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SOCIOCULTURAL THEORY AND L2

State of the Art

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This article considers the implications of two central constructs of sociocultural theory (SCT) for second language (L2) development: mediation and internalization. It first discusses Vygotsky's general theoretical claim that human mental activity arises as a consequence of the functional system formed by our biologically specified mental capacities and our culturally constructed symbolic artifacts. It then examines some of the L2 research that has investigated the extent to which L2 users are able to deploy their new language for cognitive mediation. Specific attention is given to the mediational function of L2 private speech and to the synchronization of gestures and speech from the perspective of Slobin's thinking for speaking framework, a framework that interfaces quite well with Vygotsky's theory. The second general topic addressed, internalization, is intimately connected to the first. It is argued that internalization of the features of a L2 takes place through imitation, especially as occurs in private speech. Imitation, based on recent neuroscience and child development research, is seen as an intentional and potentially transformative process rather than as rote mimicking. The research documents that L2 children and adults rely on imitation in their private speech when they encounter new linguistic affordances. What remains to be established is the connection between the linguistic features of private speech and those deployed by L2 speakers in their social performance. Finally, the article proposes that the study of how L2 learners internalize and develop the capacity to use conceptual and associated linguistic knowledge should move to the forefront of SCT L2 research and argues that a productive way of realizing this agenda is through the union of SCT and cognitive linguistics.

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In the mid-1980s, Frawley and Lantolf began to explore the potential relevance of sociocultural theory (SCT) for second language (L2) acquisition and use. In particular, in our early work (Frawley & Lantolf, 1985; Lantolf & Frawley, 1984), we were interested in how L2 speakers used their new language to mediate themselves in the face of difficult tasks. Since that time, a great deal of research that is directly or indirectly informed by SCT has been carried out on L2 development. The work includes two edited volumes (Lantolf, 2000b; Lantolf & Appel, 1994) and a special issue of *The Modern Language Journal* (Lantolf, 1994), as well as numerous journal articles, chapters in edited volumes, and doctoral dissertations. Several handbooks and edited volumes in applied linguistics and SLA have included SCT contributions (e.g., DiCamilla, Antón, & Lantolf, 2003; Lantolf, 2001, 2004a, 2004b, in press). Lantolf and Thorne (2005) have recently completed a book-length study on SCT and L2 development. Additionally, general SLA publications (e.g., Ellis, 1997, 2003; Mitchell & Myles, 1998) have included significant portions on SCT research. Swain, along with her colleagues and students, has also integrated several of the core concepts of the theory—in particular, the mediational function of speaking—into her well-known pushed output model of SLA (Swain, 2000, 2001; Swain & Lapkin, 1998, 2001, 2002; Swain, Brooks, & Tocalli-Beller, 2002).

My intent in the present article is not to review all of the SCT research on SLA carried out over the past 20 years. Two fairly comprehensive reviews of this research have already appeared (Lantolf, 2000a; Lantolf & Pavlenko, 1995). Instead, I concentrate on two areas that I believe are particularly important, especially with regard to future research: L2 mediation and the internalization of L2s. I do not, however, mean to imply that these are the only fruitful areas of research in SCT. For instance, promising SCT research has recently emerged that builds upon the principles of the theory and extends them to L2 instruction (see Ferreira, 2005; Lantolf & Poehner, 2004; Negueruela, 2003; Negueruela & Lantolf, in press; Poehner, 2005; Poehner & Lantolf, 2005).

Before proceeding, it is necessary to address a few remarks to the meaning of the term *sociocultural*. When Frawley and I began our SCT work, the term *sociocultural theory* (commonly used in the general educational and psychological literatures at the time) was unproblematically construed to refer to the theory of mental development and functioning formulated by Vygotsky and his colleagues (Frawley & Lantolf, 1985). Since that time, however, some working in the theory, such as Cole (1996) and Ratner (2002), have proposed that Vygotsky's theory should be referred to as cultural psychology or cultural-historical psychology. Others, such as Engeström (1999), have integrated Vygotsky's theory with activity theory, inaugurated by Vygotsky's colleague, A. N. Leontiev; these authors refer to the new theory as cultural-historical activity theory. In this article, I will use the term familiar to L2 researchers: SCT. Within the L2 literature, social constructionist researchers—including, among others, Norton (2000) and Hall (1997)—have also appropriated the term to refer not to Vygotsky's theory but to a broad set of theoretical frameworks

that focus on social and cultural factors in L2 learning and use.¹ The ensuing discussion construes SCT as it relates to Vygotsky's theory only.

MEDIATION

Ratner (2002) defines SCT (or, in his terminology, cultural psychology) as the field that “studies the content, mode of operation, and interrelationships of psychological phenomena that are socially constructed and shared, and are rooted in other social artifacts” (p. 9). Accordingly, human psychological processes are organized by three fundamental cultural factors: activities (e.g., play, education, work, legal and medical systems, esthetic creation), artifacts (e.g., use of physical tools, books, weapons, eating utensils, clocks, computers, and related technology as well as symbolic tools, including language, numeric systems, diagrams, charts, music, and art), and concepts (the understandings that communities construct of the personal, the physical, the social and mental worlds, religion, etc.). For analytical reasons, it might be desirable to examine the three factors independently; however, in normal human behavior, it is clear that they generally function as an integrated organic system. Thus, for example, education (a leading activity of many cultures) incorporates both physical and symbolic artifacts, including books, paper, pencils, computers, language, numbers, diagrams, and so forth, and has the goal of helping students develop coherent concept-based knowledge of the world.

Once appropriated, these cultural factors mediate the relationships between people, between people and the physical world, and between people and their inner mental worlds. Humans in all of their manifestations are organized in accordance with the various activities, artifacts, and concepts that they jointly construct through history. Said another way, humans are not conceived of as autonomous thinkers and actors, but as functional systems, or what Wertsch (1998)—recalling Bateson's (1972) well-known example of a blind individual using a cane—refers to as persons-acting-with-mediational-means.

In essence, Vygotsky proposed a new ontological understanding of humans as mediated beings and in this way resolved the long-standing Cartesian mind-body dualism, which had been dealt with through “either-or thinking” (Valsiner & van der Veer, 2000, p. 6)—that is, either through downward reductionism that explains mental processes in terms of biological endowments or through upward reductionism that explains the same processes as derived from the social-discursive environment (Valsiner & van der Veer). Vygotsky's proposal recognized the fundamental contribution of biological as well as social and cultural factors, but his solution was not predicated on a recipe approach that called for a pinch of nature and a pinch of nurture. Rather, he argued that our biologically determined mental systems—including memory, attention, and reflexes—which in other species operate automatically as a consequence of direct stimulation from the environment or from internal bodily needs (e.g., hunger and thirst), are reorganized into a new, uniquely human psychological

system once humans encounter cultural artifacts, activities, and concepts (for convenience, I will use artifact to represent all three notions). These artifacts empower humans with the capacity to mediate and thus intentionally control their biologically endowed mental functions (Vygotsky, 1978, 1987). This means that humans are able to inhibit automatic reactions to stimuli. This is accomplished, for example, when individuals tell themselves not to act until they have developed a reasoned plan of action and then, through the use of cultural artifacts, they construct (on the ideal plane) a plan of action that will allow them to consider consequences of their actions before they instantiate them in real time. This ability enabled the human species to avoid potentially dangerous situations toward which their automatic biological functions might otherwise have impelled them. Arieviditch and van der Veer (2004) captured this central point in the following commentary:

Without mental regulation, a living organism is limited only to perpetuate “the previous experience” of action, that is, to perform routine, standard activities. This can suffice in standard conditions, but if the situation suddenly changes, this way of acting (an automatic reaction) can hardly lead to success. In contrast, with the emergence of mental control, the adaptive ability of the organism increases dramatically. (p. 161)

In sum, Vygotsky proposed that, in humans, biological and cultural factors form a dialectically organized mental system in which biology provides the necessary functions and culture empowers humans to intentionally regulate these functions “from the outside” (Vygotsky, 1997, p. 55).² Vygotsky stated this argument in a very compelling way:

I only want to say . . . that without man (= operator) as a whole the activity of his apparatus (brain) cannot be explained, that man controls his brain and not the brain the man . . . , that without man his behavior cannot be explained. (as cited in Yaroshevsky, 1989, p. 230)

Bruner (1966) proposed that activities, artifacts, and concepts function as cultural amplifiers and suggested that as with physical tools (hammers amplify our strength and sticks amplify our reach) symbolic artifacts (e.g., literacy) amplify memory and increase our capacity to organize and communicate knowledge. R. Scollon (2001) pointed out, however, that although tools and artifacts enhance our abilities, they can also “reduce and constrain them in other ways” (p. 117). Thus, although a stick increases my reach and thus allows me to knock a piece of fruit from a tree, I cannot know through the stick if the fruit is ripe and should be knocked from the tree. Similarly, having internalized the English conceptual metaphor ARGUMENT IS WAR makes it difficult, and perhaps impossible (although this is an open question and, I suggest, an important topic for future research), for me to conceive of the same event through the Chinese metaphor ARGUMENT IS A DANCE (see S. Scollon, 1993).

To study the culturally organized human mental system, Vygotsky (1978) proposed a new research methodology: the genetic method. Briefly stated, the genetic method focuses on the history or formation of the system rather

than on its fully formed and smoothly functioning version as represented in the adult mind. For this reason, Vygotsky was intently interested in the study of children as they struggled to gain control over the mediational means of their communities. He referred to his research as genetic experiments, in which he set difficult tasks for children to carry out but offered them some form of mediation and observed if and how they made use of this external support to regulate their activity. Luria, one of Vygotsky's most influential colleagues, conducted genetic experiments to uncover the process through which children acquired the capacity to use language—the most powerful of our mediational artifacts—to regulate themselves in the face of complex tasks (Luria, 1982).

Vygotsky, Luria, and others realized that it was also possible to observe how the mind functioned through the study of the mental system when it was not operating smoothly. This might be observed, for example, when adults are presented with difficult or unusual tasks that bring out their inner order through talk (and, we will see later, gesture), or when the system unravels in pathological circumstances, as in the case of brain injury or disease (Luria, 1973), or when a community is confronted with a new artifact or form of activity, such as when formal education was introduced into the rural communities of several of the republics of the former Soviet Union (Luria, 1976; Tulviste, 1991). Another site for observing the system in its formation (or perhaps better stated, reformation) is in L2 development, a topic to which I now turn.

L2 Development and Mediation

One of the most intriguing questions addressed by SCT research on L2 development is whether individuals who learn a new language as late adolescents or adults can deploy this language to mediate their psychological activity. Based on a series of studies with Russian native language (L1) speakers learning L2s in tutored and experimental settings, Ushakova (1994) argued that although L2 speakers can use their new language for social communication, they cannot use it as a psychological artifact to mediate their thinking. According to Ushakova, the “second language is incorporated into the classification system already available in the first language, relies on the previously developed semantic system [L1 inner speech], and actively employs first language phonology” (p. 154). The early research of Lantolf and Frawley (1984), Frawley and Lantolf (1985), Ahmed (1994), Appel and Lantolf (1994), and McCafferty (1994), however, does not support Ushakova's position. This research showed that when encountering difficulties in narrating a picture story (e.g., relating the events in proper sequence), recalling a fairy tale (e.g., remembering not to reveal the twist in the story too soon), or explaining the content of an expository text (e.g., making sense of complex instructions), English as a second language (ESL) learners externalized their private speech exclusively in the L2 in order to mediate and organize their thinking. One of the potentially important differences between Ushakova's research and that carried out by North American scholars is that the former was conducted in a foreign language con-

text, whereas the latter was instantiated in an immersion L2 setting. Thus, the material circumstances of a task, including the language in which it is posed as well as the language of the community in which it is carried out, could influence which language a speaker accesses for self-regulation.

The research of Centeno-Cortés and Jiménez-Jiménez (2004), which involved L1 and L2 speakers of both Spanish and English, clarified the problem to some extent. The participants in their study comprised three groups: six L2 speakers of Spanish as a foreign language (L1 English) at the intermediate level (fourth-semester university conversation course), six advanced level L2 speakers (teaching assistants in a Spanish graduate program at the same university), and six L1 speakers of Spanish (also proficient in English) living in the United States—most of whom were also teaching assistants in the same graduate program. The participants were presented with a series of 15 cognitively challenging problems that focused on math, logic, spatial manipulation, and kinship, as illustrated in (1) and (2).

- (1) *A man and a boy who are walking together step out with their right foot first. The boy walks three paces while the man walks two. When will they both put their left foot forward together? Explain.*
- (2) *Carlos bought a used car for \$600 and sold it to Pedro for \$800. He later bought it back for \$1000 and resold it for \$1200. Did Carlos make any profit and, if so, how much? Explain.*

The instructions and the problems were presented sequentially in Spanish to all participants, via a computer. The participants were asked to type their responses. They were given no instructions with regard to which language, if any, to use to solve the problems or in producing private speech.³ Each participant wore a stereo microphone attached to a mini-disk recorder to capture any private speech they might produce as they attempted to solve the problems.⁴

The Spanish L1 speakers produced only two brief private speech utterances in their L2: “oops,” produced in response to a typing error, and “what?” generated by a participant when reading a problem. All of their other private speech surfaced in their L1. Compared to the earlier studies on L2 private speech already cited, this suggests that the material circumstances of a particular task (in this case, the task language) influence which language an individual is likely to access for cognitive regulation. At first glance, it appears that the Spanish L2 speakers lend some additional support to this possibility. The intermediate group produced 35% of their private speech utterances in Spanish and the advanced group externalized 52% of their self-directed talk in their L2. However, when we look more closely at the specific functions of the L2 among the English L1 speakers in the Centeno-Cortés and Jiménez-Jiménez (2004) study, things change.

Use of the L2 among the intermediate speakers entailed reading the problem aloud in the original language, Spanish. This can, of course, serve to clarify the task, and even L1 speakers read aloud if the task is sufficiently complex

(see Appel & Lantolf, 1994; Roebuck, 1998). However, after reading a problem in the L2, virtually all of the intermediate speakers switched to their L1 to work their way through the solution. One intermediate speaker even produced a self-directive in Spanish—*bueno entonces* “good then”—as if he were about to launch into the solution in Spanish, but he immediately switched to English. Frawley (1997) argued that private speech serves cognition by bringing into focus those features that the person sees as relevant to a particular problem. The intermediate speakers relied heavily on their L1 for this crucial regulatory strategy. Thus, in trying to solve a spatial position problem, one speaker said: “West AT [heavy stress] the sun. Not of the sun. West AT the sun. West at the sun” (Centeno-Cortés & Jiménez-Jiménez, 2004, p. 26).

The advanced L2 speakers also read the problem aloud in Spanish. As might be expected, speakers in this group were more likely to be able to sustain some spontaneous private speech in the L2 as they worked through the problem. What is interesting with regard to the advanced speakers of Spanish, however, is that if they were able to sustain L2 private speech, they were unsuccessful at reaching a solution. They were only able to reach correct solutions when they either switched into English or conducted the entire process through their L1. The example in (3) illustrates a speaker who sustained her private speech in the L2 when attempting to solve a spatial problem about turning a glove inside out and switching hands. She was unsuccessful at solving the problem.

- (3) *Me lo quito. . . [she makes some noise with her mouth]. . . bueno eso no importa . . . ¡depende! ¡Depende de cómo tienes la mano! El guan' la mano derecha . . . dándolo la vuelta . . . ¡depende! . . . es que. . . Ok! ¡A ver! ¡No-no-no-no- es tan fácil usar esto! [noises with her mouth] [laughs] No, ¡no sé! . . . y si quita la palma hacia arriba. . . das la vuelta. . . palmo hacia abajo. . . ¡ehhh! ¡Oh! ¡No lo sé!*
 “I take it off . . . [noise with her mouth] . . . good this doesn't matter . . . it depends! It depends on how you have your hand! The glov' the right hand . . . turning it . . . it depends! It's . . . Ok! Let's see! It is not-not-not-not- so easy to use this! [noises with her mouth] [laughs] No, I don't know! . . . and if removes the palm upward . . . you turn it . . . palm down . . . ahhhh! Oh! I don't know!”
 (Centeno-Cortés & Jiménez-Jiménez, 2004, pp. 23–24)

In (4), the speaker was working to solve a version of the well-known puzzle of a farmer transporting a cabbage, a goat, and a wolf across a stream using a boat that is only large enough to carry the farmer and one of piece of cargo at a time. The speaker was unable to sustain private speech in the L2, switched to the L1, and, ultimately, solved the puzzle.

- (4) Ok! *Los hijos . . . uno queda . . . uno va pa'. . . [sigh]*
 “the children . . . one remains . . . one goes to[ward]. . .”
 so . . . one gets back to get the parent . . . and she goes . . . eh? Where? [laugh]
El otro. . .
 “The other . . .”
 Ok! . . . [sighs] Ok! So! the two go over. . . one brings the boat back. . . gives it to the mother. . . she goes over. . . ok! And he goes back. . .
 (Centeno-Cortés & Jiménez-Jiménez, 2004, p. 23)

To determine what might be going on, it is important not to lose sight of Vygotsky's (1987) fundamental argument that it is the meaning of the sign, rather than its externalized formal properties, that is key to self-regulation. There are three points to be made in this regard. First, externalizing private speech in any language is not a guarantee that a successful solution to a problem will be achieved. Indeed, the two best problem-solvers in the study under discussion were a L1 Spanish speaker, who produced the greatest frequency of private speech, and an intermediate L2 speaker, who failed to externalize any private speech at all.⁵ Second, as I will discuss in more detail later, deploying the formal features of an L2 is not the same as deploying L2 meanings. Third, for those participants who sustained L2 private speech but were unsuccessful at solving the relevant problem, it is quite likely that this activity itself required that they focus a good deal of cognitive effort on generating self-directed speech in the L2; in a sense, producing Spanish became an intentional subgoal of talk and, therefore, the language was unable to fully serve its function as a problem-solving tool. Some support for this possibility comes from a study by Swain and Lapkin (1998) on French immersion learners. The researchers included sample dialogues in which learners who collaborated on reconstructing a story based on a dictogloss task exhibited control over grammatical and lexical features of French produced in socially oriented speech; however, when the same speakers engaged in group problem-solving activities—which would have called for use of the same L2 features—they switched to their L1, English (e.g., “How do you say follow?”; p. 330). Moreover, they used their L1 to confirm or negate lexical choices (e.g., “*Sort*, yeah,” “*Se sort?*” “No, *sort*”; p. 332).⁶ The fact that speakers can use a L2 socially does not mean that they can use it to regulate cognitive activity because although it is derived from social speech, the psychological function of speech takes time for appropriate experiences to develop.

To conclude this portion of the discussion, the research carried out so far indicates that the language of a task influences—although certainly does not fully determine—the language that speakers access to control their thinking in the task. However, L2 speakers appear to have problems sustaining L2 private speech and reaching a successful task outcome. This is most likely because of the psychological status of the L2: Although it might be used for fluent and proficient social speech, the L2 (at least in the studies conducted to date) seems to take up a sufficient amount of a speaker's attention so that it cannot fully serve to mediate cognition. One of the shortcomings of the existing research is that none of the studies to date established conditions whereby the same speakers are intentionally encouraged to use their L1 and their L2 in separate tasks. To answer the question of L2 mediation of mental activity with confidence, procedures must be incorporated into future research that promote this possibility.

An equally important direction for future research is the investigation of the meanings deployed by speakers as they use L2 private speech. The ability to use a language to mediate mental activity, according to Vygotsky, depends

not just on form and simple referential meaning but also on appropriate use of features such as focus particles and conceptual meaning. Frawley (1997) pointed out that languages make available to their speakers inventories of linguistic devices that can be used to focus mental activity. Although these forms emerge in social speech, they are appropriated by speakers, as Vygotsky argued, for speech directed at the self. English, for example, includes such features as “now,” “next,” “let’s see,” “oh,” “OK,” and so forth that speakers frequently use in their private speech. The ability of L2 speakers to use focus features appropriately in their private speech is another important area for future research on L2 mediation; related to this is the extent to which L2 speakers use other features of the language appropriately. This requires careful comparison of the private speech of L1 speakers with that produced by L2 users of the language. So far, only two studies (Appel & Lantolf, 1994; Frawley & Lantolf, 1985) have carried out such comparative research, but neither of these studies focused specifically on the meanings externalized by the participants. In their study, Centeno-Cortés and Jiménez-Jiménez (2004) compared L1 and L2 performance on quantitative measures only and therefore failed to provide any crucial evidence on the nature of the meanings deployed by the speakers. If we consider the excerpt from their study given in (3), the Spanish utterances produced by the speaker appear to be very English-like. For instance, the utterance *Depende de como tienes la mano* “it depends on how you have your hand,” although grammatical—and indeed a possibility that could be used in social speech—does not seem to this author (an experienced L2 speaker of Spanish) like something that a L1 user of the language would say under the same circumstances. However, until the necessary research is carried out, this is only speculation.

Meaning and L2 Mediation

In this subsection, I will discuss research on L2 mediation in which meaning plays a central role in the mediation process. I will first consider the importance of gesture as it interfaces with speech; then I will consider the relevance of conceptual metaphors.

Gesture and Mediation. One of the most exciting new areas of SCT L2 research deals with the appropriation and use of gestures as a form of mediation. There are two general areas of interest here: the extent to which L2 learners are able to appropriate gestures that are specific to particular cultures (McCafferty, 1998, 2002; McCafferty & Ahmed, 2000) and the interface between speech and gesture as it relates to Slobin’s (1996, 2000, 2003) thinking for speaking (TFS) hypothesis. It is the second area that I want to address because it is more directly relevant to the matter of L2 self-regulation.

McCafferty (2004) argued that there is a close connection between speech and gesture that goes beyond social communication. Gesture can contribute to the development of thinking and, as such, can “function as a separate, spatio-

motoric mode of thinking” (p. 149). Indeed, recalling Vygotsky’s (1987) observation that speech is at first “a conventional substitute for the gesture” (p. 98) in child development, McCafferty noted that “the overall movement towards semiotic mediation starts with gesture in the form of pointing, a way by which we not only come to indicate but to know objects and the world around us” (p. 149). Vygotsky (1978) perceived a close connection between gesture and symbolic play in children. When they begin to draw, for instance, children often indicate what their drawings represent through gesture; for example, a child makes a horizontal motion with her hand to indicate that the bottom of the page represents the earth or pretends that a stick is a baby and makes gestures that symbolically show that holding and feeding a baby apply to the stick (Vygotsky, 1978, p. 108).⁷

In popular usage, *gesture* is generally understood as manual movements that frequently occur in the absence of speech, such as when someone waves to indicate leave-taking or—in the Anglo world—when someone rotates the index finger near the temple to indicate that someone is crazy. These behaviors, however, represent only one type of gesture, which McNeill (1992) called emblems, or gestures whose meaning can be interpreted independently of speech. Another popular understanding of gesture includes pantomime, in which the entire body might be used to express meaning. My concern, however, is with gestures that co-occur with speech, especially iconics, metaphors, and beats. Iconic gestures are, as the term implies, most often—although not always or exclusively—hand gestures (at times the entire body can be involved, as when indicating the bumpy nature of a bike ride over cobblestones) that represent physical objects or actions, such as containers, balls, drainpipes, and the like. They occur in conversations when a speaker describes an object or event, and they frequently imagistically impart information encoded partially, or not at all, in speech (McNeill). Thus, a speaker might produce a verbal utterance such as “The bird flew out of the nest” but might indicate the direction of the flight (upward, downward, etc.) through hand movements.

Metaphoric gestures are similar to iconics except that their referent is an abstraction (for instance, when a speaker holds both hands out in front of the body separated by about a foot with palms facing each other and says “I feel completely closed in”). The distance between the hands and the tension expressed in their movement might be a better indicator of how intensely the speaker experiences the condition than can be expressed completely through the qualifier. Beats, which resemble someone beating musical time, entail hand movements that can be rather obvious or quite subtle, involving no more than a “flick of the hand or fingers up and down, or back and forth” (McNeill, 1992, p. 15). The importance of beats resides in their semiotic value as markers of the significance of the stretches of speech with which they synchronize—for instance, when a speaker introduces a new topic into a conversation or a new character into a story (McNeill). McCafferty (1998) reported that one L2 speaker in his study produced a beat on each word of an utterance, as if monitoring

word production: “*they might, they might have steal, stole, they might have steal, stole*” (p. 83). According to McCafferty, the beats indicated embodied attempts to maintain focus on the form of the utterance (i.e., regulate) as the speaker externally worked out the appropriate verb form to convey his intended meaning. Thus, the beats might be imagistic correlates of spoken focus particles and phrases (e.g., no, yeah, ok, let’s see).

According to McNeill (2000), speech and gesture form a unit of thinking that he called growth point (GP), a notion closely connected to Vygotsky’s concept of inner speech. The GP of an utterance combines “two distinct semiotic architectures”—one verbal and one imagistic—into a single meaning system. Importantly, because each component of the GP possesses “unique semiotic properties,” each can surpass “the meaning possibilities of the other” (McNeill & Duncan, 2000, p. 144). Paraphrasing Vygotsky, McNeill and Duncan suggested that gestures are “*material carriers of thinking*” (p. 155) and therefore provide “an enhanced window into mental processes” (p. 144).

Gesture and thinking for speaking. McNeill and his colleagues have pioneered research on the relationship between speaking and gesture, based on Slobin’s neo-Whorfian TFS hypothesis. Slobin (1996) proposed that in the activity of speaking, thinking takes on a particular quality as experiences are filtered through languages into verbalized events. He suggested that TFS might not merely influence how people talk about events but, more important, how they experience those events that “they are likely to talk about later” (Slobin, 2003, p. 179). Slobin called this the anticipatory effects of language, which arise during experience time; as the “prelinguistic or nonlinguistic coding” takes place during experience time, the person attends “to those event dimensions that are relevant for linguistic coding” at speaking time (Slobin, 2003, p. 179). It is during speaking time that TFS comes into play, and the person attends to, and accesses, “the linguistically codable dimensions” of the event (Slobin, 2003, p. 179). Clearly, Slobin’s theorizing on the relationship between speaking and thinking is commensurate with Vygotsky’s, who argued that speaking completes the thinking process.

Thinking for speaking is a particularly compelling area of L2 research with regard to L2 meaning and self-regulation. McNeill’s research, which links TFS features to gestures, is all the more interesting because the dialectical interaction between speaking and gesturing in the GP brings out some very subtle, yet profound, semiotic effects that do not emerge so readily in the analysis of speech alone. In particular, Slobin’s (2003) research suggested a number of areas where languages differ with regard to TFS features, including temporal marking, spatial encoding (i.e., absolute vs. relative direction marking), and motion events. It is the last of these three domains that to date has been of greatest interest to gesture researchers, including those working on L2 performance.

Talmy (2000, p. 26) categorized motion events according to six criteria: (a) figure: an object moving or located with respect to another object (ground); (b) ground: a reference object in relation to which the figure moves; (c) path:

trajectory or site occupied by the figure; (d) motion: changes of locatedness in the event; (e) manner: the particular way the motion is performed; (f) cause: the efficient origin of a change in motion or location. According to Talmy, languages are grouped into two general typologies, depending on how they express path of motion events: satellite-framed (S-) and verb-framed (V-) languages. English, a typical S-language, indicates path of motion through particles or adverbs, whereas manner of motion is frequently conflated with the verb; for example, in “Tarzan swings through the jungle,” the manner in which the figure, “Tarzan,” moves is encoded directly in the verb “swing,” whereas the path of the motion against the ground, “jungle,” is expressed in the particle “through.” In a V-language, such as Spanish, the manner of the figure’s motion, if expressed at all, is most often not encoded in the verb but in a separate lexical constellation, and path is conflated with the motion verb—for example, in *Tarzan salta (de liana a liana) por la selva* “Tarzan jumps (from vine to vine) through the jungle.”

The English lexicon is highly saturated with verbs that conflate motion and manner (e.g., trudge, skip, hop, slide, sidle, shinny, scamper, sweep, leapfrog, and countless others; Slobin, 2003). Although a language such as Spanish has an inventory of manner verbs (e.g., *tambalearse* “to tumble,” *trepar* “to climb,” *agitar* “to agitate”), these verbs are relatively few in number compared to English and, in performance, they occur much less frequently. Thus, English-speaking children are immersed in communication that strongly draws their attention to the fine-grained aspects of motion events. Although Spanish-speaking children might have their attention drawn to manner, it will most often be achieved in a much less graphic way (Slobin). Thus, whereas a Spanish-speaking child might be told that *un perro está corriendo por el jardín* “a dog is running through the garden,” an English-speaking child might be told that “a dog is scampering through the garden.” Consequently, English speakers are much more likely than their Spanish counterparts to develop a “rich mental imagery of manner of motion” and the “manner of motion will be salient in memory of events and in verbal accounts of events” (Slobin, p. 164).

When gestures are brought into the picture, things become even more interesting. V-languages and S-languages synchronize speech and gestures in markedly different ways. English speakers, for example, coordinate manner gestures with manner verbs if they want to focus on the manner of a motion event and allow the spoken portion of the message to indicate path of motion. If English speakers opt to defocus manner, they are still likely to use a manner verb but will forego a manner gesture. McNeill and Duncan’s (2000) research has shown that English speakers rarely use manner gestures in the absence of a conflated manner verb. Spanish speakers, on the other hand, coordinate path gestures with conflated path verbs or with ground noun phrases (NPs). According to McNeill and Duncan, signaling manner in Spanish is a “challenge appearing only when it is a focused component, and it is often omitted even when it is potentially significant” (p. 152). Spanish—unlike English—allows use of a manner gesture in the absence of a manner verb; moreover, manner gestures can

co-occur with path verbs and ground NPs, spreading over the entire event as a fog (McNeill, 1997). This common pattern in Spanish is referred to as a manner fog, in which GPs “with manner are categorized and enter the linguistic system as path and/or ground” (McNeill & Duncan, p. 150).

The examples given in Table 1 illustrate the interface between speaking and gesturing in English and Spanish. The speakers are narrating a scene from a Tweety Bird cartoon in which Tweety drops a bowling ball down a drainpipe as Sylvester Cat is climbing up through the inside of the pipe. In the first example, the speaker focused on the manner of Sylvester’s motion as the bowling ball pushes him out the bottom of the pipe. Note that manner is doubly marked (an indication of speaker focus) through the synchronization of the manner verb, “roll,” and the manner gesture. In the second example, a different speaker describing the same event focused on the path of Sylvester’s movement rather than on the manner of his motion. The speaker signaled this by coordinating the stroke of a path gesture with the production of the satellite, “down,” and then held the gesture throughout the production of the ground NP “the drain spout.” In speech, the two utterances seem to reflect the same motion event: Sylvester rolling out of the drainpipe. Cognitively (and, of course, communicatively), however, the utterances are not equivalent, as revealed through the differences in gesture synchronization. Even though both speakers used the manner verb “roll,” they did not think about the event in the same way. Their gestures betrayed different GPs; thus, at the level of inner speech, the speakers perceive and think about the same event in markedly different ways, and this difference is reflected in the imagistic portion of the respective utterances.

In the third example, a Spanish speaker narrating the same scene used neither a manner nor a path gesture and, instead, focused on the shape of the ground NP, which is encoded in gesture only. In the final example, the same speaker indicated Sylvester’s path both verbally and in gesture as the cat goes up through the drainpipe. The speaker held the shape of the drainpipe initiated in the previous example and moved his hands upward, thus indicating Sylvester’s movement up the pipe. He simultaneously marked the manner of the cat’s motion by rocking his hands back and forth. The verb *meterse* “to go into” marks path only. The result is a manner fog in which manner is marked only through the gesture that is spread over the entire utterance. Path, on the other hand, is indicated both in speech and in gesture.

Gesture in L2 performance. To my knowledge, only four studies on gesture within the TFS framework have appeared in the L2 research literature. The relevant question addressed in this research is whether L2 speakers are able to synchronize their speech and gestures according to the TFS patterns manifested by native users of the new language or whether they continue to deploy their L1 patterns. This is a significant question because it relates directly to L2 self-regulation. Presumably, if speakers display L2 patterns, they are relying on L2 meanings, not just L2 forms, as they engage in communicative interactions.

Table 1. Interface between speaking and gesturing in English and Spanish

Example number	Utterance	Gesture	
		Type	Motion
1.	but it <u>rolls</u> him out	Manner	Hand wriggles
2.	and he rolls... <u>down</u> the <u>drain</u> spout	Path	Hand plunges straight down
3.	<i>e entonces busca la manera</i> [<u>silent pause</u>] “and so he looks for the way”	Ground gesture	Depicts the shape of the pipe
4.	<i>de entrar</i> // <i>se mete por el desagüe</i> // <i>¿sí?</i> “to enter REFL- <u>goes into</u> through the drainpipe, yes?”	Path + Manner	Both hands rock and rise simultaneously: Manner and path (left hand only through <i>mete</i>). Right hand continues to rise with rocking motion

Note. The gesture co-occurs with the underlined portions of each utterance.

Source. McNeill & Duncan, 2000, p.151.

Using the Tweety Bird cartoon, Stam (2001) investigated the gesture-speech interface in the performance of five intermediate and five advanced ESL (Spanish L1) speakers. She reported that some advanced and even some intermediate speakers exhibited the beginnings of a shift toward English TFS as they occasionally synchronized path gestures with satellites—the preferred English pattern. With regard to the critical manner feature, however, all of the L2 speakers adhered to the Spanish L1 pattern, relying on gesture to encode manner fogs, if it was encoded at all.

Özyürek (2002), also using the Tweety Bird cartoon, investigated the speech-gesture patterns of L1 Turkish speakers in L2 English. Turkish is a V-framed language, but, unlike Spanish, it expresses manner and path through separate verbs. In Turkish, one would describe the scene where Sylvester rolls down the drainpipe as *yuarlanarak iniyor* “roll-connector descend,” which might be rendered through English as “He is rolling; he goes down” (Özyürek). Three groups of L2 speakers (beginning, intermediate, and advanced) participated in Özyürek’s study. Of these, only the advanced group showed any evidence of English patterns in their narrations. They occasionally encoded manner on the verb and indicated path through a satellite phrase, as in “He rolls down the street.” Three of the six advanced speakers also used a gesture that conflated manner and path—a possible English pattern, provided that the stroke of the gesture synchronizes with the manner verb. Unfortunately, Özyürek did not provide any evidence for this important matter. Speakers in the two other groups consistently preferred their L1 Turkish pattern and, thus, encoded manner and path with separate verbs. As it turns out, all of the advanced speakers had resided in the United States for 10 years before returning to Turkey to take up positions as lecturers at a university. Özyürek remarked that “the verb and satellite construction used dominantly [*sic*] by native speakers of English is a hard construction to master for Turkish speakers in L2 and needs years of practice in a country where the L2 is spoken. That is, typologically distinct and different constructions across languages are hard to learn in L2” (p. 508).

A third study, by Kellerman and van Hoof (2003), reported that although L1 speakers of Dutch shifted their gesture patterns when speaking L2 English, the pattern they manifested was Spanish-like; that is, gestures synchronized with path verbs (rather than with satellites, the English pattern; see Table 2).

Table 2. Interface between speaking and gesturing in L2 English

Utterance	Gesture	
	Type	Motion
And Timmy was <u>thrown</u> over his head	Path	Hand flicks from left to right

Note. The gesture co-occurs with the underlined portions of each utterance.

Source. Kellerman & van Hoof, 2003, p. 262.

According to the authors, this was a surprising finding, given that Dutch is an S-language, like English. In English, the stroke of the path gesture would normally occur on the satellite, “over,” rather than on the motion verb. The authors are at a loss to explain the apparent anomaly in the performance of the Dutch speakers. It remains an unanswered, but most intriguing, question.

None of these three studies reported evidence of a shift in gesture patterns with manner verbs. The fourth study, carried out by Negueruela, Lantolf, Jordan, and Gelabert (2004), included advanced L1 English speakers of a L2 V-language (Spanish) and L1 Spanish speakers of a L2 S-language (English). This was a missing component in the design of the previous studies. All of the speakers were graduate students at a university in the United States and all had spent time living in a country where the L2 was spoken. The stimulus in this study was Mayer’s (1972) well-known frog picture story. No evidence of a shift toward the L2 patterns of speech/gesture synchronization was found.

A typical pattern produced by the L2 English speakers is illustrated in the first example in Table 3. The speaker was describing a restaurant scene where a frog suddenly leaps out of the old woman’s salad and moves toward her face. The speaker used the English cognate of the Spanish verb *aparecer* “to appear”—which would be a common way of depicting the motion in Spanish—and highlighted, through gesture, the frog’s path rather than the manner of its motion. One of the L1 Spanish speakers produced essentially the same utterance in Spanish but without a gesture to describe the same event: *Le aparece la rana* “To her appears the frog.”

When the L1 Spanish speakers marked manner in English, they preferred to do so in gesture only, and often the gesture was conflated with a path verb. In the second example of Table 3, the speaker narrated a scene where various eating utensils fly (as described from an English L1 perspective) off the dining table as a result of the frog’s movements. The speaker brought manner into focus, as indicated by the vigor of her hand movements conflated with the path gesture that showed movement against the ground NP, “table.” This is not a typical English pattern for highlighting manner because the spoken component does not contain a fine-grained manner verb (e.g., fly). Moreover, in the absence of upward hand movements indicating path, one could easily assume that the utensils were simply falling to the floor.

The general impression that an English L1 listener might construct on the basis of the L2 narratives produced by the Spanish speakers is that the story was lacking in real action. This is no doubt due in large part to an absence of complex manner verbs—something L1 English speakers expect to find in such stories. Indeed, this expectancy presented itself as a problem for the English speakers when narrating the story in L2 Spanish. This is illustrated compellingly in the third example of Table 3, in which an L2 Spanish speaker attempts to describe a scene where the waiter is carrying a plate of salad in which the frog has hidden. As the waiter walks through the restaurant, the salad begins to move because of the frog’s motion. The speaker attempted what appears to be a progressive construction comprising the auxiliary *estar* “to be” and a

Table 3. Interface between speaking and gesturing in advanced L2 English and L2 Spanish

Example number	Utterance	Gesture	
		Type	Motion
1.	the <u>frog</u> appears...from inside the salad	Path	Both hands coming up toward the speaker's face
2.	and the <u>cup</u> , the <u>plate</u> , the <u>fork</u> are all <u>falling</u> off the table	Manner + Path	Four consecutive strokes with both hands, palms facing each other, vigorously moving upward (last stroke more pronounced)
3.	<i>la ensalada <u>está</u>...como en medio aire</i> "the salad is...like in mid-air"	Manner	Hand shaking, palm down
4.	<i>la ensalada echa <u>un desastre</u></i> "The salad is a disaster"	Manner	Hand shaking

Note. The gesture co-occurs with the underlined portions of each utterance.

Source. Negueruela et al., 2004, pp. 134–136.

verb in the progressive form. She paused, however, which—according to the researchers’ analysis—signaled a search for a verb that conflates motion and manner. Failing in her search, the speaker compensated by describing the position of the salad, “in mid-air,” synchronized with a manner gesture to depict its motion. Spanish has an appropriate, but fairly low frequency, manner verb, *tambalearse* “to tumble,” which would have imparted the meaning that the speaker was most likely trying to construct. The authors pointed out, however, that most L1 speakers of the language would not be likely to use this option, preferring instead to use either a less fine-grained motion verb such as *moverse* “to move” or—as one of their participants did—describe the condition of the salad verbally and encode motion in gesture only (see the fourth example in Table 3).

The overall picture of the gesture-speech interface in L2 use is murky. There is some evidence that advanced L2 speakers can construct GPs that reflect native-speaker patterns, at least for path of motion events. Whereas two studies (Özyürek, 2002; Stam, 2001) found support for this possibility, a third study (Negueruela et al., 2004) reported no evidence of a shift in this domain. A fourth study (Kellerman & van Hoof, 2003) uncovered what at this point seem to be anomalous results. However, there is no evidence so far that speakers are able to shift to L2 patterns with regard to manner of motion.

Although path of motion is marked differently in V- compared to S-languages, it is nevertheless marked (i.e., V-languages encode path in the verb, whereas S-languages encode path in the satellite phrase). The encoding of manner, on the other hand, presents a different situation. As mentioned, English has an exceptionally robust repertoire of fine-grained manner verbs, whereas Spanish does not. Thus, as Slobin (2003) suggested, one would expect English speakers to exhibit enhanced sensitivity to the manner in which motion events occur, whereas the same would not hold for Spanish speakers. Although Spanish has ways of encoding manner, including manner adverbs and gesture, L1 speakers in the study by Negueruela et al. (2004) preferred to encode manner, if at all, through gesture only.⁸ These results imply that L1 English learners would have to desensitize themselves to the manner of motion events, and L1 Spanish speakers would have to develop precisely this manner sensitivity when speaking English. We might even predict that, everything else being equal, L1 Spanish speakers would have an easier time when learning English because they would need to take on a new perspective on TFS about motion events. English L1 speakers, on the other hand, would have a more difficult task moving to L2 Spanish because they would have to downplay their need for fine-grained descriptions of manner. This is an intriguing prediction that can only be answered by future research. What is at issue is not just communicating in a L2, but TFS through this new language.

Conceptual Metaphors and L2 Mediation. In this subsection, I will discuss another important area for L2 research from the SCT perspective: the mediational role of conceptual metaphors (Lakoff & Johnson, 1980, 1999). Lan-

tolf (1999) proposed that in the acquisition of a second culture, there is potentially much more at stake than learning how to comply with the behavioral (linguistic or otherwise) patterns of a host culture. He argued that the acquisition of a culture is also about the appropriation of cultural models, including scripts, schemas, narratives, rituals, and, above all, conceptual metaphors (Shore, 1996). Contrary to the view often expressed in mainstream linguistics, metaphor is not at the margins of language, but, in fact, "is at the very heart of everyday mental and linguistic activity," as Harris (1980) convincingly argued (cited in Lantolf, 1999, p. 42). Surveying psycholinguistic research, Gibbs (1994) concluded that people are just as likely to process figurative, as they are literal interpretations of messages, without first processing the literal meaning. Giora (1997) proposed the gradient salience hypothesis to account for this finding. According to this hypothesis, people process utterance meaning on the basis of what they assume to be an interlocutor's primary intention. If they decide figurative meaning is salient, they process this and only this meaning, and if they decide that literal meaning is salient, that meaning is what they process.

Conceptual metaphors are distinct from linguistic metaphors, although they are not unrelated. Thus, expressions such as "Is that the foundation for your theory?" "The theory needs more support," "Our marriage is on the rocks," and the like are linguistic manifestations of different underlying concepts through which we attempt to understand one domain (the target domain) in terms of another (the source domain) (Kövecses, 2002, pp. 4–5). According to Kövecses, "a conceptual domain is any coherent organization of experience" (p. 4). Thus, conceptual metaphors are culturally structured models for organizing experience that underlie and, at the same time, are made manifest in the linguistic expressions we traditionally think of as metaphors. For example, a pervasive conceptual metaphor in much of the Anglo world is ARGUMENT IS WAR; thus, when English-speaking people talk about and—just as important—think about an argument, they do so through this culturally constructed concept and its affiliated linguistic manifestations, including such utterances as "Your claims are indefensible," "His criticisms were right on target," and "He shot down all of my arguments" (Kövecses, p. 5).

In Lakoff and Johnson's (1980, 1999) framework, conceptual metaphors arise from our embodied experiences in the world. In many cases, these experiences are shared across cultures. For example, our experience of vertical space and the force of gravity seem to be common across cultures and, in general, UP IS GOOD and DOWN IS BAD, and UP IS MORE and DOWN IS LESS. In English, it is common to talk about improvement as moving upward (e.g., "Mary has received higher grades this semester"), and language proficiency measures such as the Oral Proficiency Interview rate speakers not on a horizontal but on a vertical scale, with higher numbers indicating higher levels of proficiency. It must be recognized, however, that culture serves a central, "perhaps defining, role in shaping embodiment and, consequently, metaphorical thought" (Gibbs, 1999, p. 153). For example, the Anglo concept of "self"

is sharply distinguished from “the other” and is smaller than one’s body (Kearney, 1984, p. 150). Thus, Anglos often talk about “my body” and “my face” and distinguish quite clearly the solo individual from groups of individuals; indeed, in the United States, much of the legal system is concerned with the protection of the individual, individual privacy, and private property from infringement by others. In contrast, the Wintu culture of northern California conceptualizes the self and other as a “continuum with an unspecified Self at one end which merges by degree with the Other” (Kearney, p. 150). This does not mean that the self and the other are indistinguishable, but that the connection between these is continuous rather than walled off. Indeed, Wintu, according to Kearney, does not have a word for their unlocalized and diffuse concept of self and other; moreover, the very idea of the individual having to be protected from incursions of the other is anathema (Kearney, p. 150). Linguistically, the Wintu normally do not distinguish between singular “I” and plural “we,” as in the verb *harada*, which means “I go” and “we go,” and the pronouns *ni* “I” and *niterum* “we” are reserved for clarification purposes (Kearney, p. 151). Similarly, S. Scollon (1993, 1999) pointed out that in Cantonese culture, the self and the other are not as sharply demarcated as they are in Anglo culture, but, instead, form an integrated unit to the extent that freedom for Cantonese is the freedom to flock together, precisely the circumstance from which Anglos so often insist on liberating themselves.

The relevant question is: To what extent are L2 learners able to appropriate the conceptual metaphors of another culture, which means that the metaphors achieve the status of psychological artifacts in the service of mental activity? It seems that if learners are able to control linguistic metaphors, there is at least a possibility that they have appropriated the underlying conceptual metaphors. On the other hand, if they show no understanding of linguistic metaphors in the L2, it is not likely that they have appropriated the underlying conceptual metaphors. As Kecskes and Papp (2000) pointed out, idioms have traditionally been treated as purely linguistic phenomena, “as a special set of the larger category of words,” and, as such, are “cut off from the conceptual system” (p. 98) that underlies thinking (see also Kövecses & Szabó, 1996).

In a study of learner use and comprehension of L2 idioms, Irujo (1986) found that advanced ESL learners (L1 Spanish) were able to translate idioms from Spanish into English, but only when they perceived a similarity between the idioms, as in *consultarlo con la almohada* [to consult it with the pillow] “to sleep on it.” In a later study on fluent but late Spanish-English bilinguals who lived and worked as professionals in an English-speaking community, Irujo (1993) reported that these individuals were able to produce appropriate English idioms on a task designed to elicit idiomatic usage. She cautioned, however, that this does not mean that the speakers were able to use the idioms in spontaneous linguistic performance, a sentiment reflected by Yorio (1989), who remarked that even if learners can recognize L2 idioms, they tend to avoid using them or use them inappropriately in spontaneous performance.

In a series of interpretation, translation, and paraphrase tasks, Danesi (1986) reported that elementary, intermediate, and advanced university classroom learners of Italian as a foreign language had virtually no ability to deal appropriately with linguistic metaphors in the L2. In a second study, with advanced learners of Spanish, Danesi (1992) compared the metaphorical density of students' written texts (i.e., percentage of sentences containing metaphorical expressions out of the total number of sentences produced) with similar texts from L1 writers of Spanish and found a statistically significant difference between the groups in favor of the L1 writers. Even when the learners used metaphors, like Irujo's (1986) subjects, they used those shared by the two languages.

Kecskes and Papp (2000) similarly reported that Hungarian learners of French, Russian, and English as foreign languages produced a significantly lower percentage of metaphors in their L2 texts than they did in their L1 texts. Moreover, they reported that the lower the students' L2 proficiency, the more likely they were to rely on "L1-dominated metaphorical thinking" when writing in the L2 (p. 102). On the other hand, Johnson and Rosano (1993) reported on a study that showed that ESL learners seemed to be able to interpret English metaphors as well as L1 speakers of the language, despite their relatively low level of linguistic proficiency. The researchers concluded that metaphorical competence is independent of linguistic proficiency and, therefore, correlates with pragmatic rather than linguistic competence.

One might be tempted to explain the difference between the findings of Johnson and Rosano (1993) and the other studies by the fact that ESL learners tend to have extensive immersion experiences in the target speech community outside of the classroom environment, whereas foreign language learners generally do not. Valeva (1996), however, pointed out a significant problem in the way Johnson and Rosano interpreted the performance of the ESL learners, which potentially calls into question their overall findings. The task they set for their participants called on them to interpret a series of metaphorical sentences, such as "My shirt was a butterfly" and "My shirt was a mirror." Valeva argued that "metaphoric competence is reducible neither to complexity nor to the number of metaphor interpretations" produced by speakers, but "depends crucially . . . on the content of these interpretations" (p. 31). Thus, according to Valeva, it matters that the ESL participants in Johnson and Rosano's study interpreted "My shirt was a butterfly" as signifying beauty, color, and activity, whereas for the L1 speakers, the same sentence signified softness and fragility. In other words, although the L2 speakers understood the sentences as metaphorical and were able to assign them multiple potential meanings, they did not interpret them as emanating from the same underlying conceptual metaphor as did the L1 speakers.

Danesi (1992) and Irujo (1993) laid the blame for the failure of L2 learners to appropriate the metaphors and idioms of a new language on classroom pedagogical practice. Valeva (1996)—appropriately, in my view—reserved judgment on whether it is possible to teach metaphorical knowledge until the

learnability question can be answered; that is, is “a SL conceptual system learnable in the first place?” (p. 36). I consider this issue in the following subsection.

Learnability of L2 Concepts. Pavlenko (1996, 1997) investigated the spontaneous use of the Anglo concept of privacy by L2 speakers of English (L1 Russian). Space does not permit a detailed look at Pavlenko’s insightful analysis of English and Russian with regard to this concept, for which she employed a procedure that Valeva (1996) contended is necessary in order to appropriately investigate the learnability question. Pavlenko pointed out that although Russian has words that translate liberally into English as privacy, the words are not semantically equivalent to their English counterparts. Russian does not have a noun corresponding to English privacy and uses adjectives and idiomatic expressions instead. In English, private is maintained in opposition to public; in Russian, it can also be opposed to public, but, for example, as in the case of private office, it means belonging to the individual rather than to a group of individuals. In other words, it refers to a concrete entity rather than to a psychological attitude, as it can, and usually does, in English. In Russian, unlike in English, private does not have connotations such as secret, confidential, strictly private information, secluded, or away from public view. Moreover, privacy in English can extend to private space, private time, and even to “people valuing privacy (a very private person)” (Pavlenko, 1996, p. 53), whereas the Russian concept has none of these meanings. The very idea of invasion of privacy is unknown in Russian culture and, by the same token, there are many fewer taboos on personal contact in public spaces among Russians than is the case for their American counterparts. In Russian, the “sphere marked ‘secret’ and ‘personal’ is much narrower, concentrating mainly on the intimate, sexual details of one’s life” (Pavlenko, 1996, p. 56), whereas in American culture, the individual is considered to have the right to control access to information about all personal aspects of one’s life.

Pavlenko created a 3-min silent film that depicts a young woman who strolls through a crowded public plaza and then decides to sit in an empty area of the plaza. While sitting, she begins to write, stopping from time to time to look around. At one point, a young man approaches and sits a few feet away from her. The young woman then looks around again, but does not look at the young man. She puts the paper back into her bag and walks away (Pavlenko, 1996, pp. 56–57). The film was viewed by university students who were monolingual speakers of English, monolingual/monocultural Russian immigrants recently arrived in the United States (1–3 weeks of residency), and proficient L1 Russian speakers of L2 English, subdivided into two groups—eight L2 speakers who had studied English as a foreign language in Russia and had been in the United States from 1 to 3 weeks at the time of the study, and eight L2 speakers of English who had been living in the United States from 4 to 6 years at the time of the study. Four participants in each subgroup talked about the film in English and four did so in Russian.

Typical of the L1 English narratives were utterances such as the following, produced by a 23-year-old male: “*she felt almost invaded, like her privacy was being invaded*” (Pavlenko, 1996, p. 58). None of the L1 Russian monolinguals produced utterances that referred to personal space or the invasion of privacy or that expressed the idea that the young woman felt uncomfortable with the young man sitting near her. Whereas the Americans mentioned spatial-privacy issues a total of 11 times in their narratives, the typical L1 Russian assessment was that the woman was not interested in what they described as an attempt at a “pick up” by the man. The Russian monolinguals also mentioned that she did not like him or that she was afraid of him. As for the bilinguals, none of the recent arrivals described the scene as depicting an intrusion on personal privacy. They also frequently remarked that the woman was not interested in a “pickup” or that she did not like the man; thus, they behaved very much like the Russian monolinguals. Of those Russians who had been living in the United States for an extended period of time, several mentioned that the woman’s personal space had been violated by the stranger—an indication, according to Pavlenko (1996), that they had appropriated the American conceptual metaphor of PRIVACY. Moreover, this group encountered fluency problems when relating the story in Russian, which, in Pavlenko’s analysis, stems from the lack of an appropriate concept of privacy in Russian. The speakers paused, stuttered, and produced what Pavlenko called conceptual code-switches, in which they generated literal translations of such constructions as “her space was invaded” or circumlocutions resulting in “ungrammatical Russian utterances, which violated both morphosyntactic conventions and lexical-semantic constraints of the language” (p. 66). Pavlenko’s research provided some evidence that under conditions of cultural immersion, L2 speakers are able to appropriate concepts and use them to mediate their thinking processes, thus providing some positive evidence in response to Valeva’s (1996) learnability question.⁹

Among the questions that emerge from research on the acquisition of concepts and conceptual metaphors in a L2 is the precise nature of the relationship between metaphorical and linguistic competence. Are they separate competencies or do they constitute components of the same ability? In particular, the scope of the human communicative system must be addressed. Agar (1994), for example, argued that the perspective fostered by linguistic theory in the Saussurian and Bloomfieldian tradition is far too narrow because it segregates language from culture. McNeill (1992), for instance, made a strong argument that gestures must be incorporated into any theoretical framework of human communication, and the position of cognitive linguists is quite clear regarding relevance of conceptual metaphors (and other categories of figurative language, like metonymy and synecdoche) for any model of the human communicative system (see Croft & Cruse, 2004, for a recent update on the theory). Littlemore and Low (in press) made a convincing case that models of communicative language ability—in particular, the model proposed by Bachman (1990)—must incorporate metaphorical competence as part of what learn-

ers need to acquire. A second, and no less important, question, as suggested by an anonymous *SSLA* reviewer, is how metaphorical competence develops in L2s. The simple answer at this point is that we just do not know. Research by Boers (2000, 2003), Boers and Demecheleer (2001), and Littlemore (2001) showed that L2 learners are able to identify and assign an interpretation to metaphors in the new language, but their interpretation does not match that of L1 speakers. Clearly, this is an important area for future L2 research and is related to the final topic considered: internalization.

INTERNALIZATION

Internalization is the process through which members of communities of practice appropriate the symbolic artifacts used in communicative activity and convert them into psychological artifacts that mediate their mental activity. Through internalization, symbolic artifacts lose their exclusive unidirectional quality (intended for social others) and take on bidirectional functions (intended for social others and the self). According to Kozulin (1990), “the essential element in the formation of higher mental functions is the process of internalization” (p. 116). Vygotsky (1978) addressed internalization in the often-cited statement that every psychological function appears twice: first between people on the interpsychological plane and then within the individual on the intrapsychological plane. The problem is precisely how we are to interpret what Vygotsky meant by intrapsychological. Frawley (1997, pp. 94–95) noted that Vygotsky’s original Russian term was *vrashchivanie*, which means something like “in-growing,” and is sometimes translated into English as “interiorization.” This term implies the emergence of “active, nurturing transformation of externals into personally meaningful experience” (Frawley, p. 95), but it does not imply that things literally pass whole cloth into our heads. In the words of Luria (1979), “it is through this interiorization of historically determined and culturally organized ways of operating on information that the social nature of people comes to be their psychological nature as well” (p. 45).

Internalization enables humans to abstract from physical objects and material actions; thus—unlike in the case of appropriation in other animals—human thinking is freed from “the realm of perception” (Arievitch & van der Veer, 1995, p. 123). Luria (1982) referred to this as displacement. In this view, internalization does not imply that mental activity must be carried out exclusively inside the head. We can, for instance, rearrange furniture by imagining the process completely internally, or we can use a sketchpad or a computer display to visualize the activity. The important point is that in either case we are functioning on the ideal rather than the concrete plane; this capacity frees us from the actual physical presence of the furniture. Similarly, Wertsch (1998) pointed out that when carrying out processes such as multiplication with three-digit numbers or higher, most of us rely on paper and pencil to come up with

the solution. The process is carried out symbolically, but not completely, inside of our heads.¹⁰

Internalization goes a long way toward explaining the continuity across time and space experienced by individuals, as is captured in Winegar's (1997, p. 31) definition of the concept:

Internalization is a negotiated process of development that is co-constructed both intra- and interpersonally. As such, it is a process of reorganization of the person-environment relationship that itself emerges with person-environment relationships. Through this process, immediate person-environment relationships are reorganized, and some aspects of this reorganization may carry forward to contribute to future reorganization. At least for humans, this process always is socially mediated whether or not other persons are physically present. Some patterns of previous and later person-environment relationships we experience as continuity.¹¹

Imitation

Vygotsky (1987) proposed that the internalization of socially constructed forms of mediation occurs through the mechanism of imitation. One of the earliest scholars to propose imitation as a uniquely human form of learning and development was Baldwin (1895/1915). For Baldwin,

imitation [especially what he called 'persistent imitation'] to the intelligent and earnest imitator is never slavish, never mere repetition; it is, on the contrary, a means for further ends, a method of absorbing what is present in others and of making it over in forms peculiar to one's own temper and valuable to one's own genius. (as cited in Valsiner & van der Veer, 2000, p. 153)

Persistent imitation entails cognitive activity; it is cyclic and reproductive, but each reproductive cycle works not on the original but on the previous imitation (Baldwin).

Vygotsky (1987), reflecting the thinking of Baldwin and others at the time, saw imitation as a complex and transformative activity and considered it to be "the source of all the specifically human characteristics of consciousness that develop in the child" (p. 210). Newman and Holzman (1993) stressed that imitation is not about parroting others, but is about creating something new "out of saying or doing 'the same thing'" (p. 151) that other members of the culture do.

Central to imitation is the capacity to map the goal of an activity on to the means through which it is carried out (Tomasello, 1999). This distinguishes imitation from emulation, in which the goal is recognized but the means is not. Humans are able to match the goal and the means of achieving some activity (imitation), whereas other primates, such as chimps, are able to recognize the goal of an activity without understanding the relevance of the means (emulation). Both imitation and emulation are distinguished from mimicry by

virtue of the fact that in the latter, an understanding of the goal is also absent (Baldwin's simple imitation). Humans, of course, are capable of all three actions, whereas other primates—at least in the wild—are able to emulate and mimic, but not imitate. Imitative learning of symbolic artifacts frequently occurs in symbolic play, in which a child decouples “the intentional affordances from their associated objects and artifacts so that they may be interchanged and used with ‘inappropriate’ objects playfully” (Tomasello, p. 85). The child plays with language as an object instead of using it to communicate, decoupling language from its normal communicative function (where attention is on purpose or goal) and focusing attention instead on the means—the semiotic tools and performative gestures that make up communication (Cazden, 1976).

Neuropsychology of Imitation. According to Meltzoff (2002), “imitation promises to be a hot research topic in the coming decade. Interest in imitation spread from a small band of aficionados to the broader community of cognitive scientists, evolutionary biologists, neuroscientists, philosophers, and development scientists” (p. 19). The rekindled interest in imitation stems from observations that neonates are able to imitate body movement from birth, which “reveals an innate link between observed and executed acts,” and this, in turn, reveals “a primordial connection” between the infant and caregiver (Meltzoff, p. 19). An especially significant finding of current research is that infant imitation frequently occurs following a delay, often of a day or more (Meltzoff). This means that infants can imitate the action—including linguistic action—of someone else on the basis of a representation stored in memory. As suggested by Baldwin's notion of persistent imitation, infants continuously correct their attempts at producing an imitative response, without adult feedback, until it comes close to matching the original action (Meltzoff). Thus, memory plays an important function in imitation, because it offers “a certain freedom from context specificity” (Meltzoff, p. 30). Imitative behavior is not limited only to hand and facial gesture, but it also occurs (as the infant matures) with cultural artifacts, including objects like toy telephones, hammers, and so forth, as well as language (Meltzoff).

The research of Iacoboni and his colleagues revealed that Broca's area is specialized for imitation—in particular, for imitation of goal-directed gestures (Iacoboni et al., 1999; Koski et al. 2002). The mirror neurons located in Broca's region fire whether the individual is performing or merely observing someone else engaged in an action. Crucially, mirror neurons in a different region of the brain fire when the action observed or carried out is not goal-directed. Thus, there is a neurological difference between finger movements aimed at imitating goal-directed models (e.g., finger movements that strike specific keys on a computer keyboard) and those aimed at finger movements that are random (e.g., tapping of fingers in a nervous tic). The conclusion reached by Iacoboni's team was that Broca's area is not specifically dedicated to an encapsulated language system; rather, the research suggests an evolutionary continuity among action, recognition, imitation, and language, and that a shared

set of neural mechanisms enables all of these forms of human communication (Heiser, Iacoboni, Maeda, Marcus, & Mazziotta, 2003, p. 1128).

Imitation in Language Acquisition. Arbib (2002) and Tomasello (2003) proposed models of language acquisition that assign a central role to imitation. Arbib's neurolinguistic model explains how human language could have arisen as a function of mirror neurons in Broca's area. The language capacity emerged from the capacity to "produce and perceive rapidly generated sequences of gestures," including manual as well as facial movements (Arbib, p. 257). The key evolutionary innovation was the capacity for brains to copy "compound actions," something that evolved in human as well as chimp brains; however, the distinction that eventually imbued humans with the language-making capacity was the facility for complex rather than simple imitation (Arbib). Crucially, human children are able to decompose complex actions into constituent components and then reassemble them into the desired pattern in a relatively brief time frame (Arbib). Included among the properties of the human brain that make it language-ready (along with naming, hierarchical structuring and temporal ordering, recursivity, memory and imagination, and learnability) is the mirror property: the property that underlies imitation.

Tomasello's (2003) psycholinguistic model proposed that "children begin to acquire language when they do because the learning process depends crucially on the more fundamental skills of joint attention, intention-reading, and cultural learning—which emerge near the end of the first year of life" (p. 21). From this perspective, language is a special and complex type of "joint attentional skill" that people employ "to influence and manipulate one another's attention" (p. 21; in SCT terms, mediate). The primary mechanism that operates in language acquisition is imitation; however, in the case of language, it must take on a different perspective from other forms of imitative action (e.g., facial movements, gestures). If children merely put themselves in the place of adults when imitating communicative intentions, they would end up directing the communicative symbols at themselves rather than others. Children must "engage in role reversal imitation" when learning to use symbols with adults (e.g., first and second person pronouns) in the same way adults use symbols with the child (p. 27). The linguistic symbol that results from role reversal imitation is then "understood intersubjectively from both sides of the interaction" (p. 27); that is, the learning process guarantees that children acquire socially shared symbols by coming to realize that interlocutors can both comprehend and produce the same or similar symbols. Thus,

using linguistic symbols in utterances is a social act, and when this act is internalized in Vygotskian fashion the product is a unique kind of cognitive representation that is not only intersubjective (involving both self and other), but also perspectival in the sense that the child understands that the same referent could have been indicated in some other way—the speaker could have chosen another linguistic symbol to indicate a different aspect of this entity. (p. 28)

Moreover, children are able to imitate not just language directed at them by adults, but they are also quite good at imitating language they are exposed to by eavesdropping on third-party conversations (p. 269).¹²

An especially significant finding of research on imitation is that children frequently defer imitation of their models for a day or more (Meltzoff, 2002). This permits children to analyze language offline (Meltzoff & Gopnik, 1989) and thus focus more attention on the model than they might be able to do during social interaction. Kuczaj (1983) and Weir (1962) documented offline analysis in children's self-directed speech produced when they were alone in their cribs. Moreover, deferred imitation points to a continuum between imitation and spontaneous language production, with deferred imitation serving as "essential building blocks for spontaneous speech" (Speidel, 1989 p. 163). As with Baldwin's persistent imitation, children also often continue to modify their imitations, even without adult feedback, until they approach the original model (Meltzoff). Memory then plays an important function in imitation because, among other things, it offers "a certain freedom from context specificity" (Meltzoff, p. 30)—clearly a crucial capacity for linguistic development to occur. However, not all imitative activity has language acquisition as its immediate goal, particularly during communicative interaction, where it can have pragmatic functions such as sustaining the interaction and tightening the bonds between parents and children. Nevertheless, even in these cases, we cannot rule out the possibility that it still has an impact on acquisition as a spin-off of its conversational function, not unlike what has been documented in some of the SLA research on the uptake of recasts during communicative interaction. Some child-language researchers also consider observation to be a type of imitation, arguing that observation and reproduction are situated on an imitation continuum "with respect to the degree of activation and elaboration of the central representational networks involved in the reproduction of the response" (Speidel & Nelson, 1989, p. 5). From this point of view, input processing models of language acquisition at some level implicate reproductive behavior—what Speidel and Nelson call symbolic motor acts.

The following examples, borrowed from Lightbown and Spada (1993), illustrate imitation in which children imitate all or portions of what they hear in their interactions with adults. Some of the imitations are close copies of the adult speech, others build on what the adult utters and look very similar to the pattern drills common in language classrooms, and yet others show clear cases of transformative imitation in Baldwin's and Vygotsky's sense. Lightbown and Spada do not share the perspective on imitation presented here. In their view, imitation is a copying process; thus, only the speech produced by children that mirrors adult patterns qualifies as imitation (Lightbown & Spada).

In (5) and (6), the child, Cindy—building on the original adult utterance by Patsy—produced speech that resembles classroom pattern drills, a common feature of child language (see Kuczaj, 1983). However, unlike in the language classroom, the primary intent is communicative. (For the transcription key, see the Appendix.)

- (5) Cindy (24 months, 16 days) is playing with a stuffed rabbit
 Patsy: What does this rabbit like to eat?
 Cindy: << >> eat the carrots. [she then gets another stuffed rabbit]
 Cindy: He << >> eat carrots. The other one eat carrots. They both eat carrots.
 (Lightbown & Spada, 1993, p. 4)
- (6) Cindy (25 months, 1 day) is playing with several dolls, one of which she calls a tiger
 Cindy: Doll go to sleep
 Patsy: Does the doll want to go to sleep?
 Cindy: [not answering Patsy, but talking to dolls in 'motherly' tones]
 Okay, I take you. Come on, Doll . . . << >> Go to sleep with the tiger
 << >> go to sleep. Doll wants to go to sleep.
 Patsy: Does the tiger want to go to sleep?
 Cindy: Tiger wants to go to sleep. The doll wants to go to sleep. He go to sleep.
 (Lightbown & Spada, p. 4)

Examples from another child, David, also illustrate the use of transformative imitation. In (7), David clearly used his mother's utterance to build his own.

