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Relocating the 'Cognitive' in Sociocognitive Views of Second Language Learning

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This work began as a conversation between the two authors: one whose work in second language acquisition leans to the sociocognitive, and one whose orientation is cognitive science. It became clear through our initial conversations that these differing orientations to second language learning could be mutually informative if we persisted in constructive dialog. Thus our current effort to dialectically 'locate' the cognitive in the currently popular sociocognitive views of language and language acquisition.

Through conversation, our goal is for each of these two traditions to reap the benefits of the other and encourage the honing and fine tuning of language learning theory and practice when both traditions mutually inform. This quest for interdisciplinary cross-fertilization is not uncommon in an age where questions regarding human learning are indeed complexifying and the urgency for mutually informative inquiry across intellectual traditions is augmenting. In the field of language learning this need for collaboration between research traditions has become particularly imperative insofar as advances within both the cognitive and sociocognitive traditions tend to be on more divergent than convergent paths at this moment in history (Bialystok, 1998). Indeed, as Cobb and Bowers describe the current state, we are in the midst of the "second wave of the cognitive revolution" whereby lines between strictly cognitive and social concerns are rapidly blurring (1999; p. 5). There is recent movement away from what DeCorte et al (1996) term 'cold' cognition - from context-empty clinical views of mind - towards "hot" cognition that involve more "humanistically grounded methodologies and interpretive approaches" (p.491) How this may occur / be occurring in the field of second language studies is our current concern.

Sociocognitive Orientations

The term *sociocognitive* encompasses a broad range of current beliefs about learning in general, and language learning in particular. The term represents a growing attempt to reconcile the social and affective side of learning with what happens 'in the black box' as it were. Within the field of Linguistics, it is most closely aligned with Interactionist approaches to theory and research in language acquisition. It begins with the biological predispositions of the human mind for learning and language in consort with external reality (Larsen-Freeman & Long, 1991).

Within sociocognitive frameworks learners are seen as dialectically connected to social contexts in a synergistic, two-way relation. Mediating that relationship is the cognitive realm that is viewed as marshaling, routing, channeling, and generally guiding the interplay of the known and unknown; the implicit and the explicit. Meaning, in the sociocognitive sphere, is dynamic, never fixed. Its imperative is to capture and value the richness of this fluidity. Its central tenet - that learning and cognition are social, not autonomous acts - steers a great deal of current theory, research, and practice in language and literacy education. Its central questions and research approaches focus on the social, discursive, and affective side of the learning process; in the United States and Britain there is specific emphasis on multicultural personhood as playing a key, deterministic role in teaching and learning (Egan-Robertson, 1998; Walsh, 1990). That is, its position is that language, literacy, and learning are never socially nor politically neutral; these processes occur in and are guided by larger and local contextual features with which the individual interacts, transacts, and internalizes.

In language learning, major calls have come for increased emphasis on the “social nexus” of learning language (McGroarty, 1998: 596). Earl Stevik has long urged emphasis on the depth level of communicative processing with others. He has insisted that what ‘sticks’ when learning another language is that which gets negotiated with and expressed to others (Stevik, 1976). A growing number of studies that are founded on such sociocognitive views have been undertaken in the past decade. The focus of such work is on the social/physical and interpersonal dimensions of language learning environments that stimulate and support the acquisition of words and structures (e.g., Donato, 1994). Such research efforts have indeed begun to demonstrate specific processes and outcomes in second language acquisition that are tied to classroom negotiation structure (see Meskill, Mossop & Bates, 1999; Nystrand, 1997; Pica, 1998).

Cognitive Orientations

By contrast, the cognitive orientation to the study of learning and, by extension to language learning, has as its main imperative the quest for a ‘central processing unit’ that is the human mind. Its frameworks and activities center on building models of mind and explicating the ways in which the mind processes and internalizes an objective reality.

