

Language, Knowledge and Pedagogy

**Functional Linguistic and
Sociological Perspectives**

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7 Language for learning in early childhood

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Basil Bernstein (1999) has described as 'horizontal discourse' the forms and uses of language that realize the particular form of knowledge he characterizes as 'common-sense' in character. Such knowledge stands in contrast to specialized and institutional forms of knowledge accessible only via specialist or 'vertical' forms of discourse. It is common (sense) in being accessible to all, in applying to all and in 'arising out of common problems of living and dying' (Bernstein 1999: 159). Following from this, the most obvious case of the construction of common-sense knowledge must be in an individual's very early life, where the child learns how to manage the routines of everyday life, and builds up the skills and information that is common to all members of that community. It is therefore in the informal pedagogic contexts and processes of the home, family and peer group that the nature of horizontal discourse may perhaps best be exemplified. In this chapter, I shall use data from informal conversations in the home between parent and child to provide such exemplification with a threefold aim. One goal will be to clarify the pedagogical and linguistic nature of horizontal discourse, a second will be to show how the discourse can change over time in the process of construing the world, while a third will be to demonstrate its essential limitations for the developing child straining to gain information beyond everyday experience.

The data on which I shall base my discussion come from longitudinal studies of the language development of my own sons, Hal and Stephen. Data from the elder child, Hal, was collected up to the age of thirty months and from his brother ($4\frac{1}{2}$ years younger) from thirty months to five years. In each case, a naturalistic methodology was adopted whereby spontaneously occurring conversations of up to 45 minutes' duration were audio-taped at least once a week, supplemented on a more frequent basis by the pen and paper recording of novel utterances, brief conversational exchanges and contextual information. At no point were the children tested; nor were situations deliberately contrived in the process of data collection, and the children remained unaware throughout that their language was under any scrutiny. The aim was to collect material that reflected as accurately as possible spontaneous and unselfconscious conversations between family members. (See Painter 1984, 1999, for further details and discussion of data collection methods.) It should be noted that the children's family is one in which an 'elaborated' coding orientation predominates (Bernstein 1987) so that the forms of horizontal discourse described are those most likely to harmonize with later forms of vertical discourse. At the same time, the data described can support the very general principle that for any child, as language develops and new forms of knowledge are confronted, both

pedagogy and language use will necessarily be subject to change. Moreover it is possible that an elaborated coding orientation will put horizontal discourse under earlier pressure in the child's life, and thus amplify its nature and limitations.

To pursue these points, the remainder of this chapter will be organized into three sections. The first will very briefly outline the systemic-functional orientation to language and learning that underpins the case-study research. The second will describe and exemplify Bernstein's notion of horizontal discourse using data from the first case study. The third section will use data from the second case study to focus on problems encountered by the child in the continuing construal of everyday knowledge when using the linguistic resources and forms of discourse typical of the first two or three years of life. It will be suggested that in meeting these challenges, the child's language comes under pressure to develop in ways that provide greater potential for accessing less common-sense forms of knowledge. In the process, there are indications of the limitations of horizontal discourse for building these new forms of knowledge.

Language and learning: the centrality of dialogue

The orientation towards language and learning taken here is best summarized by M.A.K. Halliday's claim that there are three aspects to learning one's mother tongue: learning language, learning through language, and learning about language. In a classic paper, Halliday (1980/2004) emphasizes that these are in fact three different facets of the *same* process: as a child learns the language, so he or she construes the social and informational knowledge that is realized in language, including knowledge of language itself. To study the individual's development of language, then, is necessarily to study the development of knowledge (construction). The notion that learning language is at the same time a matter of learning (other things) **through** language clearly resonates with Bernstein's statement that 'horizontal discourse, in its *acquisition*, is the major cultural relay' (1999, p. 160). However, Halliday prefers to speak of development or learning rather than acquisition, since to speak of language or its usage as something that is 'acquired' can suggest that it is something finite, monolithic and unchanging rather than being – as Halliday would view it – an infinite variable, dynamic resource, constructed and maintained interactively.

The interactive construction of language is supported by psychological research into the very beginnings of life and semiotic experience. According to neonatal researchers such as Trevarthen (1992), Bateson (1975), Meltzoff and Moore (1998), and others, it is emotional empathy between mother and baby that provides the basis for all later developments. This is evident not only in infants' displayed innate preference for attending to people over other stimuli (Field and Fox 1985; Messer 1994), but in their **pre**-linguistic communicative exchanges. We now know that well before language – indeed as early as the second month of life – infants exchange attention with care-givers, using gaze, facial, vocal and bodily movements in emotionally charged encounters with other persons. In these encounters, 'complex, well-organized repertoires of

action and facial expression are displayed that appear responsive to the form and timing of adult communication' (Murray 1998: 127). In other words there is a 'precise interplay of address and reply in time' (Trevarthen 1992: 108) being achieved between infant and care-giver (see further Bateson 1975; Trevarthen 1977, 1998). It appears then that dialogic exchange is at the heart of human experience (and human learning).

It is not only the human world that attracts the child's attention of course, and after a few months the infant directs reaching and grasping movements towards inanimate objects in the environment. Halliday (2004) has suggested that the attention to objects and other external phenomena creates a kind of puzzle for the child in that what is 'out there' in the world beyond impinges (when seen and touched and reacted to) on what is 'in here' – the world of the infant's consciousness. But the infant's consciousness is a world that has already begun to be set up as a social domain of 'you and me'. Certainly there is evidence from developmental psychology to suggest that there may for a time be a competition between the infant's fascination with the world of objects and events (to which reaching movements are directed) and his or her engagement with other persons (where attention is coordinated) (Trevarthen 1987: 191). This conflict between the claims of the material and social worlds is resolved when the child is able to extend the dialogic exchange to include reference to the world beyond the interpersonal dyad. This occurs from around nine months of age when a child can achieve **joint** attention to objects or happenings in the environment by creating an idiosyncratic vocal or gestural sign with which to address the other person. This is the 'proto-language' phase of language development documented in Halliday (1975/2004), Painter (1984, 2005) and Torr (1997). It can be exemplified by the following two examples from Hal (H) as a baby in interaction with his mother (M) and father (F). Here and throughout this chapter the age of the child is given in years, months and days following the text example.

