment there seems to be particular anxiety about how to proceed" (p. 61). Almost thirty years after the New London Group made this statement, it seems that education is still unsure of how to proceed. Literacy practices promoted in teacher education remain predominantly focused upon teaching decoding of print-based texts from an autonomous model of literacy (Street, 2006) or what New London Group (1996) terms "mere literacy" (p. 64), despite the compelling rationales for a "literacies" approach that encourage rethinking of our literacy practices.

Like many teacher educators who come to this intersection of literacy and literacies, Kelli Jo and I are caught up in that anxiety of the inevitable dilemma: what do we teach? The many colliding constructs of literacy and literacies within the educational milieu of theory, research, and policy have left us with feeble resolutions for practice; resolutions that fail to reconcile the many perspectives of literacy and literacies. As with any dilemma, it is helpful to analyze the problem. Before we can enact change, we must see the need for change, and generate ideas for change (Narey, 2017). So, I begin this chapter by sketching out some of the factors that fuel the literacy dilemma for teacher educators (identifying the need for change) and then, I introduce a direction of inquiry for possible resolution of the dilemma (generating ideas for change) by examining works of classic and 21st century scholars and our evolving construct of 21st century literacy as sense-making that may be a path to enacting change.

Factors that Fuel the Literacy Dilemma for Teacher Educators

Building upon my previous writings on teaching and teacher education, particularly educators' "theories in use" (see, for example, Narey 2009, 2017), I observe that a teacher educator's curriculum and practice generally emerges from a combination of four contributing and sometimes conflicting factors:

- individual and institutional beliefs about the subject to be taught, their purpose in teaching it, and the purpose of teaching in general,
- influences of past and current policies from within and external to their institutions with which they are affiliated, and the relationship of these policies to theory and research,
- the clarity and cohesiveness of the discourse surrounding the current knowledge and advances in the field,
- the teacher educators' individual experiences with and preparation for teaching the current knowledge and advances in the field.

Examining these factors leads to greater understanding of the dilemma facing teacher educators in regard to literacy instruction. This new understanding can then offer potential directions for resolving the dilemma.

Beliefs About Teaching Literacy and Teaching

The first factor that influences a teacher educator's curriculum and practice is a combination of individual and institutional beliefs about a subject, the purpose in teaching it, and the purpose of teaching in general. At the heart of the literacy teacher

education dilemma is this belief of purpose, that is, the "why" of literacy as discussed in the introduction to this volume coupled with perspectives on the "why" of our role as teacher educators that is grounded more broadly in the philosophies of teaching that we embrace. I briefly examine each of these aspects.

Beliefs About Teaching Literacy

In regard to the "why" of the subject to be taught (in this case, literacy), as I have underscored previously, teacher educators' views on teaching literacy are influenced by prevailing beliefs about literacy that extol its value advancing individual human development, socio-political engagement, and economic well-being for all people. Further, I also have pointed out that these beliefs about literacy have been articulated almost exclusively in pedagogy focused on print-based texts that feature a singular sign system. As I have already revealed, there have been, and continue to be, problems with continuing this pedagogic direction into the 21st century. Siefkes (2015) sums up the argument, underscoring,

> language is neither the sole, nor even the dominant sign system. Other sign systems such as gesture, images, graphics, typography have been in use for centuries, yet they were marginalised by philosophic reflection and scientific research due to the influence of linguo-centrism, the tendency of Western cultures to privilege language and downplay other sign systems and sign types. (p. 113)

If our teacher education curricula are not giving attention to other sign systems, then we need to ask if it is merely because of years of enacting a common narrow view rather than because print-based literacy is more important. I believe that the current hierarchical positioning of the varied sign systems should not unduly influence future directions of our work. Rather, teacher education must look forward to determine a literacy definition and curriculum that meets the demands of the 21st century.

Beliefs About Teaching

In regard to philosophic stances on the purpose of teaching in general, I reach back into the turn of the previous century to a similar time of rapid change, to share the words of W. E. B. Du Bois (1903), who argues, "The function of the university is not simply to teach breadwinning, or to furnish teachers for the public schools, or to be a centre of polite society; it is, above all, to be the organ of that fine adjustment between real life and the growing knowledge of life, an adjustment which forms the secret of civilization" (p. 84). As a teacher educator in the rapidly changing 21st century, the belief that education is a means to connect "real life with the growing knowledge of life" is not clearly apparent in the pedagogy enacted in most of the institutions I have observed. Just as in Dubois' time, a number of university

faculty and school administrators frame preservice and inservice teacher education as "training" a workforce and thus have placed the emphasis on passing down a set body of knowledge for the pre-K-12 practitioners to replicate in their classrooms. Thus, in many cases, the resulting curriculum of teacher education has remained inextricably linked to an unchanging knowledge base, that seems decontextualized from the literacies needed for our 21st century teachers to connect real life and the growing knowledge of life. In order to move forward, it may be necessary for teacher educators to critically examine their beliefs about the purpose of teacher education.

Influence of Policies on Curriculum and Practice

Past and current policies can reinforce personal beliefs and/or influence educators' practices. Some policies are external, emanating from political (e.g., national or state governments) or professional (e.g., Council for the Accreditation of Teacher Preparation (CAEP) governing bodies. Other policies are internal to the teacher educators' institutions (e.g., college or department) but can additionally reflect policies relative to those Pre-12 institutions to which their teacher education programs are affiliated.

As teacher educators consider how policies embody theory and practice, they might anticipate a fairly straightforward relationship, yet in reality, the extent to which policies promote the latest theory and research varies. Further, the theory and research upon which the policies are based are often subject to narrow or agenda-driven selection by these governing bodies. Describing how this practice has been prevalent in reading policy, Pearson (2004) contends, "Policy makers like to shroud mandates and initiatives in the rhetoric of science, and sometimes that practice results in strained, if not indefensible, extrapolations from research" (p. 229). "Research is often used in a selective, uneven, and opportunistic manner by policy makers" (Pearson, 2004, p. 240).