A key concern of cognitive psychology and cognitive sciences in general has been the serious consideration given to human learning. Several different theories have been developed to define the determinants of learning from a cognitive perspective (Bruner, 1957; Ausubel, 1962, 1963; Rumelhart & Norman 1978; Anderson, 1982; 1983; Kelly, 1991; Kolb, 1984; Bower and Hilgard, 1981). Although the different theoretical approaches emphasize different aspects of the multifaceted phenomenon of human learning, there is a unifying orientation that underlies all: that is, learning is a multisource phenomenon and new principles need to be forged to explain its highly interactive nature.

The cognitive orientation to learning has defined some of these new principles: e.g., learning is currently viewed as being active, constructive, cumulative, and goal oriented. There has been a shift away from the traditional focus on knowledge structures, and a strong emphasis on the mental processes for real-time coordination of diverse sources of learning. Emphasis now primarily lies with the crucial role of those cognitive processes and mental operations that are involved in constructing meaningful interpretations of learners’ experiences. Thus, efficient learning could not be accomplished without the active conscious involvement of the learner in the process: learners respond to events in accordance with how they perceive and interpret them (Kelly, 1991). Thus, they are seen as active and responsible participants rather than passive responders; they make choices based on reality as they perceive it (Kohonen, 1992). In this view, immediate personal experiences are seen as the focal point of learning, giving “life, texture, and subjective personal meaning to abstract concepts” (Kolb, 1984, p. 21).

Simple everyday experience, however, is not sufficient for learning to occur. The cognitive conceptions of learning emphasize that such experience must also be consciously observed and analyzed. Only experience that is reflected upon seriously will yield its full measure of learning, and reflection must, in turn, be followed by testing new hypotheses in order to obtain further experience (Sternberg, 1985). Thus, knowledge structures will not become part of the learner’s repertoire until they have been experienced meaningfully on a subjective level. Reflection plays an important role in this process by providing a bridge, as it were, between experience and knowledge construction. The process of learning is seen as the recycling of experience at deeper levels of understanding and interpretation (Kohonen, 1992). As such, both environmental factors and factors internal to the learner contribute to learning in an interactive manner.

An important aspect of reflection is the memory system. Memory and learning, however, are often presented as different concepts and the distinction between them is preserved in many ways in psychological and psycholinguistic research (Atkinson & Shiffrin, 1971). Yet, they are inextricably linked: in fact, they are the two sides of the same coin. Memories are left behind as a result of learning, and we infer the existence of learning from memories. If memory is considered an abstract term that describes mental states which carry information, learning will then describe the transition from one mental state to a second, in which the information is in some way different. An understanding of what mental operations secure the successful transfer of information will determine efficient learning.

Frames of Contrast

Both the cognitive and sociocognitive traditions attempt to integrate the complexities of the internal and external relationships of object and mind; sociocognitive with primacy on the interplay between context and mind; psychological on the primacy of mind. Nonetheless there are fundamental differences between the two orientations as is reflected in Table 1 below.

<u>Concerns:</u>	Goal of learning- 'knowledge'	Goal of learning- membership in discourse communities
	<u>Cognitive</u> in the mind	<u>Sociocognitive</u> in society
active, constructive process	in the mind	through experiential transactions with others
higher levels of processing involved	in the mind	through scaffolding, mentorship
prior knowledge (schemata)	abstract	as negotiated and expressed in communication with others
forms of representation in memory	what occurs in the mind	the anatomy of human interchange
task analysis	context free principals	context-dependent principals
instructional practices		

Table 1: Frames of Contrast

Cognitive and sociocognitive orientations each share key concerns regarding learning in general and language learning in particular. Where they differ is in the broad notion of mind where mind is either considered in autonomous relation with an objective reality, or as manifesting a socially constructed reality in consort with the environment. This conceptual difference obviously drives the types of questions and paths of research related to each

Because we began our conversations about these different orientations around the issue of word knowledge, it is this domain to which we will restrict discussion of divergences and potential convergences of the two orientations.