Example 1

- H: (reaching to biscuit tin) amamama'ma [gloss 'I want that, give it to me']
 M: Okay you can have one. (opening lid)
 H: amamama'ma
 (M hands over biscuit) (0;9;12)

Example 2

- H: (playing with hairbrush, touches bristles to hair) a'da
 H: (Looks up at F and brandishes brush) a'da!
 F: (smiles at H)
 H: (looks across at M and holds brush aloft) a'da!
 M: (smiles) Yes you've got a brush for your hair; is that fun? (1;1;1)

We can see here that through the use of a sign, some phenomenon external to the dialogue – some phenomenon from the 'objective' domain of experience – is brought into the intersubjective context of mutual address. In this way engagement with the world beyond the speaking interactants begins to be

mediated through other people. Thus even at this proto-language stage, objective reality comes to be acted on, but also reflected on, or 'known' through symbolic interaction, not through private cognitive apprehension. This means that the orthodox psycholinguistic position that language is 'a system of expression' designed 'for taking the internal, personal, private mental meanings of individuals and making them external and public' (Bloom 1993: 19) is simply not tenable. Instead we must acknowledge that symbols arise in the context of dialogue – not as an externalizing of the private inner, as Bloom suggests, but as a way of making sure that the inner is developed socially and that the world outside the child comes to be known through the mediation of symbols. This is an orientation entirely in harmony with Bernstein's emphasis on the centrality of dialogue in the construction of identity and consciousness.

With an orientation of this kind, it is evident that the child develops proto-language and then language in the course of **using** it to make meanings with others. And the fact that at the same time as the system of language is built up – and the child is learning how to form questions and answers, how to indicate past and present time, how to make causal or contrastive connections, how to refer to self, addressee and third parties through the pronoun system, and so on – at the same time as all the various features of the grammar are being constructed, the child is experiencing these features, not as abstract paradigms, but as ways to realize meaning on particular occasions of use with particular other persons.

This can be readily demonstrated if we skip ahead in the developmental story to the point where the child is first learning words, and the knowledge they instantiate, as seen in Example 3 below:

Example 3

(H is naming different animals in a picture book about a train ride)

H: Bukkersefy; nother bukkersefy.

M: Butterfly; butterfly.

H: Butterfly. It's got horns.

M: No, they're not horns, they- they-

H: (turns page and points at horse) It's got horns.

M: It's got ears.

H: (points at rabbit) It's got horns.

M: No, it's a rabbit! It's got ears; big ears.

H: (points at squirrel's tail curved behind its head) It's got horns.

M: It hasn't; it's got a tail; it's a squirrel. This one's [=cow] got horns.

H: It's got horns.

M: Yeah. (turns page)

H: Doggy.

M: (points at train and makes *choo choo* train noises)

H: (points at lion) Lion. (makes growly noises)

M: Lion. And where's the lion?

H: (sees cat and climbs off lap) Katy, Katy.

M: No, leave her; you're reading a book with Mummy.

H: Hal stroke Katy; Hal stroke Katy; stroke Katy.

M: Now you stroke her gently. (1;11;18)

It is clear that Hal is here learning language. But it is equally clear that in the process he is doing more. He is also construing knowledge about animals and their body parts, he is enacting (and thus learning to engage in) a particular social relationship with the mother and also gaining experience in the social process (or 'genre') of bedtime book reading. He is learning all these things through linguistic interaction at the same time as he is learning the words and structures of the language itself. A Hallidayan perspective on language development, then, is one that sees learning through language as an inextricable part of the process of learning the language itself.

The characteristics of horizontal discourse in the first two and a half years

Bernstein describes the kind of knowledge realized in horizontal discourse as being typically 'oral, local, context dependent and specific, tacit, multi-layered, contradictory across but not within contexts' and, most crucially, 'segmentally organised' (1999: 159). In this section a further small selection of texts from Hal's early childhood will be used to illustrate some of these points and to discuss the kind of pedagogy and the forms of language involved. Each text cited is representative of dozens of comparable ones that share the same features. In presenting examples I will focus initially on the variable nature of pedagogy in horizontal discourse of this kind, which is said by Bernstein to vary from 'segment' to 'segment.'

For example, there are occasions when the pedagogy is quite explicit: that is to say both parties know what is to be learned, how it is to happen, who is teacher and who is taught, and what counts as success. This is most obvious when the child is being instructed in a specific skill, as exemplified in Examples 4a, b and c.

Example 4a

(M instructs Hal how to pull elastic for cat to chase)

H: Katy, Katy. (pushes a bundle of elastic tape at her)

M: No, she likes it when it moves; it's got to move, you see.

H: There you are Katy.

M: No, she won't take it like that. Come here and I'll show you. You hold this here; hold it there; and then you dangle this bit like that; like that; and then you say 'Here you are Katy'.

H: Here Katy! Here Katy!

M: Just throw this and wheeeee! (tosses elastic) Chase it Katy!

(H runs up to cat)

M: No, she's a bit frightened of you. (2;3;25)

Example 4b

(M instructing H to buckle up sandal)

M: Pull up; pull it up; that's a good boy. No, got to pull it up some more. That's it. Pull it hard as you can. That's the way. Now put this [=metal prong on buckle] in. Good boy! Want to put this [=end of strap] in? Let

me start it and then you can push it in. That's the way! Oh, you're a clever little boy aren't you? (2;3;25)

Example 4c

(H treads heavily on M's toe, while Grandmother (G) observes)

M: Ow!!! (crossly) Oh Hal, be careful!

G: It was an accident.

H: Sorry Mummy.

M: Darling. (kisses)

(M and G talk)

H: I tread on Penny too.

M: You trod on Penny. Did you say sorry to Penny?

H: No I didn't.

M: Did Penny shout at you?

H: No; she say 'Ow!'