An Example: The Influence of the Report of the National Reading Panel

A highly reported example of this is the National Reading Panel (NRP) Report (2000) which drove policy and practice in the United States for years, despite concerns about the research featured in the report as expressed in the Minority View written by the lone educator on the panel, Joanne Yatvin (2000). The NRP report was used to support the research agenda of the National Institute of Child Health and Human Development and the Reading First initiative of the federal "No Child Left Behind" Act of 2001. Yet, in her Minority View, Yatvin (2000) writes that the NRP report is

> unbalanced and, to some extent, irrelevant. But because of these deficiencies, bad things will happen. Summaries of, and sound bites about, the Panel's findings will be used to make policy decisions at the national, state, and local levels. Topics that were never investigated will be misconstrued as failed practices. Unanswered questions will be assumed to have been answered negatively. Unfortunately, most policymakers and ordinary citizens will not read the full reviews. They will not see the Panel's explanations about why so few topics were investigated or its judgments that the results of research on some of the topics are inconclusive. They will not hear the Panel's calls for more and more fine-tuned research. Ironically, the report that Congress intended to be a boon to the teaching of reading will turn out to be a further detriment. (p. 3)

In an opinion article in *Education Week*, Yatvin (2003) describes how her Minority View concerns had been brought to fruition, noting that

> promoters of phonics have twisted [NRP report] findings in an effort to reconfigure all school reading instruction and all teacher preparation in reading to conform with their own ideas of how reading should be taught. In the process of applying for federal funds through Reading First, states that have designed successful models of teacher training and school districts that have developed effective reading programs have been told that their plans are not sufficiently "scientific," or "systematic," and that they will have to change them. University professors of reading have been criticized for not having evidence of "knowledge of research-based methods" in their vitae. In short, any program or any educator that does not fit with today's fashionable orthodoxy is considered unfit for the teaching of reading. (https://www.edweek.org/ew/articles/2003/04/30/33yatvin.h22.html)

In the *Education Week* article, Yatvin utilizes an enlightening True-False format to detail how the NRP report has been misinterpreted and misused. As a teacher educator, who has observed the widespread teaching of the so-called "five pillars" or "essentials" of reading instruction (phonemic awareness. phonics, fluency, vocabulary, comprehension), I find Yatvin's discussion of these so-called five "essentials" particularly noteworthy:

> Nowhere in its report does the panel assert that the strategies found effective are the "essentials" of reading instruction. That determination was made elsewhere, embodied in the No Child Left Behind Act, and then included in the guidelines for Reading First. Ultimately, references to the "five essentials of reading" appeared in state applications, media commentaries, and promotional literature for various commercial programs. (Yatvin, 2003, https://www.edweek.org/ew/articles/2003/04/30/33yatvin.h22.html)

Other scholars (see for example, Krashen, 2001; Shaker and Heilman, 2010) also have drawn attention to the misrepresentations, misconceptions, influence, and concerns surrounding the National Reading Panel Report. Adding to this concern about the "selective, uneven, and opportunistic" (Pearson, 2004, p. 240) use of research in policy, it is important to note the influence of such policies on beliefs about literacy. In her article, "Beyond Smoke and Mirrors: A Critique of the National Reading Panel Report on Phonics," Elaine Garan (2001) notes how members of the broader education community were found to react to theory and research on the basis of its agreement with their own personal philosophical beliefs, rather than base their critique on an objective analysis of the merits of the theories or research in question. Garan finds that teachers, having been taught in preservice and inservice education that phonics was essential and/or having experienced this stance on phonics in their

own education, have integrated this notion into their belief systems and therefore, did not question the faulty research base of the NPR report, even when it was brought to their attention.

Policies Contribute to Teacher Educator's Dilemma

The example of the National Reading Panel's report underscores how policies influence literacy curriculum and practice. In nations where high stakes accountability measures ("the test") drive curriculum, where minimal time seems left for anything beyond what is "testable" within the narrowly-focused verbocentric literacy framework, teacher educators often are torn in deciding whether to shape their university programs to the pressures of the accountability or to the current research in the field. As this section illustrates, policies greatly contribute to the teacher educator's dilemma: *how do we frame 21st century literacy instruction?*

Lack of Cohesiveness and Clarity in the Field

Although the field, in general, has embraced, or at least acknowledged that literacy goes beyond the ability to encode (i.e., produce) and decode (i.e., interpret) verbal language (print literacy), teacher education has yet to develop a unifying approach to literacy instruction. As Kelli Jo outlined in the previous chapter, 21st century demands for the development of learners' capacities to critically and effectively engage with a range of textual forms in various media through multiple modalities have led to the emergence of a cacophony of literacies. While we can attempt to define and sort through the growing list to get a sense of direction across the 21st century literacy landscape, the general lack of cohesiveness and clarity continues to pose a dilemma for teacher educators.

Complicating the situation is the seeming lack of coherence relative to the prevailing construct and cohesion across these many literacies. While the notion of literacy has expanded, "newer" forms of literacy seem to be positioned on the periphery as supplemental to, or even in support of a verbally-based conceptualization of literacy. Even the term, "multiliteracies," which was originally coined to draw attention to multiple forms of literacy, or "digital literacy" which was a response to the rapidly changing technology landscape, might now be inferred as representing something different, or separate from literacy. Adding to the confusion, the emergence of further "literacies" such as financial, historical, marketing, information, statistical, for example, set up a quandary as to pedagogical direction and subject area responsibility. Here foci for instruction may be related not so much to the idea of communicative meaning-making but rather, directed to knowledge and skills within the narrow frame of these specific content areas. Thus, as explored in the previous chapter, it should not be surprising that 21st century literacy poses a dilemma for many teacher educators.