Words in a second language

The human drive for shared understandings of words evolves out of social necessity (Bickerton, 1981; Pinker & Bloom, 1992; Vygotsky, 1978). How these shared notions become integrated into the human mind has been the focus of work in both sociocognitive inquiry and cognitive science.

Word Knowledge: Sociocognitive Orientation

A word is a microcosm of human consciousness.

Lev Vygotsky, 1991

"Word meanings are dynamic rather than static formations" (Vygotsky, 1991:215). This is an important notion when considering vocabulary development in another language. Learners are typically expected to internalize a meaning associated with a given word through definitions and, in more recent times, a context of use. Activity and discourse in second language learning then, aim to evoke the *sense* of a word, not merely its representation. Vygotsky adapts the view of Paulhan who postulated that the *sense* of a word is very different from its *meaning*. According to Paulhan, the sense of a word is "the sum of all psychological events aroused in our consciousness by the word. It is a dynamic, fluid, complex whole, which has several zones of unequal stability. Meaning is only one of the zones of sense, the most stable and precise zone". Rather than being static, then, sense is a "complex, mobile, protean phenomenon; it changes in different minds and situations and is almost unlimited" (244-245). In the Vygotskian sphere of inner speech the senses of words cojoin into an "influx of sense". Word senses converge with earlier senses and are part of and ultimately influence change on the senses of later words. A sociocognitive view of second language learning, then, approaches lexical items not as a unitary link between word and thought, but as the *sense* that conflates and constructs through social, discursal activity. As such, word meanings constantly change with changes in thought and experiences. Thought, in turn, "undergoes many changes as it turns into speech" (Vygotsky, 219) and it is therefore through interaction with others (through the language of text or speech) that meanings get made, remade, rejected, and appropriated.

Bakhtin also proposes that meaning comes into existence when two or more voices come into contact: when the voice of a listener responds to the voice of a speaker. He contends that we don't learn words from dictionaries, but from other people's mouths or pens - these words being populated by multiple meanings of others. This is what Bakhtin calls *dialogicality*. A living word anticipates an answer. Understanding will occur only when there is response. Primacy, in this model, lies with the response. A word will have temporary *sense* when it breaks through the conceptual horizon of the listener and enters into the listener's conceptual system and aperceptive background. This background is populated by objects and emotions which affect interpretation. In terms of individual lexical items, differing responses and interpretations on the part of each human being - the distance between interpretations - is viewed as a factor of both local and larger cultures (Wells, 1992).

Sociocognitive frameworks see words - the *sense* of words - becoming conceptually and imagistically blended in the developing second language system, but that blending does not happen devoid of myriad influences beyond the words themselves and a single interlocutor's mind. Also considered in the sociocognitive framework is that the reproduction of words of others, but not necessarily the *sense*, is an essential component of the instructed second language acquisition process.

Word Knowledge: Cognitive Orientation

Words become integrated into a learner's conceptual system through strings of associations, or neural networks. The integration process itself is seen as a series of stimulus-response events whereby phenomena in the environment are assigned labels. These labels and their association with the object they describe become part of an associative web in the mind. This is known as the Network Approach to Memory.

The network approach to human memory has been found to be a powerful way to describe memory functioning (Norman & Rumelhart, 1975; Schank, 1972; 1988). In this approach, it is hypothesized that memory is arranged as a vast network, with individual ideas being the 'nodes' within the net with these nodes connected to each other via 'associative links' (Rumelhart & McClelland, 1986; Clark, 1991). When a node is activated, this activation energy spreads out to neighboring nodes, causing them to become activated. If neighboring nodes become activated to 'threshold' levels, this will initiate a response and cause activation to spread out from this new source.

Connectionism: Distributed Processing and Distributed Representations

In the newest version of network theory - Parallel Distributed Processing (PDP) - ideas and memory contents are represented not by a single node, but by *a pattern of activation* across a wide number of nodes (Rumelhart & McClelland, 1986). Processing is also distributed, with a large number of very simple operations being summed together to create inferences, associations, and decisions. Learning, in this view, is also a distributed process, with a large number of adjustments to 'connection weights' being the process underlying learning (Clark, 1991).

