

# 4

## Input and Interaction: Tutorials for Toddlers

### CONTENTS

Talking to young children	86
Characteristics of Child Directed Speech	88
Phonology	88
Vocabulary	89
Morphology and syntax	89
A dynamic register	91
Individual differences and their effects	92
Child Directed Speech: Summary	94
Lack of interaction: Can children learn language from television?	95
Imitation	97
Linguistic creativity: Children make their own sentences	97
Skinner and Chomsky on imitation	98
Imitation as a mechanism in cognitive development	98
Imitation: Who, when and how?	99
Individual differences in imitation	101
Corrective input	102
Recasts: Adult repetition of the child	102
The 'no negative evidence' assumption	103
Contrastive discourse	105
Negative feedback	110
Corrective input: Summary	111
Universality of CDS	112
Input and interaction in language acquisition	114

## OVERVIEW

By the end of this chapter you should be able to describe Child Directed Speech (CDS). This is the special register adopted by adults and older children when talking to young children. You will gain some appreciation of specific modifications which are made at the levels of phonology, vocabulary, morphology and syntax. It will become apparent that, in several instances, CDS functions to facilitate language development. You will also gain an understanding of individual differences in CDS. In particular, you will be able to describe how socioeconomic status affects the amount and quality of language children hear, and also, how these differences impact on language development.

This chapter will also introduce you to the difference between input (the language forms children hear) and interaction (the way language is used in conversation). With regard to interaction, you should be able to assess the importance of imitation (both verbal and non-verbal) for language acquisition. You should also be able to describe a special form of verbal imitation, the adult recast, and describe its potential as a form of corrective input for child grammatical errors. You will also gain some understanding of cross-cultural research on the child's linguistic environment and be able to evaluate the claim that at least some aspects of CDS may be an inevitable feature of adult-child conversation.

## Talking to young children

To many people, there is nothing special or mysterious about child language development. If you grab a representative of the people – the man on the Clapham Omnibus – and ask him how children learn language, it's an even bet he'll tell you that they learn it from their parents. And who will contradict him? A child born to Tagalog-speaking parents in the Philippines will grow up speaking Tagalog. The child born to Inuktitut-speaking parents in the Arctic region of Canada will learn Inuktitut. My own parents are monolingual English speakers, and here I am, thinking, speaking, reading, and occasionally writing, in English. In one sense, therefore, no-one can argue with the man on the bus. Children learn language from their parents. Unfortunately, though, this formulation does not get us very far.

The real problem is to understand *how* the child learns. We need to find out what learning mechanisms and conceptual knowledge the child applies to the task of language acquisition. In other words, we want to lift the lid on the machinery of language acquisition, all of which resides in the child. The language children hear from parents and others is merely the fuel that allows the machine to run and produce a mature knowledge of language as its end product. Linguistic input is certainly an essential ingredient, which is why we will examine it in this chapter. But we should not forget that, ultimately, we want to establish how the child's language learning capacities engage with and learn from the available linguistic environment. If we torture the fuel metaphor just a little further, one question, of considerable interest, crops up straightaway. Does our language learning machine require low-grade fuel or a high octane deluxe grade? Some machines run very well on low-grade fuel. When it comes to language

acquisition, we find that nativists, in particular, adopt this ‘low grade’ view. In a well-known statement, Chomsky (1965: 31) described the input available to the language learning child as ‘fairly degenerate in quality’, characterized by ‘fragments and deviant expressions of a variety of sorts’ (ibid.: 201). However, as soon as researchers began to examine the way parents talk to their children, it became apparent that they adapt their speech in numerous ways at every level of linguistic analysis (Snow, 1972; Phillips, 1973). In other words, parents seem to provide high octane input as the fuel for language acquisition.

The way in which parents speak to their children constitutes a special register or style, which has been given many names over the years (see Box 4.1). We will favour **Child Directed Speech** (CDS), with a brief diversion into Infant Direct Speech (see Saxton, 2008, for a justification). A critical distinction is between *input* and *interaction*. Input constitutes the particular language forms that the child hears, while interaction refers to the way in which those forms are used in adult–child discourse. Imitation, broadly construed, is a critical form of interaction for language development which includes both verbal and non-verbal behaviour. We will discover that CDS facilitates language acquisition. But many researchers downplay the importance of ‘high octane’ CDS, on the grounds that it is not universally available to all children. We examine the evidence for this assumption in what follows.