M: Well, next time say 'Sorry Penny'. (2;6;16)

While the pedagogy is explicit in relation to the physical or social skills being taught in each case, it should also be noted that there is tacit learning taking place here. Neither party is conscious for example that such conversations are also teaching the child that the appropriate way to learn new skills is through talk (rather than say simply by observation), which is something that we know varies from one social group to another and has consequence for the transition into school (see Heath, 1983). What is also tacitly conveyed of course is that a pet cat is a possible playmate whose feelings have to be taken into account; that managing your own dressing is a praiseworthy goal and that apologies defuse anger and deflect criticism.

As well as the tacit knowledge that is gained incidentally during instances of explicit pedagogy, there are many occasions where the instruction is itself implicit: that is to say, the learner is unaware of the goal of the lesson or the route to its achievement. Here we can consider text 5, which is typical of those that took place before age 2 when Hal's father returned home from work:

Example 5

M: Tell Daddy where we went today.

H: (looks at M)

M: Where did we go, Hal?

H: Park.

M: What did we do?

H: Play football in park.

M: Mm, we played football; it was fun, wasn't it? (1;8;1)

Here, through modelling, there is implicit teaching of aspects of grammar in the mother's elaborated final response; for example of the past tense of *play* and the use of the subject pronoun *we*. In addition, through the use of questioning and elaborated responses Hal's mother is also implicitly teaching him how to structure a recount of experience. Even more importantly, such an exchange

demonstrates to the child that language can be used to convey information to someone who didn't share the experience, a realization that may take some time for a young child to appreciate. (At first, as here, the child may only understand that it is possible to re-share in language an experience that was shared in the first place, rather than reporting to a third party. See Halliday 1975; Painter 1984, for further discussion.) Such conversations, even without the adult being conscious of the fact, alert the child to the potential of language for true information-giving and also to the kind of information (and its attitudinal appraisal) that it is appropriate to share when a family member returns to the home.

On still other occasions of horizontal discourse, the pedagogy may be further submerged. That is to say, neither party may even be conscious of the discourse as having any informative or instructive character. Text 6 exemplifies:

Example 6

(M and F have entered kitchen with H mid-morning to make coffee)

M: (to F) Kettle's boiling.

H: I want my lamb chop Mummy.

M: Um it's a little bit early for lamb chops darling; would you like to have half a banana?

H: No no no no! A *big* banana!

M: All right; you get one from up there. (indicating fruit bowl on counter)

H: Can't.

M: Yes you can.

H: (moves chair to reach) There! (2;6;0)

Even though the context here appears to the interactants to be one of action rather than teaching and learning, the contributions by the mother incidentally convey cultural information about when it is appropriate to eat which kind of food, as well as the fact that acting independently is valued in their social group.

Another and very different context for tacit learning is provided by playful interactions. Text 7 below is one of very many examples in the corpus where parent and child collaborate in a 'misnaming' game, initially introduced to the child by the adult. It too looks at first to be a poor example of a pedagogic text, but is again significant for the tacit understandings gained or rehearsed:

Example 7

(Looking at picture book which displays a picture of a tiger and of an elephant)

M: Which one d'you like best? The tiger or the elephant?

H: (points at tiger) That's tiger.

M: (confirming) That's the tiger.

H: (points at elephant) Tiger!

M: (laughs)

H: No.

M: That's not a tiger; that's a gorilla.

H: No!

M: It's a giraffe.

- H: No!
 M: That's a deer.
 H: No!
 M: That's a zebra.
 H: No.
 M: What is it?
 H: Some more zebra? [i.e. request to continue misnaming]
 M: (laughing) That's . . . what is it?
 H: Pussy cat!
 M: Pussy cat, is it? miaow!
 H: No.
 M: Is it a donkey?
 H: No.
 M: Is it a giraffe? . . .
 [further exchanges omitted as they cycle through six further wrong names]
 M: Is it an elephant?
 H: Yes!
 M: Yes! (2;1;27)

Since the child is well aware of the words *tiger* and *elephant* and to which animals they refer, this is not an explicitly pedagogic text in the sense of being instructional or informative in the same way as Example 3. And as far as the interactants are concerned, the object is simply playful enjoyment. But tacitly, the child is learning here about the possibility of unhinging meaning and wording. This, it can be argued, constitutes the first step towards a more conscious understanding that a name is a social symbol and that knowledge itself is a representation and therefore can be misrepresented.

Summary: horizontal discourse up to age two and a half

From these very few examples cited from the much larger corpus we can get a better sense of what Bernstein intends by the term horizontal discourse. In particular, the following characteristics are prominent.

First of all, we can see that each fragment of conversation is, in a certain sense, self-contained. That is, the skills or knowledge gained in one episode aren't required before the learner can tackle something new. It is not necessary for example to have mastered shoe buckling before learning to apologize; it is not necessary to have mastered the difference between horns and antennae before being able to play a misnaming game in relation to elephants and tigers. This quality of the learning encounters is a key feature of what Bernstein refers to as the 'segmental organization' of horizontal discourse.

Two further features associated with this segmental organization are the context-specific nature of the knowledge being learned, and the fact that learning is a matter of repeating or accumulating successive instances. Learning is context-specific due to the isolation of segments from one another and the lack of explicit provision of more generalized information. For example, Hal is instructed in what to say when treading on someone's toe rather than being provided with an account of intentional and accidental behaviour as a basis for

the application of general moral rules. At the same time, the segmented, context-specific organization means that a key feature of horizontal discourse is that learning takes place by continually accumulating or repeating instances, whether it be of buckling a shoe, practising a name or relating news.

A fourth feature of horizontal discourse that Bernstein draws attention to is that the success of any segment is inherent in the specific occasion. Whether it is a meaning or a physical accomplishment that is being essayed, the child does not need to be told by someone else whether s/he has succeeded or failed. Whether or not Hal received praise, he knew whether the shoe got done up or whether the apology worked or whether he got a banana, or whether he figured out to his satisfaction the difference between ears and horns.