Insufficient Preparation and Experience

Furthermore, I generally observe that educators' experience with and preparation for teaching the varied literacies is spotty: the extent to which literacy teaching goes beyond a print-based focus is largely dependent upon teacher education programs and efforts of individual educators themselves. One major aspect of the problem is that the teacher educators, and subsequently, the practitioners whom they teach, lack sufficient background in theory, research, and practice beyond traditional print literacy (Kosnik, Menna, Dharamshi, & Miyata, 2017). While a number of teacher educators recognize the value of and attempt to support expanded views of literacy, in general, their education and experiences are frequently limited to expertise in the twentieth century notions literacy that are focused upon decoding and encoding symbols representing sound relationship to spoken language (print) (Narey, 2017; Whitty, 2014). Literacy researchers note that advances toward broader characterizations have yet to play out in the reality of schools (Siegel, 2012). This observation supports my own experiences, so I continue to deliberate, why not in schools?

Some see the problem as insufficient preparation and experience in subject areas beyond the narrow focus of print-based instruction. For instance, Siegel (2012) comments upon her own lack of experience with visual modes, noting how other language arts teachers with visual arts experiences appear to more readily and effectively enact a broader literacy construct in their instruction. She brings urgency to the problem by framing schools' verboocentrism as a social justice concern and argues that it is critical that "teachers and students become skilled readers of multimodal designs in all their variety" (Siegel, 2012, p. 676). In a similar vein, Chandler's (2017) research into the extent to which teachers are prepared to teach multimodal authoring underscores the lack of specialized knowledge from other disciplines that is required for multimodal work. His studies of teachers in Australia reveal that the move towards a broader literacy definition "within mandated curricula, may assume a level of capability of teachers that is simply not justified" (p. 14). He calls for schools, school systems, and teachers themselves to address this deficiency. The capacity to see the need for, develop, and enact a broad definition of literacy requires preparation and experience beyond a narrow "expertise" in print-based textual forms.

It seems, however, that teacher educators (and practitioners) who seek to expand their understandings of literacy beyond their schooled expertise with print typically must learn about other theoretical perspectives and practices on their own. The process requires educators' motivation, thoughtful applications to practice, and ongoing reflections (see for example Kerry-Moran, 2017) as they attempt to break through disciplinary borders to locate and synthesize the wide range of resources that can inform their literacy instruction. Yet, even highly motivated teacher educators can find this challenging. Within the milieu of current educational policies that emphasize traditional print literacy, educators' needs to meet program requirements amid other professional responsibilities often leave little time for these studies in

fields beyond their own. Thus, it is understandable that teacher educators' and practitioners' understandings of literacy beyond print frequently lack depth and substance that a transdisciplinary understanding would promote.

How Do We Respond to These Influences?

My contention is that these four significant and overlapping strands of influence have contributed to keeping teacher education bound to a twentieth century verbocentric curriculum and autonomous model of pedagogy (Street, 2006) despite the range of texts and the increasing 21st century demands for developing literacy across these texts. Having put forth this overview identifying the need for change, the next step will be to generate ideas for change. Contemplating the four influential factors, it would seem that as teacher educators, we can do little about beliefs, policies, or preparation until we deal with the lack of clarity and cohesiveness in the field. Therefore, I focus my next sketch on seeking a cohesive frame for 21st century literacy.

Seeking a Cohesive Frame for 21st Century Literacy

In our daily lives, we engage in a variety of acts that call upon a range of literacies. We decipher legal contracts and nutrition labels; we ponder maps and puzzle over instructions for assembling bookcases; we develop playlists for weddings and for workouts. Some of us contemplate the varied effects of light when studying Renaissance paintings while others apply similar considerations when planning perfect selfie shots. We discern weather patterns and stock market trends; revise lines of poems and lines of computer code; and analyze golf swings and dance moves. We distinguish the acidity in wine and a missing ingredient in a sauce; we create spaces for calm and for excitement; experiment with dressing up and dressing down; replicate fashion trends and invent our own. We read the room and the trail. We detect the basis for infants' cries and teenagers' silences. Each encounter is an opportunity to engage with people, systems, and objects to understand, to make sense of and in our worlds.

Thus, it is clear, that, as humans, we produce and interpret signs and critically analyze and assess a broad range of textual forms, as we aspire to become literate across this multiplicity of texts. Yet, often, our notions of literacy are confined to making meaning only of texts that feature signs representing spoken language. These "traditional texts" (i.e., books, scrolls) include alphabetic writing systems with characters arranged in letter-sound relationship based groupings (e.g., English, German); logographic writing systems in which pictographs (i.e., visual representations of physical objects) and ideographs (i.e., signs that represent ideas) are used

(e.g., Chinese). However, when addressing the power and potential of 21st century literacy, we must acknowledge that this print-based frame for literacy with its focus on learning singular sign systems, represent only a fraction of how humans make sense of their worlds. As Kelli Jo underscored in Chapter Three, the reason that scholars and researchers have put forth so many literacies is because the twentieth century emphasis on print along with the manner in which it was taught was insufficient in meeting the needs of the 21st century learners. While adopting and enacting effective instruction in these many literacies would go far in preparing learners for our new era, the significant amount of knowledge and skills required for integrating these into a burgeoning teacher education curriculum poses a dilemma for teacher educators.