### BOX 4.1 TERMS OF ENGAGEMENT

The register used by parents and others to talk to young children has been given many names since the late nineteenth century. Here are 15 of the most prominent:

- 1 baby talk (Lukens, 1894)
- 2 nursery talk (Jakobson, 1941/1968)
- 3 motherese (Newport, 1975)
- 4 caregiver speech (Ochs, 1982)
- 5 caretaker talk (Schachter, Fosha, Stemp, Brotman & Ganger, 1976)
- 6 verbal stimuli (Skinner, 1957)
- 7 exposure language (Gillette, Gleitman, Gleitman & Lederer, 1999)
- 8 input language (Ninio, 1986)
- 9 linguistic input (Schlesinger, 1977)
- 10 primary linguistic data (Chomsky, 1965)
- 11 Infant Directed Speech (Cooper & Aslin, 1990)
- 12 Child Directed Speech (Warren-Leubecker & Bohannon, 1984)
- 13 caregiver talk (Cole & St. Clair Stokes, 1984)
- 14 verbal environment (Chomsky, 1980a)
- 15 parentese (Ramírez-Esparza, García-Sierra & Kuhl, 2014)

(Continued)

There are prizes for those who can dig up any more. Not big prizes, mind you – I'm not a banker.

One might ask if it matters which term one chooses. In fact, it does matter. The people doing the talking (e.g., parent or elder sibling) and the person being addressed (e.g., infant or toddler) can have a significant influence on both the quantity and quality of language used. Probably the most useful term is Child Directed Speech, hence its use in this chapter. For a guided tour through the jargon jungle, see Saxton (2008).

## Characteristics of Child Directed Speech

Child Directed Speech is a special register, which means that it constitutes a distinct mode of speech. The term *register* is borrowed from sociolinguistics, and overlaps with the concepts of style and dialect (Saxton, 2008). Although it is not well defined, the central idea is nevertheless fairly straightforward. We talk in different ways to different people in different settings. Consider how you might converse with the Queen at a palace garden party (converse, mind you – not talk). Now compare that with the kind of chat you might have with a close friend. You would, in all likelihood, adopt a separate register for each occasion. We can establish that CDS is a distinct register by comparing it with *Adult* Directed Speech (ADS) (Hills, 2013). This comparison can provide a scientific control. The ideal study would take a group of adults and record each person in conversation with another adult and also, on a separate occasion, in conversation with a young child. This method allows one to identify what is special or distinctive about Child Directed Speech. Fortunately, this approach was taken by Snow (1972), who provided the first major study in this field, and therefore the first challenge to Chomsky's belief that the input is 'degenerate'.

### Phonology

If you have ever spoken to a baby, you may well have found yourself riding a linguistic roller-coaster. People tend to exaggerate their intonation, producing great swooping curves of sound over an extended pitch range. At the same time, the overall pitch tends to be higher than normal (Garnica, 1977; Stern, Spieker, Barnett & MacKain, 1983; Fernald, Taeschner, Dunn, Papousek, Deboysson-Bardies & Fukui, 1989; Werker & McLeod, 1989). In particular, mothers are especially prone to raise their pitch when the infant shows signs of positive emotional engagement (Smith & Trainor, 2008). Speech also tends to be slower, with syllable-lengthening, longer pauses and fewer dysfluencies (Broen, 1972; Fernald & Simon, 1984; Fernald, 1989; Albin & Echols, 1996). In addition, there is evidence that individual phonemes are pronounced with greater clarity than is the case in Adult Directed Speech. For example, in ADS, the phonemes /t, d, n/ are often not pronounced fully when they are followed by certain phonemes (/b, p, m, g, k/). Instead, they

assimilate to these following phonemes. This means that the sounds take on each other's acoustic properties in certain respects. Infants, by contrast, are more likely to hear canonical, fully pronounced versions of the /t, d, n/ phonemes (Dilley, Millett, Devin McAuley & Bergeson, 2014). Parents may well gravitate towards this manner of speech because infants prefer to listen to it. In fact, some infants have a stronger preference for listening to ADS than others. And those infants who pay particular attention at 12 months have acquired relatively large vocabularies by the age of 18 months (Vouloumanos & Curtin, 2014). From the adult's point of view, ADS provides the best method to grab the infant's attention and, in the process, convey a mood of positive affect (Fernald, 1989). On occasion, this exaggerated intonation is lampooned as a minority pursuit, indulged in only by the privileged Western mothers mentioned above. But this kind of speech has also been observed in languages as diverse as German, