Lecture 4 COGNITIVE DIMENSIONS OF SLA FOR LEARNERS

The plan:

Cognition and language
Psychological issues
Learner characteristics

What do children know by the time they start talking at age one? They have already had about twelve months of perceptual and conceptual development. They are adept at perceiving similarities, identifying objects and actions, recognizing faces, sorting like with like. They can orient objects and know where they are kept and how they are used (spoons, cups, bowls, bottle tops; shoes, socks, mittens; balls, dolls, soft toys, books; blankets, chairs, staircases). They know a good deal about their surroundings, about Euclidean space (up vs. down, back [not visible] vs. front [visible], side to side) and topological space (inside vs. outside, contained, attached, supported). They display memory for objects (persisting in looking for keys that have been covered with a cloth); they use "tools" (enlisting adult aid to get a box open); and they make use of pretense in play (moving a block while making car noises).

In summary, they are setting up representations of what they see and know. They make use of these for recognition and recall, summoning them first with gestures and reenactments of events, and later with words (e.g., Piaget 1952; Werner & Kaplan 1963; see also H. Clark 1973). Do children make use of this perceptual and conceptual knowledge as they acquire language? The answer has to be yes. When they learn to speak, they represent their experiences in words. They also draw on conceptual knowledge and its organization as they work out the meanings of new words and constructions. This is a major source of hypotheses about word meanings. Children use words to pick out categories of objects, whether "dog" or "Dalmatian," "pet" or "pest." These categories may be at different levels (compare "dog" to "Dalmatian" [a kind of dog]), or they can be orthogonal to each other (compare "dog" to "pet" or "guard"). Children can use words with these meanings to pick out the same object from different perspectives. They can use other words to pick out actions, where their choices depend on the number of participants, the effects, the manner of acting, and Acquiring language: Issues and questions 7 the location or direction involved (compare throwing a ball, opening a door, drinking milk, pushing someone on a swing, walking, sitting down, swimming, and riding a bicycle).

Children can also assign words to pick out relations in space (compare putting keys in a box, hanging a picture above the head of a bed, climbing down a ladder, sitting beside the fire, crawling across the floor, or looking at a lid on a box, at tiles above the sink, or at a screen in front of the fire). One issue for language acquisition is how

children find out which meanings there are words for; another is just how they map each meaning to the right word. How do children form conceptual categories in the first place? They start out, it seems, with the ability to group things by how similar they are. These early groupings are also influenced by perceptual Gestalts that highlight "figures" against "grounds." Anything that moves stands out against its background and so is the figure. And when objects move, they move as a whole, so whole objects are more salient than any one part. Once children have represented an object-type, they can go on to attend to the actions and relations that link it to other things around it. These kinds of conceptual organization provide a starting point for what might also be represented in language. Early conceptual organization also offers clues to how children might learn language. They must be able to use prior experience to recognize when objects or events recur. They need to set up representations of what they see, hear, touch, and taste so that they can recognize recurrences. Without such representations in memory, they couldn't categorize or organize experience. To do this, children must be able to detect similarity or degrees of similarity, a capacity that appears fundamental for all learning.

Learners can be conservative or bold, or somewhere in between. When children learn language, they could go step by step, one form at a time, waiting for evidence from adult speech and rarely going beyond it – go, run, fall, fell, cat, cats, feet. They could generalize from a few forms to new instances – from jump/ jumped to run/runned, from cat/cats to man/mans. They could go item by item then make some limited generalizations, with different children following different paths. Or they could generalize broadly, acting as if all of language is orderly and rule governed (it isn't), and so regularize many irregular forms (e.g., bringed, sitted, goed, foots, sheeps, mouses). Take the plural -s in English. It has three variants depending on the final sound of the stem, as in cat/cats [-s], dog/dogs [-z], and horse/horses [-iz]. This is the regular plural form that appears on most nouns in English. It could be learnt by rote, with children adding one item at a time as they hear it. Their first version of a word could be singular or plural, depending on what they happen to hear first. So they might learn cat and then cats; stairs then stair; dog then dogs. Rote learning depends on children hearing each form so they gradually fill in the paradigm of singular and plural for each word. Rote learning should preclude errors like mans 8 first language acquisition for the plural of man or teeths for the plural of tooth. It should also preclude children treating words like house and purse as if they were already plural. Yet children make both types of errors. Suppose instead that children learn a few forms by rote and use those as models for deciding on the plural forms for new words: Because of cat–cats, the plural of rat should be rats. Here children would be relying on analogy (Gentner & Medina 1998), using information about similar words (similar in, say, sound or meaning or both) in deciding what the plural (or singular) should be. Analogy can start from any point, with

children choosing a regular or an irregular form. For instance, analogy from dog–dogs applied to cat and sheep yields cats and sheeps. Analogy from an irregular word (e.g., foot, child) runs into problems. Children might instead consider all the forms accumulated so far and abstract a rule for the plural (Pinker 1999).

This could be stated as "Add -s to nouns to form the plural." When the words are regular, children succeed in producing the correct forms; when they aren't, they overregularize. Just as for analogy, rules fail for irregular words. The rule applied to words like foot, child, or mouse does not result in the conventional feet, children, and mice. These irregular words either require additional special rules or rote learning of each adult form. Both analogy and rule work by adding a word-ending to the existing word. Children start with a source word, add something, and produce a new form. An alternative is to start from the goal – what the plural form should sound like – and adjust the singular word until it fits. Here children could use a schema or template for the plural (Bybee & Slobin 1982). The schema could be characterized as requiring a form ending in -s, roughly, plural = [word + s]. If a word fits this schema (it already ends in -s), no change is required; if it doesn't, then the word must be adjusted until it does (by adding -s). The schema approach accounts for the same regular forms as the analogy and rule approaches do, and it also accounts for why children fail to add a plural ending to nouns like horse orrose: They end in an -s sound and so already fit the schema for plural.

The answer depends on careful analysis of the forms children produce: what they get right and what they get wrong. One factor is the identification of recurring patterns and their frequency. Children hear instances of some nouns and verbs more frequently than others (man occurs many more times than field, and put more often than yell). This is token-frequency. They also hear some types of nouns and verbs more often than others: There are many more regular nouns (e.g., book/books, cat/cats, chair/ chairs) than irregular nouns (e.g., foot/feet, man/men, mouse/mice) in English. The same goes for verbs: Regular verbs (e.g., walk/walked, open/opened, jump/ jumped) far outnumber irregular ones (e.g., go/went, bring/brought, fall/fell). To what extent does this token- or type-frequency play a role in children's generalizations? Researchers agree that children must learn both sound systems and vocabulary. (How they learn them is another matter.) Sound systems are specific to each Acquiring language: Issues and questions 9 language, and children must learn the one they are exposed to (Jusczyk 1997; Vihman 1996). And vocabulary presents a formidable challenge. Adults know somewhere between 50,000 and 100,000 distinct words, so the learning required here is extensive (Bloom 2000; Clark 1993).

There is much less agreement about the learning of syntactic constructions. Do children rely on innate knowledge for these or do they learn them as they do words? The arguments for innateness have hinged largely on the putative difficulty of learning

syntactic constructions from child-directed speech. Researchers have pointed to the ungrammaticality of adultto-adult speech and also argued that some constructions are either absent or so rare as to make them unlearnable. If children acquire them anyway, they must be relying on some built-in knowledge. Both premisses here are in dispute – that child-directed speech is ungrammatical and that certain structures are unavailable in that speech. What role do children play in learning? They could be passive recipients of the language directed to them, simply absorbing whatever they hear, or they could play an active role, selecting and generalizing about whatever they have taken in so far. To what extent are children miniature scientists, testing hypotheses and checking up on what they know about particular words or constructions? Do they detect patterns and apply them to new cases? Do they make inferences about possible meanings and make use of them in later word use? Overall, the role that children play provides critical information about how (and what) they learn at each stage and about the learning mechanisms they rely on.

Some approaches to language acquisition focus on the product – the end state to be achieved – rather than on the process. This distinction tends to capture one difference between linguistic and psycholinguistic approaches to acquisition. Linguists tend to focus on the product, for instance, what a relative clause looks like, laid out on the table for analysis. In contrast, the psycholinguist is more concerned with when the speaker needs a relative clause, how he accesses the pertinent structure, the phrases, words, syllables, and sounds, and then produces the utterance itself piece by piece. This has led to differences in emphasis, with linguistic approaches focussing more on the adultlike nature of children's knowledge while psychological ones have focussed more on the changes that occur during development. One linguistic approach known as parameter-setting proposes that children start out with default settings for parameters that capture all the dimensions that distinguish among languages. For instance, languages differ on whether they require subjects to be marked by a pronoun where there isn't a noun subject present. (Where they don't, languages typically mark person [e.g., I, you, he] and number [singular or plural] with endings on the verb, as in Italian.) This is called the Pro-drop parameter, and researchers have assumed that the default value is to drop pronoun subjects (much as in Italian or Spanish). Each parameter has 10 first language acquisition a start-up setting (the default) and children begin there, regardless of the language to be acquired. Then, at a certain point in development, they identify the actual parameter-setting for that language (it is not clear what the critical data are) and from then on make adultlike use of the pertinent forms. What happens before a parameter is set is of scant interest. The main concern is with the parameters themselves, the values for each, and when the correct setting for each is triggered. Setting parameters is regarded by some as something that happens automatically when children reach the right age and stage of development. This leads researchers to ignore

everything that happens before a parameter is set (e.g., Borer & Wexler 1987; Radford 1990). Children's errors prior to adultlike use and any continuity in their attempts to convey a particular meaning are simply not relevant.

Other approaches regard continuity of expression and function as critical clues to tracing the path children follow as they acquire language. This holds for most processing approaches. For example, they may identify a particular conceptual distinction and then trace its expression by children as they learn more about the conventions of a particular language. Take the notion of plurality, more than one. Children acquiring English often start out by using a word like more or a numeral like two to express this notion, as in more shoe, two cup. Only after that do they learn to add the plural ending (shoes, cups). The earlier expressions for plurality show that children have grasped the notion but haven't yet worked out how to express it in English. This comes back to the distinction between conceptual and formal complexity. Children may have acquired the pertinent concept (here, plurality) but not the forms that are conventional for its expression. Processing approaches have also focussed on what children do at one stage compared to the next. One approach has been to look at where children start, what they attend to first, and what they change in their language as they get older. Their preferences and the changes they make can be captured as processing strategies or operating principles. For example, in producing words, children focus on the core word (the stem) first and on getting the initial sounds right. This strategy can be represented as "Pay attention to the beginnings of words." It helps others recognize the words children are trying to say.

Their next move is to start producing word-endings (like the plural, say): "Pay attention to the ends of words." But now they need to attend to the range of meanings conveyed by word-endings, so another strategy might be to look for endings that have a stable, identifiable meaning and to use those whenever needed. Researchers have looked for consistencies in how children interpret and produce words from the earliest stages on and from those patterns have derived the strategies children seem to apply (e.g., Slobin 1985b). This approach relies on looking at both what children get right and what they get wrong. Sometimes they fail to produce a form altogether (I throw ball, without a or the before ball); at other times, they apply a form incorrectly (bringed, foots). This approach is concerned both with learning and with how changes come about. Processing approaches take account of the dynamic nature of conversation. Speakers interact with each other. They don't produce isolated sentences that stand Acquiring language: Issues and questions 11 on their own. Once someone has mentioned Kate, for example, the next speaker will use she (not Kate) to refer to her again. Or, once someone has asked Rod whether he wants lasagna, he can answer Just a little, or Yes please. What these utterances refer to requires that we know that there was a prior offer, Would you like some lasagna? Without that, we can't give a full

interpretation to Yes please. What someone says depends critically on what someone else has just said and often can't be interpreted without a whole sequence of contributions to the conversation. Imagine recording a conversation and then transcribing what only one of the speakers said. It quickly becomes difficult or impossible to interpret what that person means. In fact, utterances depend on both conversational and physical context for interpretation (H. Clark 1996). This should hold even more strongly for young children whose utterances may consist of only one or two words.

The goal of acquisition –

The goal is to become a member of a community of speakers. This entails learning all the elements of a language, both structure and usage. Children need to learn the sound system, the phonology. This in turn means learning which sounds belong (sound segments like p, b, t, d, s, z, a, i, u, e), which sequences of sounds are legal in syllables and words (phonotactic constraints, e.g., drip but not dlip in English), stress patterns on words (e.g., electric vs. electricity), tone on words in a language like Mandarin or Hausa, and the intonation contours in sentences that distinguish a question from a statement (e.g., Alan is coming at six o'clock? vs. Alan is coming at six o'clock). They need to learn about the structure of words, their morphology: whether they are made up of one syllable, two, or many (compare pop, slipper, alligator), along with their meanings. Words can be complex and made up of several building blocks, sometimes with suffixes or prefixes added to root forms (e.g., write/writer, saddle/unsaddle, push-chair, sun-rise, house-builder, complexify, physicist). These building blocks also allow for the construction of new words to express new meanings, meanings for which there is no existing conventional form.

Verbs may belong to many paradigms too, each one marking tenses differently, for example. In each instance, noun and verb endings add modifications to the basic meaning of the roots or stems. 12 first language acquisition Speakers don't use just one word at a time. They combine them, and again the possible sequences of words in a language have to be learnt. This is the syntax. Just as with sounds, some sequences are legal, others not. In English, adjectives precede the nouns they modify (e.g., the green vine, not *the vine green), articles like a or the and demonstratives like that also go before their nouns (e.g., the whistle, that rosebush). Relative clauses follow their nouns (e.g., The wallaby that was hopping across the path was a female). Subordinate clauses introduced by conjunctions like if, because, or when in English can be placed before or after main clauses (e.g., When the bell rang, all the children came inside, or All the children came inside when the bell rang), but in Turkish or Japanese, for instance, such clauses must precede the main clause. Some constructions allow a number of different nouns and verbs to be used in them; others may be very restricted. Just as with sounds and words, children have to learn what the possibilities are.

Language is used to convey meaning. Words, suffixes, and prefixes all carry meanings that are conventional (Lewis 1969). The speech community relies on all its members agreeing that ball means 'ball', throw means 'throw', and sand means 'sand'. These conventions are what make languages work. Without agreements about meanings, one couldn't rely on the fact that the next time someone uses sand, say, people hearing the word will still interpret it in the same way. Conventions are critical in language use. They govern both word meanings and construction meanings. In learning a language, children must learn the conventions for that community. Languages work in large part because they don't use needless duplication. Each conventional word differs from all its neighbors. Each word reflects a choice made by the speaker to convey one meaning rather than another and so contrasts with all the others (Clark 1990). If speakers wish to convey a meaning for which there is no conventional word, they can construct a new one to carry that meaning. This new word then contrasts with any previously established ones. For example, the verb to skateboard was introduced along with skateboards themselves to talk about a new method of travel. This verb immediately contrasted with all existing verbs for other means of moving (to bicycle, to sled, to ski, to roller-skate, etc.) (see Clark & Clark 1979).

Language, and especially its vocabulary (the lexicon), is not static. Speakers coin new words as society changes and adds new inventions and new technologies. But each new word is accepted only if its meaning contrasts with the meanings of existing words. Conventionality and contrast are powerful pragmatic principles governing language use (Clark 1993). Knowing what the conventions are for the elements of a language and knowing how to use them are two different things. Children must learn how each word and construction can be used to convey their intentions.

Questions for discussion

1.Do children depend on rote, analogy, rule, or schema?

2. Which account best captures what they do with the regularities they detect in language?

3. What do children know by the time they start talking at age one?

4. What are the cognitive issues of SLA?