I believe that the teacher educator's literacy dilemma can be resolved, not by insisting we become experts in multiple disciplines, but rather, by shaking up the prevailing hierarchy wherein print literacy currently reigns. Pondering the four factors that influence teacher educators' practices that I highlighted in the previous section, I make a case for considering a construct of literacy that can bring the multiple textual forms and diverse sign systems that are embedded in our past and that may be imagined in our future into a focused direction that can guide our literacy instruction today. This does not mean that teacher educators should eliminate print-focused literacy curricula from their programs or refrain from passing on rich traditions of print-based literature. Nor does it mean that teacher educators must try to fit the study of each of the growing list of literacies into their courses. Rather, what is needed is for teacher educators to problematize the framing of literacy in their teacher education programs and seek to develop a clear and cohesive frame for instruction wherein the teaching of print, or "mere literacy" (New London Group, 1996, p. 64) is no longer privileged to the exclusion of other valuable and viable foci for literacy instruction. The identification of a clear and cohesive anti-hierarchical frame can serve to facilitate alignment with teacher education policies and a rethinking of what may be important preparation for teacher education. To this end, I propose that a sense-making construct of literacy can serve as a clear, cohesive frame for 21st century education.

Sense-Making: A Construct for a Dynamic, Global World

Although the concept of sense-making is grounded in classic writings of John Dewey (1934) and other early thinkers (see for instance, James, 1983/1890; Simmel, 1997/1907), there has been a notable surge of interest in sense-making across a wide expanse of the 21st century discourse. Both classic and new perspectives on sense-making underscore desired features of a 21st century construct of literacy: one that frames literacy as a transformative and dynamic creative process that can advance individual human development, socio-political engagement, and economic well-being in an increasingly global, digital, diverse, and rapidly-changing world. Throughout the remainder of this chapter, I will sketch out these perspectives.

The Concept of Sense-Making Across the 21st Century Discourse

As I have asserted here and in previous work, the construct of literacy as sense-making employs the term "sense" in two ways: (1) sense, as the creative process of making meaning and (2) sense "as related to modalities (sight, hearing)" (Narey, 2017, p. 329). These two implications may be evidenced across a wide review of the 21st century literature and while I explore these dual concepts in depth throughout this chapter, I offer a brief overview here. First, I note that sense-making is a creative process that is frequently identified as a critical dynamic and transformational skill for the 21st century. Secondly, I draw attention to sensory studies and the emerging recognition of the role that the senses play in literacy development.

Sense-Making as the Creative Process of Meaning Making

Over the past decade, sense-making has emerged as an important topic across the broad 21st century discourse. Noting that sense-making is central to organizational leadership studies, Ancona (2012) defines the term as "coming up with plausible understandings and meanings; testing them with others and via action; and then refining our understandings or abandoning them in favor of new ones that better explain a shifting reality" (p. 5). Weick (1995) underscores the individual and collaborative creativity involved as he explains sense-making as a process inseparably "grounded in both individual and social activity" (p. 6) that is "less about discovery than it is about invention" (p. 13). From the design field, Kolko (2010) defines "sense-making as an action-oriented process that people automatically go through in order to integrate experiences into their understanding of the world around them" (p. 18).

Particularly relevant to the widespread belief that literacy is a means to economic opportunity, sense-making is listed first of the ten skills identified by the Institute for the Future (IFTF). Report authors, Davies, Fidler, and Gorbis (2011) identify sense-making as critical for the future workforce and define sense-making as "ability to determine the deeper meaning or significance of what is being expressed" (p. 8). In the IFTF updated report, *Future Work Skills 2020*, Fidler (2016) explains:

> As smart machines are used for more routine manufacturing and service jobs, there will be an increasing demand for the kinds of skills that machines do not perform well. These are higher-level cognitive skills that cannot be engineered into mechanical systems. We call these "sense-making skills" or skills that help us to create unique insights that are critical to decision-making. (p. 21)

Among the other skills listed in the IFTF report (Davies et al, 2011), I draw attention to several skills that also substantively support the conceptualization of literacy as the creative act of sense-making. These include:

- Novel and Adaptive Thinking: "proficiency at thinking and coming up with solutions and responses beyond that which is rote or rule-based" (p. 9)

- Computational Thinking: "ability to translate vast amounts of data into abstract concepts and to understand data-based reasoning" (p. 10)
- New Media Literacy: "ability to critically assess and develop content that uses new media forms, and to leverage these media for persuasive communication" (p. 10)
- Transdisciplinarity: "literacy in and ability to understand concepts across multiple disciplines" (p. 11).

These identified requirements for living in the 21st century call attention to the need for the development of individual and collaborative creativity, visualization and abstract thinking, communicational fluency across media, and transdisciplinary approaches to conceptualizations of experience. Further review of the 21st century literature reveals the role that sensory perceptions play in the development and enhancement of these skills and reinforce the dual connotations implied by sense-making.

Making Sense Through, and of, Our Sensory Perceptions

Viewing literacy as sense-making underscores the role that human senses play in meaning making. Canadian communication theorist, Marshall McLuhan (1964), points out that humans decipher information with their senses. In the diverse and growing field of sensory studies, scholars (see for instance, Classen, 1993, 2005; Low, 2012; Sutton, 2005) explore the role of olfactory (odor, smell), thermal (heat, cool), kinesthetic (movement), and other senses for perception. These sensory studies underscore not only research into individual senses, but, more critically, promote the analysis of multisensory or intersensory processes (Sutton, 2005).

Danesi (2012) explains that while people are generally born with similar sensory capacities, their social settings influence the level of the sense or senses employed to record or transmit a message. He notes, for instance, that in oral cultures the auditory sense is critical and in print cultures the visual sense is important. Therefore, we can view sensory perception as an individual means of making meaning that can be shaped by social context as individuals strive to communicate with each other.