In a PDP system, contents are represented by widespread patterns of activation. The suggestion is that thinking about any one concept would correspond to the simultaneous activation of thousand of nodes. The specific combination of nodes, in fact, would uniquely correspond to (and thus represent) the particular concept or idea. These same nodes, in different combinations, will also be part of the patterns representing other contents. In other words, the activation of a particular node has no intrinsic meaning by itself; it is the pattern of activation that bears the meaning.

In the connectionist scheme, knowledge is literally contained within the connections themselves. What it means to know a word is to have a pattern of connections between the many nodes that together represent any one of the particular ideas or concepts that make up its meaning. Activation of any of the distributed representations will lead to the activation of the others. Knowledge, therefore, is not contained in the activation patterns themselves. Knowledge amounts to activation patterns being in a particular state of readiness (Clark, 1991).

Learning, within this framework, would be to find or create a connection, and this would mean to set up the pattern of the network (Clark, 1991; Schwartz & Reisberg, 1991). The connections within the network can be strong or weak. What it means to learn, therefore, is to adjust the various connection strengths so that activation will 'flow' in the right way. The process of learning is, therefore, a process of adjusting the strengths of connections, or, in the connectionists' jargon, of adjusting the connection weights. What it means to know something is, in these terms, to have the appropriate connection weights. The recency and frequency with which a particular pattern of connections has been activated will influence strongly the efficiency of learning. For one thing, the more often particular links between nodes are used, the stronger the links become. In a complementary fashion, activation is much more likely to spread along the routes of frequently traveled connections rather than along infrequently used paths.

In the connectionist explanation of the functioning of human memory, *working memory* comprises the *activated* portion of long-term memory and operates via *parallel processing*; spreading activation involves the simultaneous (parallel) activation (*priming*) of multiple links among *nodes* within the *network* (Clark, 1991; Schwartz & Reisberg, 1991).

In language learning one is not just learning a collection of unrelated items. Instead, the learning is leading to a whole network of new connections. In other words, in order for the learning process to be successful the ultimate aim would be to establish a greater number of connections among what is to be learned. The better connected the knowledge structure is, the more readily accessible in memory it will be.

Associations are not, however, passively stamped in; they are instead established by the learner's thinking about the items together. Good retention results from *elaborate processing*. In terms of the network, this form of processing aids memory by laying down retrieval paths from the context to the to-be-remembered items themselves. In essence, one is building new connections, or perhaps improving paths that already exist.

Convergences: Some Prospects for Mutually Informing Orientations

At the broadest level, existing convergences lie in the following:

- Both traditions are occupied with characterizing the intertwining of mind and its interactions with the world.
- Both traditions are concerned with the complexity of word meaning and acknowledge that this complexity is laden with historical and cultural luggage.

The chief desiderata that have emerged from our conversations is: 1) that cognition be viewed as it is embedded in complex social systems; and 2) that the study of meaning construction be informed by the large body of existing data on language and cognition.

At the level of word knowledge, the sociocognitive tradition may suggest that heretofore cognitive models of word knowledge - that is, networks of words and their associative links - should extend out from the autonomous individual mind to include those dialogic spaces where meaning is ultimately made through the use of language. The cognitive science tradition suggests that sociocognitively grounded research would benefit from the use of connectivity models as additional analytical lenses. This is especially promising when examining instances where language appears to be operating systematically and asystematically. Here inferences concerning predictable structures and patterns of associations can be formed through examination of the vast data derived from clinical experiments undertaken in the cognitive science tradition. Alerting sociocognitive researchers who are otherwise operating within context-based frameworks to the inferential potential such patterns and tendencies represent, how these theoretically mesh with short-term and long-term memory constructs, and how developing notions of mental schema are evident in human activity potentially informs their work.