- (7) David (3 years, 11 months)
 Mother: Get undressed [after many repetitions]
 David: I'm getting undressed.
 I'm getting *on dressed*.
 I'm getting on dressed.
 I'm getting *off dressed*.
 (Lightbown & Spada, p. 6)

Another example occurred at a 12th birthday party where adults proposed several toasts with grape juice, which they introduced with the common formulation "I'd like to propose a toast." Following a period of time during which no toasting had occurred, David (5 years, 1 month) uttered, "I'd like to propose a piece of bread." The adults—not realizing that David was serious—began to laugh, "which sent David slinking from the table" (Lightbown & Spada, p. 6).

The early research of Kuczaj (1983) and Weir (1962, 1976) with L1 children robustly documents not only imitation of phonology, syntax, vocabulary, and morphology that occurred during interaction sequences with adults and older peers, as illustrated in the previous examples, but also imitation that occurred when children were alone (e.g., in their beds prior to falling asleep at night). As suggested by Meltzoff's research, the language children produced when alone reflected features and patterns that they heard during their linguistic interactions earlier in the day (Kuczaj).

Imitation, Internalization, and Private Speech. Self-talk functions not only as a means to mediate and regulate mental functioning in complex cognitive tasks, but it also serves to facilitate the internalization of mental functions. Vocate (1994) and her colleagues, basing much of their research on Vygotsky's

theory of private and inner speech,¹³ considered what they termed intrapersonal communication as a conversation whereby the I-you of social interaction becomes an I-me dialogue, in which “I” makes choices on what to talk about and “me” interprets and critiques these choices (Vocate, p. 12). The joint selection and interpretation process carried out by I-me “is accompanied by entropic reduction and change” because “the adaptation process that increases the organization of the organism requires adjustments in either the individual, or the items to be ingested [i.e., internalized], or both” (Vocate, p. 12). Humans are capable of mediating their own development on the intrapersonal level, but in ways that reflect their interpersonal experiences (i.e., those activities valued and promoted by their particular community; see Tulviste, 1991). Clark (1998) noted that public language is ideally suited to be co-opted for intrapersonal functions because—as with social communication—the individual can employ it for inspection, critique, and the modification of ideas, concepts, and problems. Dennett (1998) described the developmental function of intrapersonal communication in what amounts to a modernized version of Vygotsky’s viewpoint:

We refine our resources by incessant rehearsal and tinkering, turning our brains (and all associated peripheral gear we acquire) into a huge structured network of competencies. In our own case, the principle components of this technology for brain manipulation are words, and no evidence yet unearthed shows that any other animal is capable of doing anything like what we do with our words. (p. 292)

Lantolf (1997, 2003) proposed that without private speech, language acquisition is not likely to occur. Similarly, Swain and her colleagues (Swain & Lapkin, 2000, 2001; Swain et al., 2002) argued that the language-focused talk that emerged during collaborative dialogue activity among learners was language acquisition and have supported this claim by implementing innovative online assessment procedures based not on what learners are expected to learn, but on what they actually focus on during their collaboration. Although I do not disagree with Swain’s perspective in principle, in my view, dialogic language can only serve internalization if the individuals attend to it as such. In other words, as Wells (1999) observed, social speech can have a private function if it is bidirectional in focus (i.e., simultaneously directed at the other as well as the self). If all of this is correct, it means that private speech is language acquisition. This, in turn, would mean that to the extent that learners externalize their cognitive activity in recordable speech, researchers would have access, at least in part (depending on how much private speech is fully verbalized), to the acquisition process. In the next two subsections, I will consider some samples of private speech produced by L2-speaking children and adults. The speakers focus on various aspects of the affordances made available by their linguistic environment. The children imitate models provided by their peers as well as their teacher. The adults do likewise; however, they also, on occasion, produce self-directed comments on their own performance—a feature missing in the child data.

L2 children. Saville-Troike (1988) studied the private speech of child L2 learners of English in a North American school setting. After analysis of audio and video recordings, she reported that over a 6-month period, six of the nine children under observation frequently produced intrapersonal talk that included repetitions of peer and teacher's utterances, recall and practice, creation of novel forms, expansion and substitution, and rehearsal for interpersonal communication.¹⁴ During this time, these children shied away from social speech in their L2, and although Saville-Troike related this behavior to Krashen's so-called silent period, it is clear that the children were anything but silent.

According to Saville-Troike (1988), the examples given in (8), produced by a 4-year-old, appear to evidence the learning strategy identified by Slobin: pay attention to the ends of utterances.

- (8) a. T: You need to be down here and waiting too.
 Child: Waiting too.
 b. T: What's happened there. [*sic*]
 Child: What's happened there.

(Saville-Troike, p. 578)

In (9), another 4-year-old appears to focus on participles and verbs, adjectives and adverbs, and compounds. We are not told if these utterances arose as an immediate reaction to utterances produced by a L1 peer or the teacher or whether the child spontaneously produced the utterances from something he had attended to in a very different time frame and stored away for later experimentation.

- (9) Child: Walking, walking, walk. Walking, walking, walk. [Chanted while walking]
 Child: Quick. Quick, Quick. Quickly. Quick.
 Child: Bathroom. Bath

(Saville-Troike, p. 584)

In (10), we see an illustration of Tomasello's (2003) observation that children are quite adept at imitating speech they overhear from conversations in which they are not directly involved. The child was playing alone with his back to a group of three other children but clearly was vicariously (see Ohta, 2001) involved in their language play activity.

- (10) Peer: Pooty
 Child: Pooty
 Peer: Pooty?
 Child: Pooty?
 Peer: Hey, look.
 Child: Hey, look.
 Peer: What are you doing?
 Child: What are you doing?

(Saville-Troike, 1988, p. 579)

Example (10) is also interesting from the perspective of Long's (1996) revised interactionist hypothesis, which recognizes that learning might occur in the absence of negotiation for meaning. The hypothesis integrates attention and processing capacity, which are "brought together most usefully, *although not exclusively* during negotiation for meaning" (Long, p. 414).

Finally, in (11), the child responded to two commands produced by the teacher in which he produced an inappropriate collocation, from a L1 perspective.

- (11) T: You guys go brush your teeth. And wipe your hands on the towel.
 Child: Wipe your hand. Wipe your teeth.

(Saville-Troike, 1988, p. 584)

Although under some circumstances it would be appropriate in English to wipe one's teeth (say, to remove a bit of lettuce), in terms of Tomasello's (2003) theory the child's utterances represent a case of schematization and analogy whereby the child appropriated a portion of the teacher's utterance to construct the template Wipe your-X, in which he then substituted an inappropriate (again with respect to the L1) nominal for X, "teeth." Moreover, the child produced the singular "hand" instead of the teacher's original "hands." Although not certain, it is possible that the lack of plural morphology in the child's L1, Chinese, preempted (a constraint on acquisition proposed by Tomasello) his uptake of the plural form produced by the teacher.

L2 adults. To my knowledge, there have been to date three studies that focus on imitation in adult private speech related to L2 internalization. The two most extensive projects are Ohta's (2001) two-semester study of L2 Japanese learners and Centeno-Cortés' (2003) one-semester study of L2 Spanish learners. The third is a smaller scale study (8 weeks) carried out by Lantolf and Yáñez-Prieto (2003) on a single learner. A notable difference between the adult studies and Saville-Troike's (1988) research is that the children produced more frequent self-talk than did the adults. A number of explanations are suggested to account for the difference. It could be that because adults tend to be more self-aware than children, they are more reticent than children to speak in a L2 when under the researcher's gaze. However, the adults in the work of Centeno-Cortés and Jiménez-Jiménez (2004), discussed previously, produced frequent private speech even though they were aware that they were participating in a research project. Nicholas, Lightbown, and Spada (2001), commenting on Ohta's research, pointed out that because Ohta's students were in a strong form-focused language class and because they wore individual microphones, "they may have been more aware that their language behavior was being monitored" (p. 742) and, thus, were more likely to respond to teacher's feedback than they might otherwise have been. Yet another possibility, suggested by Lantolf (1997), Lantolf and Genung (2002), and Gillette (1994), is that because not all students enrolled in adult university language classes are motivated to learn the L2—their goal might be to fulfill a language requirement—they are less likely to engage in language-focused private speech.

Indeed, Gillette's study found that students whose avowed goal was to fulfill a language requirement tended to rely on external devices (e.g., looking up rules and words in textbooks and dictionaries, practicing paradigms in their notebooks) and reported virtually no instances of private speech aimed at internalizing the L2. Lantolf and Genung (2002) observed that one student reported engaging in language-focused private speech only after classroom activities shifted from pattern drills and memorization of prepared responses to open-ended and more conversational interaction between teacher and students.

In the adult studies, patterns similar to those uncovered by Saville-Troike (1988) were also documented. In (12), one of Ohta's (2001) Japanese students engaged in a private pattern-practice-like activity with the Japanese adjectival form *waru* "bad":

(12) Candace: *waru- waruku (.) waru::ku (.) ku warui::*

(Ohta, p. 64)

Ohta pointed out that Candace's experimentation occurs without any immediate external stimulation from the teacher or other students. She first expanded the stem to form the adverbial *waruku* and then proposed the suffix; finally, she produced the nonpast adjective form *warui*.

Another adult pattern that parallels Saville-Troike's (1988) children is the selection of speech samples while eavesdropping on the performance of other speakers. The classroom learners in all three adult studies also frequently eavesdropped on interactions between the instructor and other students and produced what Ohta (2001) aptly called vicarious responses, illustrated in (13). Candace vicariously participated in an interaction between the teacher and another learner, where focus was on adjectival negation in Japanese.

- (13) T: *Kon shuumatsu hima desu ka? Hyun-san*
 "Huyn, are you free this weekend?"
 L: *Um (.) iie (.) um (.) uh:: (.) hima- (.) hima: (.) hima nai,*
 "Um (.) no (.) um (.) uh:: (.) free- (.) free: (.) free-NEG" (incorrect negator)
 T: *Hima ja e arimasen*
 "You're not free" (recast of the correct negator)
 L: *Oh ja arimasen [overlapping with teacher]*
 "Oh not free"
 Candace: *hima e ja arimasen [whispered and overlapping L]*
 "not free"
 T: *Hima ja arimasen (.) ii desu ne (.) Eh :to ja S-san kon shuumatsu hima desu ka?*
 "You're not free (.) well done (.) Uh so S, are you free this weekend?"
 (Ohta, p. 59)

Japanese has two ways of marking negation on adjectivals: one for adjectives and one for adjectival nouns; the first is formed by affixing the particle *-ku* to the adjective's stem and then adding the negator *nai* or *arimasen*, and the second is formed by affixing *-ja* (or *dewa*) to the adjectival noun accompanied

by the negative form *nai* or *arimsen* (Ohta, p. 58). Eavesdropping on the interaction between T and L, Candace repeated the correct form of the negative adjectival noun softly to herself and then used this form “correctly in peer interaction, as well as when, in subsequent teacher-fronted practice, she covertly corrects classmates who use the wrong form” (Ohta, p. 59).

