1 Introduction

In this introductory chapter, we briefly outline (1) the major theoretical approaches to child language acquisition research, (2) the domains and debates to be covered in the rest of the book and (3) the major methodological paradigms used in the field.

1.1 The major theoretical approaches

Although there are a few exceptions, for the majority of the debates that we will encounter in this book, each of the competing proposals will generally be aligned with one of the two major theoretical approaches to language acquisition. These are (a) the **nativist, generativist, Universal Grammar (UG)** approach and (b) the **constructivist, emergentist, socio-pragmatic, functionalist, usage-based** approach. As outlined below, which terms are most appropriate depends on the precise nature of each proposal, and the domain under investigation.

1.1.1 Nativist/generativist/Universal Grammar (UG) proposals

- A theoretical proposal that is **nativist** assumes that some important aspects of children's *linguistic* knowledge are not acquired, but **innate** (present from birth and, for at least some researchers, encoded in the genome).
- A theoretical proposal that is **generativist** assumes that children's knowledge of grammar (encompassing syntax, inflectional morphology and, in some approaches, phonology) consists of knowledge of formal 'rules' or operations that operate on abstract linguistic categories (e.g. VERB, NOUN) and phrases (e.g. VERB PHRASE, NOUN PHRASE). For example, oversimplifying somewhat, one operation for forming an English sentence combines a NOUN (e.g. *John*) and a VERB (e.g. *danced*) in that order (e.g. *John danced* not *Danced John*). This is an example of a **syntactic** operation (a 'rule' of **syntax**; see Chapters 4 and 6). An example of a **morphological** operation (a 'rule' of **inflectional morphology**) is the process by which the past-tense

-ed inflectional morpheme is added to a regular English VERB (e.g. *kiss* → *kissed*; see Chapters 4 and 5).

- All the **generativist** approaches that we will meet in this book are also **nativist** approaches, in that they assume that knowledge of (at least some of) these categories, phrases and operations is innate. Approaches that are both nativist and generativist are also termed **Universal Grammar** (UG) approaches, because this knowledge is held to be part of a Universal Grammar (a general grammar that applies to all the world's languages), which is innately specified (i.e. children have knowledge of UG from birth). In principle, it would be possible to have a proposal that is **generativist** (i.e. couched in terms of formal rules/operations on syntactic categories and phrases) but not **nativist** (these rules/operations, categories and phrases are learned as opposed to innate). However, none of the generativist accounts discussed in this book are of this type (and indeed, we are aware of no such proposals in the child language acquisition literature).
- It is also possible for a proposal to be **nativist** (i.e. to assume that children have some innate linguistic knowledge) but not **generativist** (because this knowledge pertains to some area of language other than grammar). For example, a strong version of the lexical-principles account of word learning (see Chapter 3) assumes that children are born with the assumption that new words are most likely to refer to whole objects (as opposed to parts or properties of objects). Such a proposal is nativist (it assumes innate knowledge) but not generativist (this knowledge pertains to word meanings, not grammar). Although we will encounter some proposals that are nativist but not generativist (though not vice versa), the two almost always go hand in hand, and some authors use the terms interchangeably. We will endeavour to be precise in our use of these terms, though we will sometimes refer to generativist–nativist approaches where appropriate.

1.1.2 *Constructivist/emergentist/socio-pragmatic/functionalist/usage-based proposals*

- A theoretical proposal that is **constructivist** assumes that children do not have any innate knowledge of grammar (i.e. it is a **non-nativist** proposal). Of course, the *ability to learn* language is held to be innate (and specific to humans), but, to again take an example from the domain of syntax, the approach assumes that children are not born with grammatical categories such as VERB and NOUN, but must acquire them by generalizing across the adult speech that they hear. Hence, most constructivist approaches are **input-based** approaches, in that they assume that characteristics of the input are a

driving force in children's acquisition (for instance, that they will most easily acquire the words and constructions that they encounter most frequently).

