1　Toward an embodied account of narrative development

In most psycholinguistic studies of the years from two to three, children are portrayed as engaged in relating *words* to *things*, and gaining the rudiments of grammar. But observations made in settings that are often inaccessible to study suggest that young children also produce narratives from a very early age. From a sociocultural perspective, when children produce narratives they engage in "verbal thinking," using cultural discourse genres to create, as Nelson (1996) put it, their "storied thoughts." In Bruner's (1990) terms, the narrative genre forms part of a *toolkit* of symbolic devices passed on to children from the adult world, and used, even by very young children, to interpret their experience of everyday life. We can, then, gain insight from the study of children's narratives into how coherent perspectives on events emerge, especially coherent accounts of the social world.

At a finer level of detail, what children are acquiring are *specific linguistic devices*. Of great importance are linguistic devices that range over more than one sentence, such as pronouns and clausal connectives (such as *but*, *because*, and *so*), and thus their meaning depends on what has been said in earlier discourse. These form the "cohesive system" of language, described in the pioneering work of Halliday and Hasan (1976) as the "text-forming" component of language. Cohesive devices are used by speakers to create coherence across sentences, and thus to create coherent discourse. The development of the cohesive function is a turning point in the relationship of language to thought. When children use cohesive devices to make language serve as its own context, they can "operate on. . .objects whose existence and identity are created through speech" (Wertsch, 1985, p. 150).

In this book, we build on and extend this tradition in two ways, one novel, the other to recapture something often overlooked. The novelty is to include gestures among the "linguistic devices"; gestures are intrinsically connected to the context of speaking and are natural carriers of cohesion. The overlooked is the seminal work of Werner and Kaplan (1963), whose project in many ways anticipates ours, but we add what they could not have, our modern gesture perspective. In writing this book, we have followed the line of argument presented in McNeill (2012). The line is that language is more than the

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lexicosyntactic forms that one sees in written texts and the analyses of linguis-
tics; it is also imagery, and imagery and language are inseparable. Imagery
fuels language and brings it to life, in the sense of everyday speaking, and also
in the sense of how language unfolds in young children. The ability to create
unities of language and imagery is responsible for a leap forward in develop-
ment, and makes language – extended, cohesive discourse – possible.

   The core of our approach to narrative development comes from McNeill's
(2012) account of a second ontogenesis, when children's utterances emerge
from context-dependent, embodied *growth points* (GPs). This is a transition
from a *single* to a *dual semiotic* ("semiosis" and "semiotic" refer to the nature
of symbols). In the single semiotic stage, speech and gesture co-occur, but are
not in opposition; rather, speech *supplants* gesture. In the stage of dual
semiosis, in contrast, the starting point of utterances (the GP) consists irredu-
cibly of two semiotic modes, linguistic and imagistic. Gestures offer one kind
of symbol, language a different kind, and the two kinds of semiosis are unified
in the GP; in a GP, symbols of these different orders combine. This "unity of
semiotic opposites," as we call it, creates a new form of human cognition that
animates language and gives it a dynamic dimension.

   In ontogenesis, the transition to dual semiosis corresponds to the beginnings
of cohesion – to a thought–language–hand link. The period of transition
between the single and the dual semiotic is a "dark age" because so little is
known about the relationship between speech and gesture at this time. A goal
of this book is to shed light on this transitional period. We gain insight from
two case studies of children between the ages of two and three. One comes
from the well-studied crib talk of two-year-old Emily, audiotaped in mono-
logue and in pre-sleep dialogues with her parents (Nelson, 1989b); and the
other from two-year-old Ella, videotaped at the kitchen table, while eating and
conversing with her father and other members of her family (Forrester, 2014).
Each of these everyday contexts generates a different type of talk, and from
them we gain different perspectives on the emerging context-dependence and
embodiment of cohesive devices, and thus on the development of coherent
narrations.

Vygotskian foundations

Our approach to narrative development, with respect to both the context-
dependence and embodiment of utterances, was inspired in large part by
Vygotsky's (1987) studies of the relationship between language and thought.
Our perspective on development, and on language more broadly, is of *change
along the dynamic dimension of speaking*. A crucial source of change is
the incorporation of the changing, constantly updated, itself dynamic, imme-
diate context of speaking. It is not that a GP – the starting point of an

utterance – "consults" the context or the context "sets parameters" for it; the GP *incorporates* it. These considerations are subsumed under the Vygotskian concept of a psychological predicate.