Fifthly, there is the question of the tacit nature of many of the understandings construed through horizontal discourse. The data show clearly that the nature of the teaching and learning may be more or less explicit on different occasions. However, it is also clear that even where the pedagogic intention is explicitly directed at a particular goal, there will be other tacit learning going on. Moreover, it is the combination of segmental organization and tacit learning that makes it possible for contradictory or inconsistent knowledge to be held relatively unproblematically. This means, for example, it can be taken for granted in one segment that one small animal can be a playmate and family member whose affects are important, and in another segment that another animal can be a commodity for consumption.

Finally, when it comes to a consideration of the language drawn on in horizontal discourse at this time, two additional and related features are important: one is the context-bound nature of the language, and the other is that the meanings all pertain to concrete experience. The characteristic of context-dependence relates to the fact that the language of a child under three will generally either accompany/request action in the immediate context (e.g. texts 4a, 4b and 6), provide a commentary on the shared visual context (e.g. texts 3 and 7), or reconstruct a recalled context (as in texts 4c and 5). The meanings are 'concrete' in that they relate to the observable and tangible rather than the general or abstract. As will be shown in the next section, these are limitations that begin to be transcended after about age 3.

All the general characteristics of horizontal discourse summarized above have been observed by Bernstein (1999), and are likely to be common features of any child's early language use. What is worth emphasizing though is that despite the segmental nature of horizontal discourse, there are aspects which cut across the boundaries of segments. I would suggest that the more tacit aspects – like the value of language to mediate physical learning (as seen in e.g. 4a and 4b), the potential to unhinge meaning and form (apparent in the misnaming game), and the value of being linguistically explicit and of conveying unshared information to others – are actually relevant **across** different segments. And it is these particular tacit aspects that may be specific features of elaborated code users. So even at this early stage, there are likely to be differences in the nature of horizontal discourse in different social groups.

Problems and resolutions: developments in the linguistic system and its use after age three

So far, I have exemplified the characteristics of horizontal discourse typical of a child's use of language up to the age of about 3 years. Now I wish to consider the limitations of this kind of discourse for construing knowledge. One way to address this is to look at examples of talk where the child appears to struggle with meaning or to get things wrong. This throws light on the limitations of the language and also the aspects of knowledge that prove problematic. In this section, therefore, I shall identify moments from the second case study where Stephen has difficulty with construing common-sense knowledge, and outline the new developments in his linguistic system and its use that follow from these. (In these examples, because the child seeks help in construing his world, the pedagogy is more consistently of a relatively explicit kind, although of course many other conversations had a different character.) The developments described involve on the one hand a move away from the necessity of context-dependence and specificity, and on the other a movement towards more abstract meanings and a greater reliance on attention to textual rather than purely observational information sources. New linguistic resources and new possibilities for discourse will be shown to equip the child to gain glimpses of educational knowledge, but the lack of technicality, and the unsystematic and incidental character of learning through conversation, limit the child's access to such knowledge.

Problem 1: Limitations of 'context-bound' talk and observation for building semantic taxonomies

In Examples 8a and 8b below, Stephen experienced difficulties tracking information that was detached from the observational context, and in organizing names of everyday things into semantic hierarchies.

Example 8a

(M and S's brother have used the term *pet* in their talk together)

S: (having overheard) What's a pet?

M: A pet is an animal who lives in your house; Katy's our pet.

(later same day)

S: What's a pet called? (2;11;15)

Example 8a above is still very much in the realm of common-sense knowledge relevant to the domestic sphere, but the use of language by the parent is different. It is different from other texts where things are named in being no longer context-dependent. Instead of pointing (linguistically and physically) at something directly observable in the context by saying *that's a pet*, Mum offers Stephen a definition (*a pet is an animal who lives in your house*); in other words, both terms in the relationship $X = Y$ are constructed in a linguistic form that holds good regardless of the context of situation. Such a form can be termed 'self-contextualized'. The difference between the two forms is set out below in Figures 7.1 and 7.2:

<i>that</i>	<i>is</i>	<i>a pet</i>
reference to material entity	relator	name/category

Figure 7.1 Context-bound language for categorizing

<i>a pet</i>	<i>is</i>	<i>an animal who lives in your house</i>
name/category	relator	category

Figure 7.2 'Self-contextualised' language for categorizing

Because Stephen was used to learning categories through contextually supported language and not by processing definitions, he had difficulty with his mother's statement and so he returned to the issue again later in the day, asking *what's a pet called?* At this time *call* was Stephen's only metalinguistic verb and his apparently inappropriate use of it here was doubtless an attempt to use his current linguistic resources to make the new move to talking about meaning rather than talking directly about observable reality.

We see the same problem arising in Example 8b:

Example 8b

(Traffic passes in the street where S and M are walking)

S: A bus isn't a truck, is it Mum?

M: No.

S: What is it?

M: A bus is for carrying people.

S: No, what is a bus called? I said, a bus, what is it called?

M: It's called a bus; that thing (points) is just a bus and it's -

S: (plaintively) Oh, why is it just a bus? (3;6;25)

In Example 8b, Stephen wanted a superordinate term in order to better understand the relationship between buses and trucks, but his mother failed to recognize this. As his enquiry was about names and categories, Stephen attempted to reframe it by using his only metalinguistic verb (in *what is it called?*), but failed to make himself understood.

From grappling with these problems of categorization, Stephen was impelled to develop his own language further, and to learn in a less context-bound mode. He took up the metalinguistic verb *mean* and the use of self-contextualized defining and classifying clauses, together with reference to generic categories. In Examples 9 and 10 below, it is apparent that using this kind of language has advantages for extending knowledge both more quickly, and beyond here-and-

now experience: it shortcuts learning by discussing meanings rather than just tangible experiential reality. (In doing so, learning language and learning through language become also a matter of learning about language.)

Development: metalanguage

Example 9

(S looks up to window on hearing noise of gale blowing)

S: It's blowing and blowing out there. Can you hear it?

M: Yes, I can.

S: Hear it isn't mean a talk is it? Means listen to it, isn't it? Means listen to it, isn't it? It's two words, two words. (3;4;5)

By focusing on synonymy and antonymy relations between the words *hear* and *talk*, or *hear* and *listen to*, Stephen in Text 9 could address meaning outside the confines of a specific context. At the same time, the meanings at stake are still very much of the world of lived experience and the everyday.

Development: generic reference and 'self-contextualized' defining and classifying clauses

In Example 10 below, Stephen shows a new ability to refer to generic categories (e.g. dogs), and can also manage defining and classifying clauses so as to refurbish a taxonomy without needing to see and refer to any actual specific new instances. (Here and elsewhere, uncertain transcription is indicated by (?).)

Example 10

(M asks S if he knows a word in the book they are looking at)

S: No.

M: It's an animal.

S: Rabbit?

M: No, it's [the word] dog.

S: Dog's not an animal!

M: Yes it is . . . [further talk omitted] What is it then?

S: It's, it's just a dog.

M: Yes, but dogs are animals.

S: No, they aren't.

M: Well, what's an animal then?

S: Um (?a) giraffe's an animal.

M: Oh, I see, you think animal is only for zoo animals.

S: Yeah.

M: Dogs are animals too, they're tame animals. And cats, cats are animals too. Did you know that?

H: (chipping in) And people, we're animals.

S: We're **not**. (3;8;1)

This text, as it progresses, is self-contextualized; that is, the language itself does not depend on reference to the immediate observable context of situation. It

construes categories linguistically and then refers to those linguistic categories rather than to material reality. These linguistic developments are important for solving the problem of building taxonomies through everyday talk, and enable a more explicit instruction in meaning by the conversational partner.

Problem 2: Observational understandings contradicted by textual information

As Stephen continued to use his language for learning during his fourth year, he constantly discovered that his own understandings, gained from lived experience, might be contradicted by the more knowledgeable adult. Interactions where this was the case oriented him to see text as the key source for learning. In excerpts 11a and 11b for example, the adult responses he received implicitly taught him that a linguistic context provided by a conditional clause (*if you bang your head; if he was trying*) carries more weight than the observable here and now context of the talk:

Example 11a

(M warns S that he will smash his head if he has accident on hard floor)

S: No, 'cause it's got bone in, see? (taps head)

M: But bones can break.

S: No, it's hard.

M: Yes, but if you bang your head on the hard floor, it can still break, the bones can smash. (3;5;20)

Example 11b

(In car at traffic lights discussing sports cars)

F: And they [i.e. sports cars] go fast 'cause they've got a big engine.

S: But that doesn't go faster than us (pointing at car parallel to them) See? We will go faster (as the light turns green)

F: He's not trying; if he was really trying he could go much faster than us.

S: If he goes very fast he can – if he goes very fast he can beat us. (3;6;30)

In the last utterance, Stephen tries out his new understanding, mirroring the conditional clause structure modelled by the adult.

Development: privileging text over lived experience

The fact that this kind of interaction takes the child in a new direction is apparent when we see Stephen puzzling over the status of his own observational experience and privileging textual information as a knowledge source. Text 12 is an interesting example of this:

Example 12

(In car, S talks about seeing a spotted horse)

S: You didn't see it Mum.

M: No, I didn't. Did it have black spots?

S: Yes, (?it didn't have white spots). Really dogs have spots.

M: Yes there are spotted dogs. But horses can have spots too.

S: No, only dogs have spots.

M: But you just **saw** a horse. And giraffes have spots. And leopards have spots.

S: Yes. Tell me some more animals. (3;5;2)

Here Stephen appears uncertain about the status of an observed instance of a class and expresses a desire to establish the category of spotted animals through talk.

Further unexpected examples of the tension between material and textual experience took place just after Stephen's fourth birthday, when he began to ask whether or not he could swim. This was despite the fact that he was regularly at the beach and pool and should have known perfectly well that he could not. Excerpt 13 is from such a conversation:

Example 13

(M driving S to his pre-school)

S: Mummy, can I s- Mummy can I swim by myself now?

M: We'll have to try, won't we? You nearly can. (?You just have to) practise a bit more.

S: um I – I'm better tell Frank if he can swim or not –

M: *Ask* Frank. (correcting)

S: because, because you might be swimming when you're five.

M: (?) It doesn't really matter how old you are; it's just whether you've had some practice . . .

[long further discussion on 4 or 5 different topics omitted]

M: (now talking about new person at pre-school) Oh, is he a *little* boy?

S: Yup, he's three. I'm four. I'm bigger.

M: You are, yes.

S: Can I swim?

M: No, not quite. You don't swim just because you're four.

S: (?) Swim when you're 5?

M: You swim after you've practised – some people swim when they're three, some when they're four, some when they're five, some when they're ten.

S: Some when they're six.

M: Yeah.

S: Or some when they're seven. (4;0;8)

At the time, Stephen's questions seemed very strange, but it is likely that he was puzzling about his status as a swimmer because of the contradiction between his lived experience and verbal assurances he had received that he would be able to manage swimming when he was older. The fact that he had been being guided to orient more and more to text as a source of knowledge meant that he felt the need to check up on this as soon as his fourth birthday arrived.

Development: reasoning from text

All the discursive features so far illustrated – the use of definitions, generic categories, taxonomizing, orientating to text – come together in very occasional examples where Stephen shows the ability to use logical reasoning where he

draws an inference from a linguistically presented premise. Example 14 is such a case:

Example 14

S: Do whales eat people?

M: No.

S: Can they kill people?

M: I don't think they usually do.

S: Can they sometimes?

M: There may be one kind of whale that can; but most whales are nice creatures.

S: They're not creatures, Mum; they're whales.

M: Yes, creature is anything that's alive.

S: Are *we* creatures?

M: Yeah.

S: (laughing) No, we're not! (4;4;10)

This text is a far cry from those produced by Hal in his second and third year and described as fitting the descriptors of horizontal discourse. Here the language is no longer context-specific and context-bound, but rather evidences reasoning from linguistic propositions as Stephen draws the necessary (but to him surprising) conclusion that people must be creatures given that a creature is anything that's alive. This text brings together many features that constitute one major strand in the development and use of language for learning after age three. These features include generic categories, definitions, the use of self-contextualizing language and a cognitive orientation to attending to text.

Problem 3: The inaccessibility of (proto-)grammatical metaphor and abstraction

A second major strand of development after age three is the move towards less concrete meanings, which in turn builds on the less context-dependent language that has already been discussed. In particular, the ability to use defining clauses helped Stephen to begin understanding an early form of what Halliday (1994) refers to as 'grammatical metaphor' (Taverniers 2003). Grammatical metaphor most frequently occurs when a meaning that is congruently expressed as a verb (as with *laugh* or *he laughed*) is instead expressed by a noun (as with *laughter*). When this kind of 'nominalization' happens, the action (here 'laugh') takes on the quality of a thing, since nouns congruently name things or participants in processes. Occasionally coming up against such grammatical metaphor was a third source of problems for Stephen as he attempted to make sense of his world through talk.

As well as nominal expressions relating to time, such as *week* or *year*, a particular expression that caused difficulty for Stephen was the term *traffic jam*. We can understand this by considering both the congruent and (grammatically) metaphorical ways this meaning might be expressed, as shown in Figures 7.3 and 7.4 below:

Example	<i>This traffic</i>	<i>is jamming up</i>	<i>close together</i>
Grammatical function	Participant	Process	Manner
Meaning	concrete things	action	manner

Figure 7.3 Grammatically congruent expression of meaning

Example	<i>This</i>	<i>is</i>	<i>a traffic jam</i>
Grammatical function	Participant	=	Participant
Meaning	observable context		action and manner

Figure 7.4 Defining clause with a (grammatically) metaphorical participant

Examples 15a, b and c below illustrate Stephen's difficulty at age 3½ in making sense of the term *traffic jam*.

Example 15a

(S and M in car waiting to turn right at traffic lights)

S: Is this a traffic jam?

M: No, it's (pause) just waiting at the lights.

S: No, is this *called* a traffic jam? (3;5;8)

Example 15b

(S and M in car stationary at red traffic light)

S: Is this a traffic jam, Mum?

M: Well, (pause)

S: Is this a traffic jam?

M: No, not really. (3;5;13)

Example 15c

(S and M in car stationary at red traffic light)

S: Is this a traffic jam?

M: (weary of the question) Oh, it's a little jam.

S: No, it's a big jam, a big traffic jam; there's all cars (pause). Is it a traffic jam? (3;5;14)

Development: steps towards abstraction

These examples indicate the difficulty of interpreting an expression like *traffic jam* purely by reference to the perceptual context. Stephen attempts repeatedly to test out whether a particular instance of experience constitutes an example

of the category he is grappling with. But it proves an ineffective way of understanding the concept. Indeed, it is only when he receives a definition of sorts (see Example 15d below) that he makes any progress:

Example 15d

(M explains that now they are in a real traffic jam, because when the light goes green they still can't go because there are too many cars. She then continues explaining)

M: A traffic jam is when you can't go even when the light is green.

(The car then stops again as the light ahead goes red)

S: (?) It means when it's green it's called a traffic jam, but this is not a traffic jam cause it's red; a green one is a traffic jam. (3;6;23)

The definition Stephen is offered involves another instance of grammatical metaphor because a complex of meaning involving different processes (*when you can't go, even when the light is green*) is construed as a single participant in the grammatical structure, as shown in Figure 7.5, below:

Example	<i>A traffic jam</i>	<i>is</i>	<i>when you can't go, even when the light is green</i>
Grammatical function	Participant	=	Participant
Meaning	action and manner	=	action of participant + conceded condition

Figure 7.5 A definition involving grammatical metaphor

For a contemporary urban child, the phenomenon of a traffic jam doubtless constitutes common-sense knowledge, and it is certainly related to his everyday experience of travel. At the same time, as far as the language is concerned, some degree of grammatical metaphor¹ and therefore a movement towards abstraction is involved.

The construal of abstract concepts is not what we expect of horizontal discourse, but it is a necessary development for the achievement of literacy and other forms of school(ed) knowledge. As Halliday explains:

The patterns of writing create systemic properties which are then named as abstract objects, like the beginning and end of a page or a line, spaces between words, and letters, capital (or big) and small. (Halliday 1996: 342)

In the following text we can see Stephen attempting to come to grips with the number system rather than the writing system, where a similar kind of abstraction is at play:

Example 16

(S overhears father (F) mention the word *fifty*)

S: Is fifty a number?

F: Yeah.

S: How does it go?

F: It comes after forty-nine.

S: A hundred comes after forty-nine.

F: A hundred comes after ninety-nine. (3;11;7)

Abstraction is involved because although one can point to a material inscription of 50 on the page and name it as an object with *that's 50*, Stephen treats 'a number' as an abstract category with no material referent when he says *is fifty a number*. A form of grammatical metaphor is also evident in the use of *come after* to signal a relationship in a series rather than a material action of movement.

These examples (15 a, b, c, d and 16) indicate that when children like Stephen come into contact with grammatically metaphorical expressions and especially with the semiotic forms of educational knowledge, familiar forms of language and the ways these have typically manifested in horizontal discourse prove inadequate, and the newer resources of self-contextualized talk are called into play. Through these means the child can then begin to reflect on the abstract forms of literacy and numeracy.

The problem of building systematic knowledge

It is not only in dealing with non-congruent grammatical expressions and the abstractions of numeracy/literacy that the limitations of horizontal discourse become apparent. Stephen's parents sometimes struggled to respond to his questions about everyday phenomena, such as the function of power points in the house:

Example 17

(M warns S not to play with wall socket)

M: It's a switch for electricity.

S: (?But what is it?)

M: It's for electricity.

S: But I don't know what it looks like.

M: No, well, you can't see it; the electricity makes things go.

In this case the invisibility of the named 'thing' (i.e. electricity) is problematic due to its verbalization being a nominalized form, but also because a satisfactory explanation seems to call for a groundwork of concepts the child has not yet developed. Stephen was able to use electricity in his everyday life, switching on lights and televisions etc., but not to understand it more 'theoretically' in terms of a definition.

Similarly, the following conversation created puzzlement for Stephen:

Example 18

(S and M are returning barefoot from the beach. M guides him off the scorching bitumen)

M: Walk on the white bit [i.e. the pale paving slabs]; the white is always so much cooler than the black [i.e. bitumen].

S: Why?

M: Because when the sun shines down on the black, the black keeps the hot, but when it shines on the white, the white – the white throws it off.

S: (after a pause) You can't feel it throw off.

M: What?

S: You can't feel it throw the hot off.

M: No, no you can't.

The adult here grapples with the difficulty of explaining matters without using nominalized or technical words, compromising with *the black keeps the hot . . . the white throws it off*, while the child tries to make sense of this by attempting to observe the phenomenon that has been described. While he can feel for himself the difference in temperature, he can only glimpse the nature of explanation, which draws on uncommon-sense knowledge.

A further series of examples of the limitations of horizontal discourse for accessing new knowledge can come from one area of consistent interest to Stephen, that of relationships within the animal kingdom. He engaged in many conversations discussing the eating habits of animals and humans which essentially involved information about food chains and food webs. In the attempt to extend knowledge into such a domain, the segmental nature of the discourse and the fragmented, unsystematic nature of the learning proved to be a constraint. Texts 19–22 demonstrate well the nature of pedagogic conversations in Stephen's fifth year.

Example 19 below focuses on the eating habits of humans:

Example 19

(S, H and M are reading a picture book where a boa constrictor has squeezed its prey)

S: And what's this? (pointing at mangled fawn)

M: That's a deer.

S: Oh! (upset) I wish a snake weren't coming and eat it.

H: You know the – you eat animals.

S: No I don't!

H: You do. You eat – fish, don't you? Salmon.

S: Yeah, but just – (? . . . the little) fishes at the beach but – but – but I don't eat crocodiles, (M laughs) and that's – that's a animal.

. . . [long discussion ensues about animals that people eat, including frogs]

S: Yeah but what – we don't – how can we eat the skeleton?

[conversation continues for several minutes about the bones of various foods: frog, chicken, salmon]

S: (loudly, touching his back) This is backbone.

M: Your backbone, yes . . . (4;0;2)

This snippet can be related to a number of others that took place over succeeding months and which address questions of animal anatomy, particularly the function and appearance of bones. Stephen initiated such conversations with questions such as *Mummy, how can your bones move? Mummy how can you move when something's hard inside you? How can something move your bones? Why do your gums hold your teeth a long time?* and so on.

At the same time, Example 19 links to other conversations about animal predation. For example, Text 20 provides more of the conversation about whales that was presented earlier as Example 14:

Example 20

(M and S are at home together)

S: How do dolphins squirt water up their head?

M: (pauses for thought)

S: How do they?

M: I think it's whales that do that.

S: Yeah, I meant (?that).

M: I don't really know how they do it, darling.

S: Hey Mum, can dolphins eat boats?

M: No.

S: Why?

M: Well –

S: Why don't they?

M: They don't want to eat boats; they eat fish. Are you thinking of that movie?

S: Yes.

M: Oh, that was a whale, but they don't really swallow boats.

S: Do whales eat people?

M: No.

S: Can they kill people?

M: I don't think they usually do.

S: Can they sometimes?

M: There may be one kind of whale that can; but most whales are nice creatures.

S: They're not creatures, Mum; they're whales.

M: Yes, creature is anything that's alive.

S: Are we creatures?

M: Yeah.

S: (laughing) No, we're not! (4;4;5)

A few weeks later, a moment of play led to a further conversation that touched on the same question of what animals eat and on their relations to each other and to people (Example 21). Then, the following month, these issues are pursued at the zoo (Example 22). The questions Stephen asks in these conversations suggest that he is concerned to construct some hierarchy of predation as well as to accumulate more knowledge about creatures that were not accessible to his own perceptual explorations:

Example 21

(S leaps out at M from behind the curtain, roaring)

S: Were you frightened?

M: (teasingly) No, I'm not scared of lions. (grabs S) I just give them a cuddle. (hugs S)

S: (seriously) But it might scratch you.

M: Mm, it might eat me up.

S: Can lions eat people?

M: Yes.

S: Oh! Can sharks eat lions?

M: Lions don't go in the sea.

S: Can lions eat sharks?

M: Sharks never go in the jungle, so they can't, they never meet.

S: In the river, the lion might swim in the river.

M: But sharks don't go in the rivers, they live in salty water – in the sea. Anyway, I don't think lions swim in the rivers much; tigers do, but I don't know about lions.

S: That's what I'm talking about – tigers.

M: Oh, we're talking about tigers now are we?

S: Why don't lions swim?

M: I don't know; maybe they do swim, but I don't think they like the water. (4;4;25)

Example 22

(The family is at the zoo watching a hippo)

S: Does every animal eat hay?

M: No.

S: Horses do. They can't eat people, can they?

... [further talk omitted]

(In another part of the zoo, F lifts S to see the fox)

S: Can foxes eat people? Can foxes eat people, Mummy?

M: Oh no; they eat chickens sometimes. (4;5;16)

I would suggest that although these texts exemplify horizontal discourse in some respects, they also show its limitations as a pedagogical discourse when the knowledge at stake edges into the realm of the un-common-sense. It is true that some of the individual pieces of information contained in these texts are in principle accessible to observation and lived experience, and might therefore count as 'common' knowledge. Moreover the discourse is segmental in that the contexts in which these texts arise are varied – initiated by a movie narrative, a peepbo game, a visit to the zoo, looking at a picture, respectively – and in the fact that information is not systematically sequenced in its presentation nor finalized on any one occasion. Indeed Stephen's continual return to similar themes indicates his desire to engage in further 'goes' at meaning so as to better integrate his knowledge fragments. In certain respects, then, the talk has continuities with what has gone before.