- Constructivist proposals are **non-generativist** in that they do not see the adult end state as a system of formal rules or operations that act on categories such as VERB. For example, in Chapter 5, we will see how a constructivist account of past-tense formation argues that forms such as *kissed* are *not* produced by a formal operation (or 'rule') that adds *-ed* to the verb (*kiss* → *kissed*), but by analogy with similar sounding pairs such as *miss* → *missed*. The differences between generativist and constructivist approaches to morphology and syntax are outlined in detail in Chapter 4.
- Because, under this view, the categories and procedures for sentence formation are not innate but emerge from the generalizations that children form, **constructivist** proposals are also sometimes termed **emergentist** proposals.
- A theoretical proposal that is **functional** or **usage-based** (we will use these terms interchangeably) assumes that children's language acquisition is driven by – and hence cannot be explained without reference to – their desire to **use** language to perform communicative **functions** (such as requesting an object or activity, commenting on a situation etc.) and to understand the utterances of others. For example, the finding that children produce more sentences beginning with *I* than *You* most likely demands a functional, usage-based explanation (e.g. children are more interested in talking about themselves than a conversational partner). Constructivist proposals are sometimes described as **emergentist** in the sense that children's grammar **emerges** from their **use** of language in this way (as opposed to the related, but different, sense discussed above).
- A theoretical proposal that is **socio-pragmatic** assumes that crucial to children's ability to learn language is the ability to make social-pragmatic inferences regarding a speaker's focus of **attention** and his or her **communicative intentions**. For example, social-pragmatic accounts of word learning (see Chapter 3) assume that children know that a speaker who produces a word whilst looking at an object (a) is attending to that object and (b) intends to label that object for the child.
- Most **constructivist** proposals are also **functional/usage-based** and **social-pragmatic** in nature. However, we will also encounter constructivist proposals that do not make reference to language use or to social-pragmatic understanding. For example, in Chapter 6, we will discuss constructivist proposals under which children form grammatical categories by grouping together words that appear in similar sentence positions (e.g. *the X*), without regard to meaning. Thus though some authors use all of the terms discussed in this section interchangeably, we will again endeavour to be precise in our use of the relevant terms.

1.2 The domains and debates

- Chapter 2 investigates speech perception, segmentation and production. The debates here concern how children develop an inventory of the phonemes of their language (in perception), how they segment the continuous speech stream that they hear into words, phrases and clauses, and how they arrive at an adultlike capacity for speech production. In each case, the debate is between one constructivist position and one or more positions that posit some innate knowledge (e.g. of distinctive phonological features, stress cues to word segmentation and rules or constraints on production).
- Chapter 3 investigates how children learn the meanings of words. The debate here is between one account that (at least in its strong form) makes certain nativist assumptions (the lexical constraints/principles approach), one constructivist account (the social-pragmatic account) and one account that is neither constructivist nor nativist, and rejects both innate principles and the importance of social-pragmatic understanding (the associative-learning account). We also evaluate a proposal under which children use syntax to learn word meanings (syntactic bootstrapping), which is potentially compatible with both approaches.
- Chapter 4 does not present empirical data but sets out the positions of the two competing theoretical approaches with respect to inflectional morphology (Chapter 5) and syntax (Chapters 6–8). This chapter can be skipped by readers who are already familiar with both approaches.
- Chapter 5 discusses three debates in the acquisition of inflectional morphology: root infinitive errors, productivity and rules versus analogy in inflectional morphology (with special reference to the English past-tense debate). In each case, the debate is between one or more generativist accounts (e.g. the Agreement/Tense Omission model; the variational learning model; the dual-route model) and one constructivist account (e.g. lexical-learning approaches; the single-route model).
- Chapter 6 also discusses three debates, in this case, relating to the acquisition of basic syntax: acquiring syntactic categories, learning basic word order and the retreat from overgeneralization error. Again, in each case there is a debate between one or more generativist accounts (e.g. semantic bootstrapping, prosodic bootstrapping, parameter setting) and one or more constructivist accounts (e.g. distributional learning), though (particularly for the first and third debates) we will also encounter some proposals that combine elements of both approaches.
- Chapter 7 (movement and complex syntax) discusses the acquisition of passives, questions, relative clauses (and questions containing relative clauses, with special reference to the 'structure dependence' debate) and sentential