In a psychological (as opposed to a grammatical) predicate, newsworthy content is differentiated from a context. A psychological predicate marks a significant departure in the immediate context, and implies this context as background. Regarding the GP as a psychological predicate suggests that the mechanism of GP formation is differentiation of a newsworthy point of focus (a psychological predicate) from a background (a field of meaningful oppositions). A GP idea unit is both a point of differentiation and the context it differentiates. All of this is meant to be a dynamic, continuously updated process, in which new fields of oppositions are formed and new psychological predicates are differentiated in ongoing cycles of thinking for speaking. This is what we begin to find, in ontogenesis, in the transition to dual semiosis.

In Vygotsky's account of ontogenesis, two threads of development contribute to the emerging relationship between language and thought. One is a social thread of noncognitive speech, and the other a natural thread of nonlinguistic thought. When the two meet, speech gains a cognitive basis, and thought a linguistic one (although this does not apply to all language or all thought). The social aspects of Vygotsky's (1978, 1987) account, as reflected in the often-quoted passage below, are well-known. Inner speech and thought arise on a social plane; over many years external speech is internalized, through a long series of "developmental events."

[T]he process of internalization consists of a series of transformations:

(a) *An operation that initially represents an external activity is reconstructed and begins to occur internally*...
(b) *An interpersonal process is transformed into an intrapersonal one*. Every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, *between* people (*interpsychological*), and then *inside* the child (*intrapsychological*)...
(c) *The transformation of an interpersonal process into an intrapersonal one is the result of a long series of developmental events*. The process being transformed continues to exist and to change as an external form of activity for a long time before definitively turning inward (Vygotsky, 1978, pp. 56–57).

In recent years, much has been written on language development from this perspective. An early example is Weir's (1962) seminal analysis of her two-year-old son's crib talk. Weir cast her analysis in a Vygotskian light, describing Anthony's monologues as tokens of egocentric speech, mediating the transition from external to inner speech. The passage in (1) illustrates the metalinguistic nature of Anthony's productions; how they serve, as Jakobson

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(1962) put it, as "self-educational linguistic games." Observe the contrastive alternations between different nouns ("Daddy put on a hat," "Daddy put on a coat"), the presence and absence of an adverb ("see the doggie here," "see the doggie"), and the absence and then presence of the first-person pronoun ("see the doggie," "I see the doggie").

(1)   Daddy dance
        Ah, Daddy
        Take it to Daddy
        Daddy put on a hat
        Daddy put on a coat
        Only Daddy can
        I put this in here
        See the doggie here
        See the doggie
        I see the doggie (2x)
        Kitty likes doggie
        Lights up here
        Daddy dance (3x)
        With Bobo
        What color's Bobo (from Weir, 1962, p. 139)

Less well-known than the social aspects of Vygotsky's theory is his view of a second, natural thread of development that merges with the social. While the first perspective has generated much study, the pictorial, imagistic aspects of language development have been largely overlooked. Jakobson (1962) hints at their presence in his remarks on Anthony's "dream-like" productions. Commenting on the larger passage from which the passage in (1) is taken, Jakobson remarks that, with its "recurring leitmotiv, 'Daddy dance'. . .it is a true and beautiful poetic composition tantamount to the masterpieces of infant art – *verbal and pictorial*" (p. 20, italics added).

In this book we take up the merging of the two developmental threads, the social, as in Weir's study, and the natural, especially the pictorial, imagistic thread which Jakobson observed. Gestures are a *natural material image*, and from this perspective the gesture is the meaning, not an "expression" or "representation" of it, but *is* it. We will view imagery as *part of language*; and our account of narrative development will then address the co-contribution of the imagery embodied in gestures and the lexicogrammatical categories of speech.

The influence of Werner and Kaplan

Our pursuit of the imagistic thread of development is influenced not only by the work of Vygotsky, but by Werner and Kaplan's studies as well. At the core of their approach is the embodiment of language. In their view, symbol

Table 1.1 *Objects-of-cognition: diagram of developmental transformations (from Werner and Kaplan, 1963)*

Organism–Umwelt relationships			Means–ends relationships
I. Tropistic-reflex reactions	*to*	Stimuli	Biophysical and biochemical transmission culminating in stereotyped reaction patterns of parts of, or whole organism.
II. Goal-directed sensory-motor action	*upon*	Signaled things	Species-specific behaviors and individually learned patterns of response ("habits"); formation of signals (mammals); "natural" tool usage (apes); all predominantly in the service of biological ends.
III. Contemplative knowledge	*about*	Objects	Construction of tools and formation of symbols in the service of knowing about and manipulating the environment.

formation consists of *dynamic schematizing activities* whose outcome (in part) is the transformation of *things-of-action* to *objects-of-cognition*. This is to be understood in the context of a phylogenetic argument of the changing nature of transactions between an organism and its environment (its "milieu" or "Umwelt"), summarized in Table 1.1:

Whereas more primitive organisms. . .are directed predominantly toward the satisfaction of biological ends, in higher organisms, ends of a quite different order come into play; in man especially such novel, emergent functions are clearly manifested. Among the novel ends immanent in the nature of the developing human being. . .is that of *knowing* about his world. This end plays an intrinsic role in man's transformation of his milieus into objects to be cognized and conceptualized. Indeed this end is so strong in man that even in the absence of certain normally employed instrumentalities of cognition (for example, sight and hearing), man may use alternative, compensatory means for attaining knowledge (Werner and Kaplan, 1963, p. 10).

This view of human development – of the driving force of an inborn need to know (a "basic directiveness toward knowing") – has parallels in sociocultural accounts of "meaning-making" (Bruner, 1990). A difference is the emphasis placed on the embodiment of meaning. Recalling Werner's seminars on language development at Clark University, Glick (1983) remarks that "an important distinction. . .kept reemerging"; this was Humboldt's distinction between language as *Ergon* – language viewed as structure – and as *Energaia* – language as an "embodied moment of meaning located both in the organism and in the medium that the organism uses for expression." The latter is *language at the moment of its use*, "alive, in an actor" (Glick, 1983, p. 48). For Werner and Kaplan, utterances begin in an embodied moment, and progress through dynamic schematizing activities toward "true" grammatical constructions.

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Dynamic schematization transforms activities "interwoven with gross bodily gestures" – affective, postural and imagistic elements – to autonomous symbols. Thus it is out of embodied processes that symbols arise.

A core function of human ontogenesis is learning to construct symbols; thereafter, the child and then adult "[live] constantly in a world of becoming rather than in a world of being."

[I]n order to build up a truly human universe, that is, a world that is known rather than merely reacted to, man requires a new tool – an instrumentality that is suited for, and enables the realization of, those operations constituting the activity of knowing. This instrumentality is the *symbol* (Werner and Kaplan, 1963, p. 13).

Werner and Kaplan's account is of great relevance to the present approach. In their view, symbol formation *consists of the creation of referents* as well as symbolic vehicles; and referents can correspond to a single word, a proposition, or a combination of propositions. With respect to the last, Werner and Kaplan recognized the importance of one type of cohesive device – clausal connectives – in the development of language and thought. They viewed connectives as of great value because they allow children to construct different types of relationships between experienced events:

[The value of connectives] for thought and communication lies in the fact that they manifestly serve to *polarize* two events (or thoughts), while *uniting* the polarized moments in an integrated utterance. Whereas in complex utterances lacking the full explication of relationships via form-words the component parts of an utterance are knit together only through the concrete context in which they are embedded or through intonational patterning, here the conceptualized events become more clearly segregated and self-contained and yet are shown as clearly linked to each other in specific ways (Werner and Kaplan, 1963, p. 179).

If we view narratives as the unfolding of utterances, one after the other along the dynamic dimension of speaking – as sequences of *utterance pairs* – then Werner and Kaplan's account can accommodate large segments of discourse. Deacon (1997) has described entire discourse units as products of complex, "large-scale" symbol formation: "the larger symbolic constructions that words and sentences contribute to: complex ideas, descriptions, narratives, and arguments." In Deacon's words, "construction and analysis do not end with a sentence, but in many regards begin there. The real power of symbolic communication lies in its creative and constructive power" (p. 312). Our goal is to uncover details of how this "creative and constructive power" emerges in children.

The importance of cohesion in large-scale symbol formation

Developing this line of thought, we will argue that the formation of complex symbols requires the use of cohesive devices. We concentrate on two classes

of cohesive devices, clausal connectives and referring expressions, and how narrators use them to control patterns of information flow (Hickmann, 2003). The example in (2), from an adult's retelling of an animated cartoon, points toward the complexity of this function in ongoing discourse. Here we can see that the narrator uses different types of referring expressions (italicized) to refer to the two animate characters in the episode. The first two references to characters ("he$_1$" and "Tweety Bird") illustrate the narrator's use of a fundamental discourse pattern, pronouns referring to more presupposed characters, and more explicit forms to characters that are less highly presupposed. Givón (1985) describes this distinction as a continuum: The amount of linguistic material decreases when what is being referred to is more continuous/predictable/accessible; in other words when it is more highly presupposed relative to earlier discourse. In (2), the narrator has been describing an episode in which one character, Sylvester, makes repeated attempts to climb a drainpipe, and the first pronoun ("he$_1$") is a reference to that character. The use of the pronoun reflects that its referent is highly presupposed at that point in the story. The next animate referring expression, "Tweety Bird," refers to a different character, and so a more explicit expression is used.

(2)   *he$_1$* tries going up the inside of the drainpipe, and *Tweety Bird* runs and gets a bowling ball and drops it down the drainpipe, and as he$_2$'s coming up and the bowling ball's coming down *he$_3$* ssswallows it.

The second animate pronoun, "he$_2$," appears at first to break the pattern of Givón's principle – its referent is different from the one that preceded it, yet a highly presupposing form is used. If we look to a more global level of discourse, however, we can see that the pattern is maintained. The episode is about Sylvester's actions, and at this global level this character remains the most highly presupposed. Karmiloff-Smith (1979) refers to the influence of such global properties of discourse as a "thematic subject constraint." What we are suggesting is that the speaker in (2) is manipulating Givón's continuum to maintain higher-order relationships in her narration, and that the relationship between linguistic form, on the one hand, and global discourse function, on the other, contributes to complex symbol formation. In this light, the pronoun ("he$_2$") is not merely a reflection of what has come before, but is an active signal that the pronoun's referent continues to be highly presupposed, the "thematic" character of the episode. In this way, the speaker's choice of referring expression contributes to the global coherence of the story (Levy and McNeill, 1992).

We used this example to suggest some complexities involved, as narrations unfold along the dynamic dimension, when referring expressions signal how presupposed their referents are at the moment of their use. From a larger

perspective, cohesive devices participate in a broader pattern: they contribute to the discourse function of the *entire utterance* in which they occur. As a narration unfolds over time, each next utterance not only looks back, but looks forward as well, contributing *newsworthy* information, and so helps "push the communication further forward" – conveying what the Prague school linguists called "communicative dynamism" (Daneš, 1974; Firbas, 1971). Hereafter we will refer to the combined backward- and forward-looking function of utterances as the *dynamic function of utterances in discourse*, and we will use it to portray our core perspective on the unfolding of discourse over time: the integration of each utterance with context, and simultaneous differentiation from it. This was captured in Vygotsky's notion of the psychological predicate: psychological predicates imply the immediate context as background (integration) and mark significant departures from it (differentiation). Vygotsky had several ways of describing the incorporation of discourse context, and in this book we will adopt a term we find especially conducive to describing change along the dynamic dimension: that is, the notion of the "infusion of sense" – an *enrichment* of "the word through the sense it acquires in context" (Vygotsky, 1987, p. 276). In this light, as the passage in (2) unfolds in time, each utterance is infused with the sense of what came before – and still pushes the narrative further forward. It is from this perspective that we approach narrative development.

Gestures, cohesion, and the dynamic function of utterances in discourse

A core part of our proposal is that gestures play a central role in realizing the dynamic function of utterances in discourse (McNeill, 2005, 2012; McNeill and Levy, 1993). This is illustrated by the passage in (3), a reproduction of (2), but with gestures added. We use this example to illustrate the proposed role of gestures, first, in simple cohesion, and then, in the dynamic function of utterances more broadly.

(3.1)   he tries going **[[up]** [the in**sid**][e of **the drain**pipe #]] and
         one hand: right hand rises up three times with the first finger extended

(3.2)   Tweety Bird runs and gets a bowling ba[ll and drops **it do**wn the
         drainpipe (pause)]
         symmetrical: two similar hands move down

(3.3)   [and (pause) as **he's** co<u>ming</u> **u**p]
         asymmetrical: two different hands, left hand holds, right hand up two times

(3.4)   [and the **bowling b**all's coming d]
         asymmetrical: two different hands, right hand holds, left hand down

(3.5)   [own he **sssw**allows it]
         asymmetrical: two different hands, left hand down into hollow space formed
         by right hand[1]

First, the locally underdetermined pronoun, "he" in (3.3), highlights the proposed contribution of gesture to cohesion. Both the reference in (3.3) and its precursor in (3.1) are accompanied by right-handed gestures moving in an upward trajectory, and we suggest that the recurring features of handedness and motion *help to keep reference straight*. In this way, gesture helps maintain reference that relies on presuppositions created in earlier discourse, the essence of cohesion. This example shows how gestures can realize, at the same moment, both continuity and change, and in this sense help speakers to link spoken utterances using the devices of cohesion, such as pronouns – and thus help to make distinctions between thematic and non-thematic characters.

Then, the gesture in (3.5) illustrates the proposed role of gestures in the dynamic function of utterances more broadly. Here, the narrator continues to use her right hand to embody the actions of Sylvester. This gesture helps to keep reference straight, while *at the same time* helping to present new information: the right hand maintains continuity to Sylvester, but at the same time it changes shape, embodying a different action (not going up the drain-pipe, but swallowing the bowling ball), as the narrative continues to be pushed forward. Thus the gesture contributes to the presentation of newsworthy information, helping to create a differentiation from context while also maintaining continuity with it, and thus helping to integrate the utterance with context. This is a contribution made by the global synthetic property of the gesture: in a single gesture, handedness contributes to continuity with context (same character), and shape to change (different activity).

This example leads us to our central proposal: that the development of coherence in children's narrations also relies on gesture. Werner and Kaplan's concept of a complex symbol we enlarge further to show that all we have mentioned – cohesive devices, toolkits, complex symbols themselves – arise in answer to a child's growing sense of coherence: each adds to it and is acquired as the child feels the presence of it. Our main theoretical contribution

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[1] What Kendon (1980) called the gesture phrase – one complete "manifestly expressive action" – is enclosed within "[" and "]." In any gesture phrase there are up to five distinguishable phases. Not all phases need be present, but one or more **strokes**, the image-bearing phase, marked in bold, is obligatory; without a stroke a gesture is not said to have occurred. The **preparation** phase is the hand getting into position to make the stroke and is indicated by the span from the left bracket to the start of the bold stroke. The preparation shows that the gesture is coming into being. <u>**Holds**</u> are cessations of movement, either a pre-stroke, the hand frozen awaiting the stroke, or a post-stroke, the hand frozen in the stroke's position and hand shape, even though movement has ceased. Holds of either kind are indicated with underlining. "#" indicates an audible pause; silent pauses are marked in parentheses (pause); and repeated letters are a filled pause.

is to elucidate how gesture and linguistic form together figure in the development of this sense. We present evidence that children begin to acquire the mechanisms of cohesion in their spontaneous narratives from a very young age – between two and three – and we suggest that they soon use cohesive devices in their narrations to further the coherence of their thinking. Underlying the use of cohesive devices is gesture imagery, part of Vygotsky's "natural" thread of development, and this merges with social influences, especially discourse patterns borrowed from adult speech and appropriated through the types of contrastive alternations we observed in Anthony's crib talk in (1). Together the social and natural threads of development point toward a context-dependent, embodied account of the early emergence of cohesion, and its use by children to produce coherent descriptions of events, that is, coherent narratives.

The structure of the book

The themes of social and natural influences on cohesion are built into the structure of the book. It is divided into three parts: "Narratives as symbol formation," "Social sources of cohesion," and "Gestures, cohesion, and narrative development."

Part I, "Narratives as symbol formation," provides a foundation for later parts of the book. It consists of two chapters. In **Chapter 2**, "Narratives, cohesion, and symbol formation," we outline a general semiotic approach to narrative development as large-scale symbol formation. Here, we lay out the argument that the formation of complex symbols requires the use of cohesive or *intralinguistic* devices – devices that link utterance to utterance in discourse. The focus is on two classes of cohesive devices identified by Halliday and Hasan (1976) – referring expressions and connectives. The hallmark of cohesion is a reliance on presuppositions generated in earlier discourse, and, following Givón (1985), we order referring expressions and connectives on a continuum of how presupposing they are of earlier context. From this perspective, we argue that, all other things being equal, discourse that contains the most presupposing cohesive devices – the "tightest clause linkage" – corresponds to the greatest narrative coherence. In ontogenesis, we propose, children progress along a trajectory of narrative change, toward increasingly tight clause linkage and, correspondingly, greater narrative coherence. Progress along the trajectory is guided, in large part, by conventional narrative genres. In this way, as Vygotsky (1987) put it, adults "predetermine" the path of children's narrative development toward increasing generalization of original perceived experience. Most studies of narrative development have focused on children over the age of four or five, so our strategy is to outline our account first with respect to older children and adults, and then to show its application to the period from two to three, the focus of Parts II and III.