Scholars working specifically in the area of 21st century literacy also note the recent broadening of sensory scholarship in the field. Mills (2016) explains, "The sensory literacies approach is a revitalized way of thinking about the multisensoriality of literacy and communication practices, including their technologies of mediation and production" (p. 137). Mills (2016) underscores that when humans communicate, the "body is central to the practical enactment of the interaction. Therefore, the body should be explicitly foregrounded in any theory about the process of meaning making" (p. 139).

Studies of the senses and sensory perception provide greater insights into meaning making. Further, our understanding of sensory perception will enhance our capacity

to develop the identified skills required for sense-making in the 21st century: individual and collaborative creativity, visualization and abstract thinking, communicational fluency across media, and transdisciplinary approaches to conceptualizations of experience.

A Reciprocal Relationship

In regard to this rising focus on sense-making in the 21st century discourse, it is important to understand that although scholars across the literature may emphasize one strand or the other: "sense" as related to meaning making or "sense" as related to modalities, these are not separate concepts. Rather, there is a reciprocal relationship between the two in that we make sense through and of our sensory perceptions. To advance literacy in the 21st century, we will need to address both.

Examining the Theoretical Basis for Literacy as Sense-Making

Although literacy as sense-making may be supported by numerous theoretical frameworks, I focus upon two that I believe most clearly demonstrate literacy as the creative process required for constructs of literacy in the 21st century and that allow us to think about literacy in a way that will address the many concerns regarding print-based perspectives. First, I discuss Louise Rosenblatt's (1969) classic Transactional Theory of Reading and then follow with the more recent New London Group's (1996) Theory of Multiliteracies. My overviews of these theories reveal a shared perspective that meaning does not reside in the text, but rather, results from a dynamic and transformative ongoing creative process of construction and reconstruction. Further, both theories project a notion of text as fluid, rather than fixed and describe meaning to be subject to the individual and social contexts.

Rosenblatt's Transactional Theory of Reading

Renowned literacy theorist, Louise Rosenblatt (1993) explains that her work in anthropology and aesthetics along with her study of semiotics (the study of signs) and the writings of Charles Sanders Peirce, William James, and John Dewey led her to go beyond the conventional literacy stances of the times. Rejecting the autonomous model (Street, 2006) of literacy, Rosenblatt's (1938) early reader response theory challenges the perspective that some "correct" meaning is embedded in the text. From this theoretical perspective, Rosenblatt argues

> The reader brings to the work personality traits, memories of past events, present needs and preoccupations, a particular mood of the moment, and a particular physical condition. These and many other elements in a never-to-be duplicated combination determine his response to the peculiar contribution of the text. (Rosenblatt, 1938, pp. 30–31)

Later, Rosenblatt (1969) elaborates upon this early theoretical work with her, expanded transactional theory of reading, noting:

> Hence the "meaning" of any element in the system of signs in the text is conditioned not only by its verbal context, but also by the context provided by the reader's past experience and present expectations and purpose. Out of this emerges the new experience generated by the encounter with the text. Thus, the coming together of a particular text and a particular reader creates the possibility of a unique process, a unique work. (Rosenblatt, 1969, pp. 42–43)

In this later theory, Rosenblatt (1969;1985;1993) deliberately uses the term "transaction" instead of "interaction," explaining that "interaction" connotes that there is either a dominance of reader or text: a dualism that she rebuffs. Rosenblatt (1969) credits the origin of the term "transaction" to John Dewey and Arthur F. Bentley who attempted to find a word to "counteract the nineteenth-century phrasing of phenomena as an interaction between different factors, as of two separate, self-contained, and already defined entities acting on one another" (p. 43). Rosenblatt (1969) points out, "Dewey rejected the simple stimulus-response notion in which the organism passively receives the stimulus, and pointed out that to some extent the organism selects out the stimulus to which it will respond" (p. 44).

Pearson (2009) explains that Rosenblatt's expanded theory views meaning as "a new entity that resides above the reader-text interaction. Meaning is therefore, neither subject nor object nor the interaction of the two. Instead it is transaction, something new and different" (Pearson, 2009, p. 20). Pearson notes that Smagorinsky's (2001) cultural model of reading further articulates Rosenblatt's (1982) explanation of transactional theory to assert "readers quite literally compose new texts in response to texts they read; their recompositions are based upon the evocations (links to prior texts and experiences) that occur during the act of reading within a context that also shapes the type and manner of interpretations they make" (Pearson, 2009, p. 21).

New London Group's Theory of Multiliteracies

The New London Group's (1996) Theory of Multiliteracies is a theory of discourse that "sees semiotic activity as a creative application and combination of conventions (resources-Available Designs)" (p. 74), wherein the emerging meaning is constantly being re-presented and re-conceptualized in an iterative process of choosing to engage in the *Designing* of the *Available Design* which then becomes the *Redesigned* (as well as a new *Available Design*). Group members Cope and Kalantzis (2013) offer a brief explanation of these components:

> Available Designs (found representational forms); the Designing one does (the work you do when you make meaning, how you appropriate and revoice and transform Available

> Designs); and The Redesigned (how, through the act of Designing, the world and the person are transformed). (Cope & Kalantzis, 2013, p. 116)

I have elaborated upon this explanation of meaning-making, or sense-making in alignment with my own theoretical model of creativity (see Narey, 2017):

> Available Designs are the texts we encounter (seeing need for change). In Designing, we actively select and make meaning of the text (formulating ideas for change). The Redesigned is the text we produce in the act of designing that transforms the Available Design as well as the designer (enacting change). The Redesigned then becomes an Available Design for others to encounter, or for us to "re"-encounter. (Narey, 2017, p. 320)

Like Rosenblatt's (1978) transactional theory, the text is fluid, not fixed, and there is dynamic tension among the elements that is influenced by individual and social contexts.

> The concept of Design emphasizes the relationships between received modes of meaning (Available Designs), the transformation of these modes of meaning in their hybrid and intertextual use (Designing), and their subsequent to-be-received status (The Redesigned). The metalanguage of meaning-making applies to all aspects of this process: how people are positioned by the elements of available modes of meaning (Available Designs), yet how the authors of meanings in some important senses bear the responsibility of being consciously in control of their transformation of meanings (Designing), and how the effects of meaning, the sedimentation of meaning, become a part of the social process (The Redesigned). (New London Group, 1996, p. 81)

The New London Group (1996) offers popular music as an example of the hybridity implied in the process:

> Different cultural forms and traditions are constantly being recombined and restructured—where the musical forms of Africa meet audio electronics and the commercial music industry. And new relations are constantly being created between linguistic meanings and audio meanings (pop versus rap) and between linguistic/audio and visual meanings (live performance versus video clips). (p. 82)

As underscored in the previous chapters, literacy instruction for 21st century education must account for multiliteracies, digital literacy, multimodal literacy, critical literacy, and a seemingly endless list of other literacies to prepare diverse learners for their futures in a complex, ever-changing world. Drawing upon the two highlighted theoretical perspectives (Transactional Theory of Reading and Theory of Multiliteracies), my evolving construct of literacy as sense-making begins to reconcile the multiple 21st century concerns of a changing environment; the diversity of individuals, contexts, cultures; and the ethics/values at play.

Crossing Disciplinary Boundaries to Frame a Construct of 21st Century Literacy

Determining a clear and cohesive path for 21st century literacy requires a shift in thinking about literacy. As I continue to argue, teacher education must move from the

hierarchical privileging of print-based sign systems towards a greater emphasis on teaching how to make meaning across the diverse range of texts in our real world 21st century and beyond. To do this, we must be willing to see beyond (and to fearlessly cross) the boundaries of our fields as many scholars, researchers, and theorists have done and continue to do. Working within and across such varied fields of linguistics, semiotics, psychology, history, science, mathematics, sociology, arts, philosophy, and anthropology, these scholars view knowledge as transdisciplinary; that is, "that which is at once between the disciplines, across the different disciplines, and beyond all discipline. Its goal is the understanding of the present world, of which one of the imperatives is the unity of knowledge" (Nicolescu, 2010, p. 22).

Just as Louise Rosenblatt (1993) brought semiotics, anthropology, and aesthetics to her theoretical stance, numerous literacy scholars have embraced a transdisciplinary perspective. For example, in their article, "The Literacies of Things," published in the *Journal of Early Childhood Literacy*, literacy scholars, Thiel and Jones (2017) draw upon physicist Karen Barad's (2007) transdisciplinary investigations into quantum physics, matter, and meaning wherein Barad states, "questions of space, time, and matter are intimately connected, indeed entangled with questions of justice" (p. 236). In their literacy article, Theil and Jones describe transforming an informal learning center space in a working-class neighborhood, explaining their efforts to "explore the object as a material-discursive apparatus in the production of literacies, particularly literacies of race and class" (p. 315). They note that transdisciplinary work like Barad's, "offers a way to reconfigure literacies as active and lively, animated through human and non-human intra-actions rather than static constructs" (Thiel & Jones, 2017, p. 333).

Important Concepts Highlighted in 21st Century Literacy Studies

To provide background for the evolving notion of literacy as sense-making, I sketch out summaries of several important concepts highlighted in 21st century literacy studies. These are the field of semiotics, and the nature of signs and codes and theories of materiality and embodiment. Each of these summaries underscore the understanding that 21st century literacy studies are by nature transdisciplinary in that they deal with concepts for meaning-making that are not bound to any one body of knowledge, but rather emerge from scholars' and researchers' work across disciplinary boundaries. The summaries provide a useful overview of aspects of meaning making critical to 21st century literacy.

Semiotics: Signs and Codes

Thomas A. Sebeok (2001), respected professor of semiotics and communication theory, writes,

> Each species produces and understands certain kinds of specific signs for which it has been programmed by its biology. These can range from simple bodily signals to advanced symbolic structures such as words. Signs allow each species to (1) signal its existence,
>
> (2) communicate messages within the species, and (3) model incoming information from the external world. Semiotics is the science that studies these functions. (p. 3)

Deriving from Greek *semesion*, meaning sign, "semiotic is the study of signs or an epistemology about the existence or the actuality of sign in societal life" (Yakin & Totu, 2014, p. 4). In his classic work, *Semiotics: The Basics, s*emiotician Daniel Chandler (2007) describes our human species as "*homo significans*" or "meaning-makers" who create and interpret meaning through signs, explaining, "Signs take the form of words, images, sounds, odours, flavours, acts or objects" (p. 13). Chandler goes on to point out, "such things have no intrinsic meaning and become signs only when we invest them with meaning" (p. 13). His perspective follows the Peircean model of the sign as laid out by Charles Sanders Peirce, an American scientist, philosopher, and logician whose theories along with those of Swiss linguist Ferdinand de Saussure pioneered the field of semiotics in the twentieth century.

Along with the incorporation of anthropology and sociology into literacy research, the field of semiotics inspired the radical social semiotic turn of the 1980s and 1990s. The new field challenged the status quo of literacy research, scholarship, and practice that previously had focused only on print-based texts. Further, the rise of semiotics established the need for 21st century definitions of literacy in a world where digital advances were rapidly encroaching and there was greater recognition of the need to meet the demands of a diverse and global society (Rowsell & Walsh, 2011). As Danesi (2012) observes,

> with the growth of media, popular culture, and mass communications departments throughout North America, semiotics has made its resurgence, not as a program area of study, but as a major subject area, since it provides a key for deciphering the layers of meanings in media products. (p. 189)

However, he notes that in the United States, often these rely on the objectives of individual instructors whereas in Estonia and Finland, semiotics programs are more established. Dansei reports that in North America, this interest in semiotics is particularly apparent in the marketing and legal professions and notes that edusemiotics is an emerging branch of study in fields focused upon instruction and learning.