Lantolf and Thorne (2005) reported on an ESL learner who vicariously participated in the interaction between the instructor and another student given in (14)¹⁵:

- (14) T: Were you taking a nap, a little sleep? [directed at another student]
 L: nap, I take nap . . . ing

The expression “taking a nap” was apparently new to L. She first repeated the noun “nap” and then, following role reversal imitation (see Tomasello, 2003), substituted the teacher’s “you” with “I” in the full phrase. She also substituted the simple present form of the verb “take” for the teacher’s progressive. As Lantolf and Thorne noted, the pause following the second repetition of “nap” might indicate her uncertainty as to whether “I take napping” is a possible English construction. Again, recall Saville-Troike’s (1988) child experimenting with the collocation “wipe teeth.” Centeno-Cortés (2003) documented a case in which one learner, participating in a Spanish L2 classroom during a study-abroad experience, overheard someone outside of the classroom produce an utterance involving repetition of the Spanish discourse marker *vale . . . vale, vale, vale* “Ok . . . ok, ok, ok.” She appropriated the expression and began to repeat it with the same intonation pattern as the original.

Adult language-focused private speech also shows that learners appear to have learning agendas that do not always coincide with the immediate aim of a teacher’s lesson. Lantolf and Yáñez-Prieto (2003) presented the example in (15), in which the instructor was working with one learner on Spanish passives while another learner actively—but vicariously—participated in the interaction and focused her attention on a particular feature of the construction: agreement of the past participle with the passivized subject.

- (15) T: *Los relámpagos encendieron los árboles.*
 “The lightning burned the trees.”
 L1: *Los árboles fueron encendidos por los relámpagos.*
 “The trees were burned by the lightning.”
 L2: *Encendidos.*
 “Burned.”

(Lantolf & Yáñez-Prieto, p. 107)

Imitating the past participle portion of the construction, Learner 2 overtly stressed the final two syllables of the word, an indication that her attention was clearly focused on the portion of the form that marks number and gender agreement.

In another part of the same lesson, the students were asked to produce a different type of passive construction in Spanish, often referred to as *se*-passive.

In (16), the instructor modeled a sentence in the so-called true passive and the learners were to convert it to the *se*-construction. Crucially, the verb normally agrees with the passivized object in the *se*-passive.

- (16) T: *Más autos fueron vendidos el año pasado.*
 “More cars were sold last year.”
 L1: *Se vende más autos.*
 “More cars is sold.”
 T: *Se what?*
 L3: *Se vendieron.*
 “Are sold.”
 L2: *Vendieron.* I knew it.

(Lantolf & Yáñez-Prieto, p. 106)

Following the teacher’s production of the original sentence, any student was free to respond. Learner 1 chose to speak up, but failed to mark the verb for plural. The teacher offered feedback that hinted at the problem. Learner 3 then produced the correct form. Privately, Learner 2 repeated the correct verb form and then told herself that she knew this was the correct form all along. According to Lantolf and Yáñez-Prieto, if Learner 2 really knew the correct response, it is interesting that she failed to speak up; instead, she waited for other students to respond. Most likely, Learner 2 did not have complete control over *se*-passive constructions and still required confirmation from others. However, following her self-confirmation, she very well could have, at that point, achieved full control. Unfortunately, the necessary piece of observational evidence—spontaneous use of the pattern in social performance—is missing. Indeed, future research on internalization must focus on uncovering this evidence in order to make the empirical connection between private speech and language acquisition.

An especially interesting implication of the private speech research on adult L2 learners is that there might be more frequent uptake of teacher recasts than much of the L2 literature reports. Lyster and Ranta (1997), for instance, found that in four French immersion classes, only about 31% of teacher recasts were repeated by students to whom the recasts were directed. Ohta (2000) suggested, however, that learners might not only uptake recasts in social speech but also in private speech and, as the research cited here documents, learners often vicariously respond to recasts intended for someone else. An example of vicarious uptake is given in (17), from Lantolf and Yáñez-Prieto (2003).

- (17) T: *Felipe devolverá el regalo.*
 “Philip will return the gift.”
 L1: *El regalo será *devuelto por Felipe.*
 “The gift will be returned by Philip.”
 T: Only it’s irregular. *Devuelto. Devuelto.*
 L2: *Devuelto.*
 “Returned.”

(Lantolf & Yáñez-Prieto, p. 107)

In response to Learner 1's erroneous regularization of the past participle of the verb *devolver* "to return," the teacher explicitly stated that the correct form is irregular and followed this with the correct form, *devuelto*. However, it is Learner 2 who privately uptook the correction, not Learner 1, the student to whom the correction was directed.

If, as Lantolf (2003) argued, imitation that occurs in private speech is language acquisition as it unfolds in real time, it is imperative to establish connections between what happens in private speech and subsequent social speech. Saville-Troike (1988) showed that the patterns and forms her children experimented with privately appeared in their social speech when they eventually reengaged socially with their classmates and teacher in the L2. This connection has yet to be robustly established in adults. Ohta (2001) and Centeno-Cortés (2003) both documented a few instances of a link between private speech and public performance for L2 adults, but use of the features attested in private speech imitation occurred in more or less pedagogical activities rather than in spontaneous social speech whose intent was communicative interaction. This is clearly an area where very interesting research can be conducted.

CONCLUDING REMARKS

In this article, I have presented an overview of what I consider to be, at the moment, the most relevant topics within SCT research on L2 development. At first glance, it might seem that the two general areas (concept-based mediation and internalization) represent two distinct research domains: one focused on meaning and the other on form. The distinction, however, arises from research practice, not from theoretical principle. As mentioned earlier, most of the data on adult L2 language-focused private speech were gathered in form-focused classroom settings. Consequently, it is not surprising that the learners under study paid a great deal of attention to language form in their private speech. The task for future research is to determine the extent to which adult learners parallel Saville-Troike's (1988) children in attending to form in settings where communicative activity predominates. An excellent place to begin this research is to concentrate on how learners appropriate and use focus particles in the L2 and how these, in turn, interface with gestures. It is also necessary to collect samples of private speech of L2 learners in nonclassroom settings. This is, of course, easier said than done—not only because of the technical problem of recording speakers as they move about in the everyday world but also because of the ethical issue of how far researchers can intrude into personal lives for the sake of data collection.

It is especially important for future SCT L2 research to document the process through which conceptual knowledge is internalized and develops and how this knowledge is, in turn, externalized in both social and cognitive activity mediated through the L2. It is in this domain—the domain where cultural

and personal meanings are foregrounded—that SCT finds the (cognitive) linguistic theory that Mitchell and Myles (1998) quite correctly pointed out has been missing. Cognitive linguistics, because of its commitment to meaning, resonates very well with Vygotsky's theory of mind as mediated by the semi-otic artifacts of a culture. This is not a claim that form does not matter; rather, it is an attempt to point out that because “we live in the age of the triumph of form” (Fauconnier & Turner, 2002, p. 3), meaning has become the stepchild of form, and if meaning is considered at all, it is usually “through systematic analysis of form” (Fauconnier & Turner, p. 4). On the contrary, according to Fauconnier and Turner, meanings arise as “higher-order products of imaginative work” (p. 8). In Vygotsky's theory, this work is a direct consequence of the organic and dialectical unity forged between communities and individuals. SCT L2 research has begun to explore the implications of Vygotsky's insight, but much remains to be accomplished. One of the most intriguing topics for future research is whether the appropriate pedagogical interventions can be designed to promote the development of conceptual and associated linguistic knowledge to enable learners to use the L2 as a mediational artifact.

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NOTES

1. Despite common assumptions to the contrary, Vygotsky's theory is not a social constructionist theory. For one thing, it is grounded in the historical materialist writings of Marx, whose theory assumes a material world existing independently of humans and that this world can be changed through the power of human collective and tool-mediated activity, not through discourse. For a fuller discussion of this important issue, see Lantolf and Thorne (2005) and Stetsenko (2005).

2. Vygotsky referred to the biological mental system as the primary—or lower—system and the culturally organized system he called the secondary—or higher—system. In this, he is neither claiming that primary is more important than secondary nor that higher is superior to lower; rather, his position is that uniquely human forms of mental activity arise solely as a consequence of the dialectical interconnection between what is provided by nature and what is offered by human culture.

3. The early research of Vygotsky and his colleagues as well as more recent research with L1 children (e.g., Diaz and Berk, 1992) and the work carried out with L2 learners shows that it is not necessary to instruct participants to use private speech. In fact, such an instruction would likely interfere with the natural production of this powerful means of mediating our cognitive activity (see Tchigaveva, 2004).

4. The private speech research also shows that most individuals are unaware of producing private speech when engaged in a complex problem-solving activity. Indeed, when the participants in the present study were interviewed following each session, they often apologized for not having produced any private speech, when, in fact, in most cases they had generated quite a bit of self-directed talk.

5. The fact that people fail to produce observable instances of private speech during a task does not mean that they are not engaged in self-directed talk at the subvocal level, as supported by Sokolov (1972). Indeed, this is the difficulty of carrying out research on inner and private speech; only externalized private speech is available for capture, whereas inner speech is never visible (although use of fMRI techniques might solve what until now has been an intractable problem).

6. According to Frawley (1997), particles and phrases such as “yeah,” “no,” “let's see,” and other focuslike features of language serve the self-regulatory function of intrapersonal communication.

7. For a recent series of studies on the implications of pointing for thinking, see Kita (2003).

8. Although Turkish is also a V-language, unlike Spanish it marks manner and path with separate verbs. More research is required on gesture-speech synchronization in such languages.

9. It cannot be concluded from Pavlenko's study, however, that cultural immersion in itself leads to the appropriation of new conceptual metaphors. Research by Belz (2002) showed that even in cultural immersion experiences, L2 users can resist the appropriation of new cultural artifacts for thinking while developing a high degree of communicative proficiency in the new language (see also Pavlenko & Lantolf, 2000).

10. Gibbs (1999) cautioned psychologists and linguists against what many take to be a self-evident assumption that "cognitive models must be explicitly represented in people's heads" (p. 154).

11. The concept of internalization has not been without its critics both within and outside of sociocultural theory. I am unable to consider this topic here. The interested reader can find a synthesis of the debates surrounding internalization in Lantolf and Thorne (2005).

12. Arbib's (2002) neurolinguistic and Tomasello's (2003) psycholinguistic models are much more complex accounts of language functioning and language acquisition than I can present here. The point of my discussion is to attest to the central role that imitation plays in both.

13. Rather than *private speech*, a term coined by Flavell (1966), Vygotsky, following Piaget and others, used *egocentric speech* to refer to speech that children direct at themselves. Unlike Piaget, however, Vygotsky (1987) proposed that this form of self-dialogue originated in social speech and represented a key phase in the development of inner speech—the source of verbal thinking.

14. Three of the children failed to produce overt private speech during the study. Saville-Troike (1988) characterized these children as socially rather than privately oriented, given that their preferred learning strategies appeared to be interpersonal from the beginning. These children, when communicating with English speakers, used "all means, verbal and nonverbal, at their disposal" (p. 586). The fact that the three children failed to produce audible private speech, however, does not necessarily mean they did not generate subvocal private speech.

15. The data were collected as part of Lantolf and Yáñez-Prieto's (2003) research but were not included in the published version of their study.

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APPENDIX

TRANSCRIPTION KEY

L	Learner
T	Teacher
[laugh]	Extra information
(recast)	Linguistic information
<< >>	Inaudible
(.)	Pause