However, just as contact with the semiotic systems of school(ed) knowledge

(numbers and written words) creates pressures on the informal pedagogy of the home and stretches the child's language towards greater abstraction, so I would argue that the attempt to construe knowledge whose basis is less accessible to observation does the same. When we consider the language of Texts 19–22, we can observe that it exemplifies generalizations, is largely independent of the immediate context, and may even use logical reasoning from a textual premise. The language has thus moved quite a long way from the context-specific and dependent language said to characterize horizontal discourse. Yet even with these more developed linguistic resources, the knowledge is somewhat elusive since it is being gained in a piecemeal fashion that does not allow all the fragments to be brought into a relationship with one another.

It is enlightening here to look at how at these topics get expressed in a more overtly 'vertical' discourse. Any selection of texts from the World Wide Web on the topics of food chains and food webs reveals both similarities and differences between the conversational Examples 19–22. One such text explains a food chain as shown in Example 23:

Example 23

FOOD CHAINS AND FOOD WEBS

'In the living world, every form of life is food for another. Food chains and webs show how food and energy are passed between species.'

FOOD CHAIN

'A food chain is a food pathway that links different species in a community . . .'
(*The Balance of Nature*, accessed 12/12/05)

Already it is obvious that the language here is self-contextualized, involves definitions of terms, and uses generalizations, metaphor and abstraction (e.g. *food chain*, *food pathway*). The text continues with explanations of 'food web', 'trophic level', 'producers', 'consumers' and subcategories of these provided in rapid succession. The information in such a text thus involves explicit taxonomies of concepts, systematicity, rapidity and comprehensiveness.

Accessing such a text depends on the kind of language that Stephen has been developing in response to problems encountered in the process of construing common-sense knowledge, and in beginning to encounter more specialized forms of knowledge. Without the ability to learn from definitions, to manage generic categories, to attend closely to text, and to handle abstraction, the meaning of such a text cannot be unpacked. Even so, the differences from the discourse of the home are striking. First there is the speed at which new concepts are provided and built on, something very different from the child's conversational experience; secondly, there is the technicality that is a necessary part of organizing the knowledge in a systematic way. Such texts may also combine technical language with a visual display of some of the relationships being systematized. This again achieves something different from the talk in the home – it enables information that occurred at different points in the oral texts (but was never put together there) to be brought into explicit relationships and integrated into a coherent whole.

Thus in the process of building up their everyday knowledge, children like

Stephen will engage in talk that is not restricted to the context-specific, context-dependent forms of horizontal discourse but will still not be able to build a hierarchical knowledge structure without a more radical departure from the segmentally organized and unsystematic conversational pedagogy of the home.

Conclusion

My object in this chapter has been to bring into clearer focus the nature of the language used for learning in early childhood, demonstrating the close relation between 'learning language' and 'learning through language', while simultaneously clarifying the nature, limitations and potential of children's experience with 'horizontal discourse'. Evidence from the two case studies indicates that Bernstein's characterization of this discourse is an apt one for the first few years of life and for much of the learning that takes place before formal education begins. However, this should not obscure trans-segmental aspects of the tacit learning that occur from the start, nor the significance of developments that gradually take place under the pressure of making sense of everyday experience and in response to the child's own inclination to extend his knowledge through talk – developments that change the character of the talk in significant ways.

I have provided examples of how one child grappled with a range of problems in meaning between the ages of 3 and 5 years. The first of these led to an increasing ability for self-contextualized talk. The problem of building deeper semantic taxonomies when limited to context-dependent classifications was met by making use of everyday metalanguage (e.g. *hear it means listen to it*) and by using classifying and defining clauses which make no direct reference out to the immediate context (e.g. *what's a pet?*, *(a) giraffe's an animal*), together with the construal of generic categories (*dogs have spots*). All of these developments enabled the discussion of meanings without reference to observed instances of the phenomena under attention. This in turn shortcut the gradual process of building taxonomic relations and allowed for a single text to set up new relations or revise an existing classification (M: *Cats are animals too, did you know that?*). In these ways the existing roles of language for accompanying, monitoring and reconstructing specific contexts could be extended to generalizing across contexts. At the same time, the possibility of creating a context linguistically through a hypothetical scenario (*if he goes very fast he can beat us; if you bang your head . . . it can still break*) was made salient in talk within Stephen's family, perhaps due to the elaborated coding orientation favoured, and alerted him to another problem: conflicts between material and semiotic experience. A privileging of the latter enables exploratory talk and logical reasoning, and thus has the potential to further facilitate the building of knowledge beyond observed and lived experience. Paying close attention to text is in fact important both for building common-sense knowledge more quickly and for later learning through the written medium.

The other 'meaning problems' encountered by Stephen related to forms of language or knowledge that are less common-sense. On the one hand there were occasional encounters with nominalized language, both within the realm

of the everyday (*traffic jam*) and in the exploration of other semiotics (*number*). These led to brief forays into the abstract and metaphorical language that is more characteristic of vertical discourse. On the other hand, there was the difficulty of satisfying his curiosity about matters inaccessible to observation (*what's electricity? why is the white [ground] always cooler than the black? how can your bones move?*), as well as difficulty in integrating different pieces of less problematic information (e.g. that some animals eat plants, others eat other animals, humans eat animals, but not all animals eat humans, etc.) These problems were not readily overcome because their resolution requires further development of language through forms of pedagogy specifically designed to build knowledge in a systematic and coherently sequenced manner. While all the linguistic developments outlined above will eventually help the child to engage in earnest with knowledge beyond the everyday, they can only be capitalized on in a limited way in the fragmented pedagogic encounters of everyday life. The systematic organization of knowledge and the need to master it in a particular sequence so that one concept can build on and relate to another is typical of certain kinds of 'educational' knowledge. It calls for a different form of discourse (e.g. Text 23) and for forms of pedagogy that will help the learner to access it. The efficacy of horizontal discourse for creating our common and often tacit understandings should not be assumed to make it well designed for the more conscious creation of the kind of knowledge to which Stephen appeared to be striving in his fifth year.

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Notes

- 1 This is a 'proto' grammatical metaphor in that it is only a single isolated routinized expression, rather than a more creative manipulation of the grammar in the course of organizing a complex text field of knowledge.