Signs

In order to understand how semiotics is critical to notions of being literate, it is useful to look at examples of various signs in our world. Signs may be viewed

categorically as icons, indexes, or symbols. An iconic sign generally looks, sounds, feels, tastes, or smells like the thing it represents. For instance, a photographed, drawn, or painted representation of a subject is an icon. Sound effects, onomatopoeia, and imitative gestures are also icons (Chandler, 2007). Indexical signs link to the subject represented in a less direct way, but the inference to the existence of the subject is observed physically or causally. Examples of indexical signs are smoke (an index of fire), a knock (and index of a visitor at the door), a directional signpost (an index of a particular place), or a smile (an index of a person's happiness). Finally, a symbolic sign has no logical connection to what it represents, so the relationship must be agreed upon and learned. A heart is often noted to be a symbol of love and a skull with crossbones a symbol for poison. While logographic characters are in part considered as having originated as icons (Luk and Bialystok (2005), letters of the alphabet are symbols, as are punctuation marks and numerals.

Specific colors may be used to symbolically represent ideas or concepts, for instance, as Cumming (2007) suggests, in Jan van Eyck's (1434) painting, *The Arnolfini Marriage*, the bride's green dress is a symbol of fertility. Alternately, in some cultures, brides traditionally wear white, and in others, red. For funeral ceremonies, mourning in some cultures is symbolized in wearing black, in others, white, and still others, red. Flags are symbols that can represent nations, but also can represent concepts such as patriotism for that nation. Actions involving a flag can also be regarded as symbolic. These symbolic actions are also subject to interpretation within a culture. For instance, using a flag as wearing apparel is noted as a sign of disrespect (see for instance, US code, Title 4, Section 8d, https://www.law.cornell.edu/uscode/text/4/8), while some citizens adorn themselves with a flag as a sign of their patriotism. Similarly, the symbolic action of displaying a flag, flying a flag upside down, or burning a flag can convey highly emotional and clearly opposite messages to different groups of people.

In regard to any sign or text, it is important to emphasize how arbitrary these are; how much the meaning relies upon the culture or context and/or the participant. For instance, if we just look at the signs used in written language, we see that meaning does not exist in the sign but is dependent upon culture. As a simple example, in English, which uses the Latin alphabet, the sign "P" is a symbol for the English speech sound [pe], whereas in Russian, which uses the Cyrillic alphabet, "P" represents the speech sound that is similar to the English pronunciation of the R sign, [er].

It is also important to note what the participant brings to the production or interpretation of the sign. Regardless of its alphabetic designation, the sign "P" is not a sign for an individual who does not have the sense of sight and it is not associated with a speech sound for a person who is absent the sense of hearing. Rather, these individuals more efficiently utilize other signs for making meaning (e.g., braille; sign-language). Further, some commonly taught literacy strategies (phonics; phonemic awareness) become subject to scrutiny when considering these populations, and some researchers are investigating assessments of learners' literacy achievement based upon phonological aspects (see for example, Mayberry, Del Giudice, & Lieberman, 2011; Narr, 2008). As I continue to demonstrate, the understanding that meaning is dependent

upon context and individual, rather that the sign or the text, is critical to our development of constructs of 21st century literacy. Broadening the understanding of signs and questioning our instruction in terms of learners and contexts can inform the teacher educator's construct of literacy for 21st century education.

Codes

A 21st century view of literacy opens the notion of text to "objects, actions, or events that can be created and interpreted" (Narey, 2017, p. 3). Literacy, therefore, is grounded in the phenomena of contextual experience. Celebrated linguist and literary theorist, Roman Jakobson (1960) argued that signs only make sense within the framework of a code. "Codes help to simplify phenomena in order to make it easier to communicate experiences" (p. Chandler, 2002, p. 157). In our current digital world, the term "code" is typically associated with computer programming, yet as anthropologist Edmund Leach (1976) notes, codes exist in all aspects of our lives from our clothing to our living spaces. Leach posits

> All the various non-verbal dimensions of culture, such as styles in cooking, village lay-out, architecture, furniture, food, cooking, music, physical gesture, postural attitudes and so on are organised in patterned sets so as to incorporate coded information in a manner analogous to the sounds and words and sentences of a natural language … It is just as meaningful to talk about the grammatical rules which govern the wearing of clothes as it is to talk about the grammatical rules which govern speech utterances. (Leach, 1976, p. 10)

One must have access to the code, must learn to understand that particular system of signs in order to make meaning. Semiotician Daniel Chandler (2002) notes, "We learn to read the world in terms of the codes and conventions which are dominant within the specific socio-cultural contexts and roles within which we are socialized" (p. 155).

Materiality and Embodiment

The terms, *materiality* and *embodiment*, have become prevalent in numerous articles published in professional journals over the last decades. Basically, these terms highlight the role of objects and of the human body in meaning making. For instance, a child's favorite stuffed animal, a doily crocheted by a beloved aunt, a popular song from our college days, or a spoonful of soup can evoke emotion and, therefore, as objects, carry individual human stories in their materiality: stories that we read, reinterpret, and recreate through these objects over time and context. Further, our human senses are the conduit to persons, places, and things and, thus, are the basis for making meaning: we read and write textures, scents, tastes, spaces. As Sadoski (2018) contends, regarding embodiment and literacy, "there are no abstract mental codes, structures, or processes that are divorced from sensory experience" (p. 66).