complement clauses. For each topic, the debate is a relatively straightforward contrast between generativist movement-based approaches and constructivist approaches which assume that children acquire constructions by abstracting across exemplars of the relevant constructions in the input (and also by combining these acquired constructions).

- Chapter 8 discusses three debates regarding children's acquisition of adultlike interpretations of pronouns (binding), quantification (quantifiers such as *each* and *every*) and control (null or omitted arguments). Although most of the proposals and experimental studies in this area stem from the generativist approach (e.g. innate binding principles), we will also discuss constructivist approaches based on the notion of construction learning and social-pragmatic understanding.
- Chapter 9 briefly highlights some debates that are not considered in detail elsewhere, but that bear on the wider debate between generativist–nativist and constructivist approaches: modularity/domain specificity, atypical language development (SLI, Williams syndrome, autism), the critical-period hypothesis (early language deprivation, children 'inventing' languages, second language learning), the genetic basis of language and its evolution, and language change. We end by drawing together some conclusions based on the research discussed throughout the book, and by presenting some future challenges for both approaches.

For each debate in each domain, our goal is to *contrast* the competing theoretical proposals, and to investigate which is better supported by the data. Although, as we shall see, both the generativist and constructivist approaches have their own strengths and weakness, we should emphasize that our goal is *not* to advocate a 'third-way' or 'radical middle' account of language acquisition that seeks to reconcile the two approaches. It is becoming increasingly common to see statements such as 'all theories of language acquisition posit some learning and some innate knowledge'. This is true, but only trivially so. The point of disagreement between the two theories is whether or not children are born with distinctive features (e.g. voiced/unvoiced), grammatical categories (e.g. VERB, NOUN), phrase structure (e.g. VP = VERB, NP), principles (e.g. structure dependence, the binding principles), parameters (e.g. the head-direction parameter), default assumptions (e.g. an object in the world has only one label), linking rules (AGENTS of ACTIONS are SUBJECTS of sentences) and so on (depending on the particular domain). The challenge for generativist approaches is to provide evidence that children have this innate knowledge, and/or evidence against the claim that it can be acquired on the basis of experience. The challenge for constructivist approaches is to provide evidence against the claim that children have this innate knowledge, and/or evidence that it can be acquired from experience. But this highly abstract,

specifically linguistic knowledge is either present at birth or it is not. There can be no compromise position.

1.3 Methodologies

Since it is, of course, impossible to investigate speakers' linguistic knowledge directly, various methodologies are required to infer their knowledge from observable behaviour. This behaviour includes not only production of language but also performance on tasks designed to reveal comprehension (e.g. acting out a sentence with toys) and speakers' intuitions regarding possible interpretations or grammatical acceptability (i.e. judgment tasks). It is important to bear in mind that no methodology (even simply recording children's spontaneous speech) provides a 'pure' measure of linguistic knowledge. Children's performance will always reflect not only their knowledge but also factors such as attention and memory (e.g. the ability to keep an entire sentence in mind) and the ability to meet the particular task demands of a particular study (e.g. the ability to repeat a sentence or to manipulate toys).

There are two ways around this problem. The first is to seek converging findings from different methodologies. For example, if we want to know whether children understand that English uses SUBJECT VERB OBJECT (AGENT ACTION PATIENT) word order (as in *The dog kicked the cat*), we could look to see whether children produce such sentences in their spontaneous speech, whether they produce them in an experimental setting with novel verbs, and whether they show understanding of such sentences when they hear them (e.g. when asked to enact the sentence with animal toys).