Take the Anglicized French word *crepe* as an example. Given a random group of native English speakers, the word alone - devoid of any controlled context beyond a straight elicitation situation - evokes the sense of either a food item or a fabric. Probing for associative differences typically elicits visual, olfactory, tactile, or aural links tied to the reported recency and salience of thoughts or experiences. The *sense* of *crepe*, in other words, is evoked through some kind of mental association. In cognitive terms, the link between the stimulus *crepe* and an associated item in the world to which it is linked in the mind belies a structuring of words and their associates. Associated words that collocate with the word *crepe* are indicative of certain culturally induced patterns of association that extend from the mere phonetic to the conceptual in terms of the 'fit' of associated words that can and cannot co-occur with *crepe*.

In sociocognitive terms, the fact that two possible senses of the word *crepe* are possible in English, and that which sense is evoked is wholly dependent on time, place, and affective state brings the associative link outside of the autonomous mind and into the arena of socio/environmental interplay. Where these two conceptual realms seem to converge is in the nature of association - the one being 'in the head' could be extended to include those sociocognitively conceived considerations of context and affect - both of which may, in this convergent extension, be assisting the other: the cognitive providing the physiologically conceived link, the sociocognitive serving to 'oil the connections' by virtue of affective and contextual pungency.

We believe that cognitive orientations have the potential help to fill in gaps and round out issues in sociocognitive enterprises as related to second language learning. Clinical experiments that illustrate certain architectures and tendencies of mind can and ought to be incorporated into sociocognitive theory and practices. Such established lenses can be used to gain additional perspective on learning phenomena *in situ*. Likewise, sociocognitive views need to be factored into cognition-based research. Issues of context, affect, and personhood can greatly inform research design and interpretation. In sum, we feel these potential convergences are valuable and perhaps worthy of further conversation.

Final Remarks

Both the cognitive and sociocognitive traditions attempt to integrate the complexities of the internal and external relationships of object and mind; sociocognitive with primacy on the interplay between context and mind; psychological on the primacy of mind. Combining the inferential methods and assumptions of both traditions - one concerning neurophysiological functioning in the mind, the other with socially construed understandings of these same processes - can certainly aid in addressing the shortcomings of both orientations: one being exclusionarily scientific, the other often accused of lacking scientific rigor. Where differences in orientations in the 'soft' and 'hard' sciences have more frequently been pitted one against the other in paradigm wars, terminological battles, and the wrestling of ideologies, we suggest that through the convergence of these respective stances new metaphors can emerge.

References

- Anderson, J. (1982) Acquisition of Cognitive Skill. In: Psychological Review, 89, 369-406.
- Anderson, J. (1983) The Architecture of Cognition. Cambridge, MA: Harvard University Press.
- Atkinson, R. and Shiffrin, R. (1968) Human Memory: A Proposed System and Its Control Processes. In: K. Spence; J. Spence (eds), The Psychology of Learning and Motivation: Volume 2. Advances in Research and Theory. New York: Academic Press.
- Ausubel, D. (1962) A Subsumption Theory of Meaningful Verbal Learning and Retention. In: Journal of General Psychology, 66, 213-224.
- Ausubel, D. (1963) The Psychology of Meaningful Verbal Learning. New York: Grune & Stratton.
- Ausubel, D. (1968) Educational Psychology: A Cognitive View. New York, NY: Holt, Rinehart and Winston.
- Baddeley, A. (1990) Human Memory. Hove, England: Erlbaum.
- Bakhtin, M. (1981) The Dialogic Imagination. in M. Holoquist (Ed) Four Essays by M.M. Bakhtin Austin, TX: U of Texas Press.
- Bialystok, E. (1998) Coming of Age in Applied Linguistics. Language Learning, 48. 4, 497-518.
- Bickerton, D. (1981) The Roots of Language. Ann Arbor, MI: Karoma Press.
- Cobb, P. and Bowers, J. (1999) Cognitive and Situated Learning Perspectives in Theory and Practice. Educational Researcher, 28, 2.
- DeCorte, E., Green, B., & Verschaeffel, L. (1996) Mathematics Learning and Teaching. In D. Berliner and R. Calfee (Eds.) Handbook of Educational Psychology (491-549) New York: Macmillan.
- Donato, R. (1994) Collective Scaffolding in Second Language Learning. In J. Lantolf & G. Appel (Eds.) Vygotskian Approaches to Second Language Research (33-56) Norwood, NJ: Ablex.
- Egan-Robertson, A. (1998) Learning about Culture, Language and Power: Understanding Relationships among Personhood, Literacy Practices, and Intertextuality. Albany, NY: National Research Center on English Learning and Achievement.
- Engle, R. (1994) Individual Differences in Memory and their Implications for Learning. In R. J. Sternberg (ed.), Encyclopedia of Intelligence, New York: Macmillan, 700-704.