For example, a musty smell encountered in an antique shop provokes memories of playing in a grandmother's attic or a classroom space can dredge of feelings of discomfort for an adult recalling unhappy experiences with school.

Embodiment is evident beyond the association of sensory experience with memory. For instance, examples of embodiment in inquiry include renowned physicist Albert Einstein's thought experiments wherein his visualization of himself as photons traveling at the speed of light led him to develop his theory of relativity (Henriksen, Good, & Mishra, 2015) as well scientist, Temple Grandin's work with animal behavior and livestock management wherein her personal experiences with autism facilitated her visualization of alternatives to animal handling (Jacobson, 2012). A child who jumps out of his seat and rotates his body in a clockwise motion in response to a teacher's explanation of the earth's rotation also is example of embodiment in inquiry.

Explaining the emergence of embodied cognition as "putting the body back inside the mind," Johnson (1987) writes

> The embodiment of human meaning and understanding manifests itself over and over, in ways intimately connected to forms of imaginative structuring of experience…(This) does not involve romantic flights of fancy unfettered by, and transcending, our bodies; rather, they are forms of imagination that grow out of bodily experience, as it contributes to our understanding and guides our reasoning. (p. xiv).

Recent literacy studies have drawn on varied theoretical offshoots of materiality and embodiment. New materiality and embodiment theories reinforce the notion of multiplicity of texts and link to those multimodal and critical approaches that current print literacy instruction fails to address. For instance, drawing upon the work of physicist Karen Barad (2003, 2007) and early childhood literacy researchers such as Dyson (2003), Pahl and Rowsell (2011, 2014), and Wohlwend (2013), Jaye Johnson Theil (2015) explains, "New materialism is the philosophy and theory that all things in the world, including humans, are matter and that phenomenon and knowledge occur through continuous and varied material exchanges of both living and nonliving entities" (p. 114). From this perspective, she posits, humans and objects have the capacity to transform each other to co-construct experiences, and subsequently, literacies through these sustained, interdependent relationships, or what physicist, Karen Barad (2007) terms, intra-activity. Literacies are revealed in the texts created by the intra-actions among persons, places, and things. In other words, the person is not just a person, and a thing is not just a thing. Rather both are transformed through the phenomenon of the intra-action, through the process of the experience.

Pahl and Rowsell (2011) underscore that literacy is "artifactual" (p. 133) explaining that literacy takes material form through family artifacts or objects. These literacy education researchers emphasize the sensory qualities of materials, noting, "Artifacts are sensory… Artifacts smell, they can be felt, heard, listened to and looked at. Objects carry emotional resonance and they infuse stories. Paying attention to meaning through artifacts involves recognizing embodied understandings as responses" (Pahl & Rowsell, 2010, p. 10).

Following Bourdieu's (1991) notion of *habitus,* which may be described as the linking of the body to the social and cultural fields in which the body-as-text evolves, the embodied cognition movement gained popularity in the 1990s. Embodiment arose "largely as a rejection of theories based on abstract, amodal structures that could not account for growing behavioral and neuropsychological evidence" (Sadoski, 2018, p. 333). "Linguistic anthropology has long recognized the critical importance of the body-as-text" (Samuelson & Wohlwend, 2015, p. 566) and has become an important direction for 21st century literacy studies. As Thelen, Schöner, Christian, and Smith (2001) explains,

> To say that cognition is embodied means that it arises from bodily interactions with the world. From this point of view, cognition depends on the kinds of experiences that come from having a body with particular perceptual and motor capacities that are inseparably linked and that together form the matrix within which memory, emotion, language, and all other aspects of life are meshed. (p. 1)

Materiality and embodiment feature importantly in our construct of 21st century literacy.

Moving Forward to Sense-Making as a New Frame for Literacy

Calls for 21st century literacy are grounded in the need to prepare learners to deal with the challenges of technological, environmental, social, political, and cultural change. Therefore, to become literate is to achieve the capacity to make sense of our encounters within this diverse, complex, and rapidly changing world. Such a construct of literacy as sense-making is a creative process that can only be achieved by developing learners' knowledge of, and critical engagement with, the multiple sign systems that exist and are yet to be invented. Literacy as sense-making draws attention to the need to develop learners' creativity, aesthetic, and sensory-perceptual development.

As put forth in previous chapters in this volume, the widespread construct of "literacy as reading" that is focused only upon one facet (decoding) of a visual sign system representing sound-based verbal language (print texts) is not sufficient for 21st century demands. Nor, as I also have pointed out, has this narrow focus been adequate for learners throughout history. Yet, the characterization of literacy as reading/writing, as visual decoding/encoding of a singular sign system, dominates instruction in schools across the globe. This has led to a somewhat dichotomous view of this dominant portrayal in opposition to what I label "add-on" literacies (digital literacy, critical literacy, multimodal literacy) and results in the hierarchical positioning of these add-ons at the periphery of instruction.

While I continue to underscore that the intent of this volume is not to disregard the importance of reading/writing (print), I assert that viable constructs of 21st century literacy must abandon the notion of hierarchical positioning of any singular sign

system. Further, I argue that as teacher educators, we must seek to discover instruction that will support learners' literacy development across sign systems. Our notions of literacy must promote and support the previously identified skills required for sense-making in the 21st century: individual and collaborative creativity, visualization and abstract thinking, communicational fluency across media, and transdisciplinary approaches to conceptualizations of experience.

In the next chapter, I discuss a classic unit of analysis, the literacy event and explain how I have developed a new version. My new model of the literacy event offers a means of understanding literacy in a manner that no longer privileges print, but rather, affords it equal status across the multiple variables of a new 21st century formulation of literacy. It proposes a construct of literacy that can encourage promotion and support of skills required for sense-making in the 21st century.

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