The second approach is to build suitable controls into our investigations. For example, if a child cannot correctly enact *The dog meeked the cat* (where *meeking* is a novel action taught in an experiment), one possibility is that she does not have verb-general knowledge of SUBJECT VERB OBJECT word order. Another possibility is that the child is failing the task because she is unable to remember the sentence, does not understand what is required in the task, and so on. A possible control condition here would be to have the child enact a sentence with a familiar verb. For example, if she can correctly enact *The dog hit the cat*, then this allows us to rule out (at least) the possibility that the child simply does not understand the task (or does not wish to 'play'). Suitable controls must also be built into investigations of children's spontaneous speech. For example, if a child produces the form *her* in subject position (e.g. **Her is playing* vs *She is playing*), one possibility is that she does not have the correct system for marking case. Another possibility, however, is that the child has yet to learn the form *She*. A suitable control in this case would be to see if the child continues to produce such errors after she has produced the *She* form in her spontaneous speech.

Table 1.1 *Major paradigms in child language acquisition research (the focus here is on paradigms that will be frequently encountered in subsequent chapters, in particular those that produce quantitative data that can be analysed statistically)*

Paradigm	Examples	Advantages	Disadvantages
Naturalistic data studies			
Recording children's **spontaneous speech**, often longitudinally	Speech perception, segmentation and phonology (Ch. 2); inflection (Ch. 5); simple and complex syntax (Chs. 6–7)	Naturalistic vs artificial (e.g. lab studies); can also record caregivers to investigate role of input; single corpus can test many different predictions	Very time consuming; consequently, sampling often thin (e.g. 1hr per week), leading to unreliable estimates of productivity/error
Caregiver diary (often combined with longitudinal recordings of spontaneous speech)	Speech perception, segmentation and phonology (Ch. 2); simple and complex syntax (Chs. 6–7)	Very detailed data on a particular structure (e.g. coarticulation, *wh*-questions); often attempt to record *all* instances	No data on acquisition of other structure; can be used in only one domain
Caregiver checklists (e.g. *McArthur Communicative Development Inventory*)	Word learning (Ch. 3); inflection (Ch. 5)	Can collect large volumes of data quickly; generally good reliability (e.g. high correlation between reported and experimentally assessed vocabulary)	Can exhibit particular biases (e.g. parents may recall more nouns than verbs for vocabulary checklist); cannot be used to test fine-grained predictions (e.g. different error rates for different auxiliaries)
Experimental production studies (elicited production/repetition studies are sometimes conducted longitudinally)			
Elicited production: child asked to describe scene (e.g. *Ernie meeking Bert*) or 'fill in the gap' (e.g. *Ernie always meeks, so yesterday he . . .*), often using novel verb	inflection (Ch. 5); simple and complex syntax (Chs. 6–7)	High degree of control over variables of interest; useful for collecting data on structures rarely produced in spontaneous speech (e.g. complex questions)	Relatively difficult for children; problems with memory, utterance-planning etc. may obscure competence; children may still avoid very low frequency/complex structures

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Paradigm	Examples	Advantages	Disadvantages
Repetition (or '**elicited imitation**'): child asked to repeat experimenter's utterance, with deviations analysed. Sometimes the utterance is ungrammatical (e.g. *I pretend her playing*) and/or particular items (e.g. auxiliaries) may be replaced with novel items, or a cough (e.g. *She fep playing*; *She [cough] playing*); Correction or substitution of the missing item constitutes evidence for knowledge	Simple and complex syntax (Chs. 6–7); inflection (Ch. 5)	Can be used to elicit attempts at structures that children would normally avoid (e.g. complex relative clauses). Perhaps surprisingly, errors do seem to reflect children's knowledge	Too 'easy' for very short sentences and/or older children (though using time taken to repeat as dependent measure can be a solution)
Syntactic priming: experimenter describes scene using particular structure (e.g. passive). Child then describes new scene. Use of same structure as opposed to alternative (e.g. active transitive) suggests prior knowledge of structure	Complex syntax (Ch. 7); occasionally simple syntax (Ch. 6) though can be problematic	High degree of control over target structure without drawbacks of imitation paradigm; does not require use of novel verbs, reducing memory demands	Use of a structure does not necessarily reflect prior knowledge as children can be 'primed' to use ungrammatical structures that they have never encountered (see below and Ch. 5)