- Kelly, G. (1991) The Psychology of Personal Constructs. A theory of Personality. London: Routedledge.
- Kohonen, V. (1992) Experiential Language Learning. In: D. Nunan (ed.). Collaborative Language Learning and Teaching. Cambridge: Cambridge University Press.
- Kolb, D. (1984) Experiential Learning. Experience as the Source of Learning and Development. Englewood Cliffs: Prentice Hall.
- Larsen-Freeman, D. and Long, M. (1991) An Introduction to Second Language Acquisition Research. London: Longman.
- McGroarty, M. (1998) Constructive and Constructivist Challenges for Applied Linguistics. Language Learning, 48. 4, 591-622.
- Meskill, C., Mossop, J. and Bates, R. (1999) Electronic Text and English as a Second Language Environments. Albany, NY: National Research Center on English Learning and Achievement.
- Norman, D. and Rumelhart, D. (1975) Explorations in Cognition. San Francisco: Freeman.
- Nystrand, M. (1997) Opening Dialogue: Understanding the Dynamics of Language and Learning in the English Classroom. New York: Teachers College Press
- Pica, T. (1998) Second Language Learning through Interaction: Multiple Perspectives. In V. Regan (Ed.) Contemporary Approaches to Second Language Acquisition in Social Context. Dublin: University of Dublin Press.
- Pinker, S. and Bloom, P. (1992) Natural Language and Natural Selection. In J. Barkow, L. Cosmides, and J. Tooby (Eds) The Adapted Mind: Evolutionary Psychology and the Generation of Culture. New York: Oxford University Press. P. 451-493.
- Rumelhart, D. and McClelland, J. (1986) Parallel Distributed Processing. Volume 1. Cambridge, MA: MIT Press.
- Rumelhart, D, and Norman, D. (1978) Accretion, Tuning, and Restructuring: Three Models of Learning. In: J. Cotton; R. Klatzky (eds), Semantic Factors in Cognition. Hillsdale, NJ: Lawrence Erlbaum.
- Schank, R. (1984) The Cognitive Computer: On Language, Learning and Artificial Intelligence. Reading, MA: Addison Wesley.
- Schwartz, B. and Reisberg, D. (1991) Learning and Memory. New York: W. W. Norton & Company, Inc.
- Sternberg, R. (1985) Mechanisms of Cognitive Development: A Componential Approach. In: R. Sternberg (ed.), Mechanisms of Cognitive Development. New York: W. E. Freeman.
- Sternberg, R. (1996) Cognitive Psychology. New York, NY: Holt, Rinehart and Winston, Inc.
- Stevik, E. (1976) Memory, Meaning & Method: Some Psychological Perspectives on Language Learning. Rowley, MA: Newbury House.
- Vygotsky, L. (1978) Mind and Society. Cambridge, MA: Harvard University Press.
- Vygotsky, L. (1991) Thought and Language . Cambridge, MA: MIT Press_
- Walsh, C. (1990) Pedagogy and the Struggle for Voice: Issues of Language, Power, and Schooling for Puerto Ricans. NY: Bergin & Garvey.

Wells, G. (1992) The Centrality of Talk in Education. In K. Norman (Ed) Thinking Voices: The Work of the National Oracy Project. London: Hodder & Stoughton.