Weird word order: experimenter describes scene using an ungrammatical structure with a novel verb (e.g. SOV *Ernie the car gopping*). Child then describes new scene (with same verb). Use of ungrammatical word order suggests verb-specific learning	Simple syntax (Ch. 6)	Since WWO studies contain a condition in which conventional word order (SVO for English is primed), they can be seen as priming studies (sharing their advantages) with added advantage of WWO 'control' condition	Like other production paradigms, can be relatively difficult for children, particularly since novel verbs are generally used
Comprehension studies (again, these can be – though in practice rarely are – conducted longitudinally)			
Act-out tasks: child asked to enact scene described by experimenter, usually using novel verb (e.g. *Ernie is meeking Bert*) or conflicting cues to meaning (e.g. *Him are pushing the girls*)	Simple syntax (Ch. 6); occasionally complex syntax (Ch. 7)	Easier than production studies (particularly for very young children who produce only very short utterances) – better measure of knowledge	Surprisingly difficult for young children, perhaps due to memory demands involved in planning an action
Preferential looking: child hears sentence, usually with novel verb (e.g. *Ernie is meeking Bert*) and can watch either of two scenes; one matching (e.g. Ernie performing novel action on Bert) one mismatching (e.g. Bert performing action on Ernie)	Word learning (Ch. 3); simple syntax (Ch. 6)	Easier than act-out tasks, thus suitable for use with children as young as 1;10 (simple syntax) and 6 months (word learning); eye tracking can be used to investigate knowledge at a fine-grained level	Relies on assumption that children will always look longer at the matching than mismatching screen (in fact, may identify matching screen, then look away); controversy regarding training (see Ch. 5); unsuitable much above 2;6
Pointing: as preferential looking, with children asked to point to the matching scene, display or (for word learning) object	Simple syntax (Ch. 6); word learning (Ch. 3)	Produces unambiguous binary outcome measure (compare preferential looking above)	Slightly harder than preferential looking tasks, thus generally unsuitable for children younger than 2;0

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Paradigm	Examples	Advantages	Disadvantages
Conditioned head-turn preference procedure: children trained that (for example) English audio is looped when they fix gaze on one loudspeaker; Russian audio another loudspeaker	Speech perception, segmentation and phonology (Ch. 2); simple syntax (Ch. 6)	Can be used with very young children (e.g. 4 months)	Interpretation can be problematic; listening time difference means children can *tell the difference* between two stimuli, but not necessarily anything more
Habituation: used together with some looking/listening time measure; children become bored with repeated presentations of similar stimuli (e.g. dog, cow, horse) and looking/listening times decrease; if a stimulus from a different category (e.g. hammer) causes recovery of looking times, this is evidence that children have formed the two categories	Speech perception, segmentation and phonology (Ch. 2); word learning (Ch. 3)	Can also be used with very young children	If some children show habituation (novelty preference) and others a familiarity preference, these may cancel each other out when group means are taken, potentially hiding effects
High-amplitude sucking/kicking: similar to head-turn preference procedure above, except that playback controlled by sucking or (pre-natally) kicking rate	Speech perception, segmentation and phonology (Ch. 2)	Can be used with children only a few days old (or even unborn)	Can be used to investigate knowledge of language only at a coarse level (e.g. do infants prefer mother's voice to that of another speaker?)
Event-related potentials (ERPs): recorded from scalp electrodes in a cap	Speech perception, segmentation and phonology (Ch. 2)	Can be used with very young infants; good at detecting relationship between stimulus and response	Bad at detecting localization; problems with relating infant measures to better-specified adult measures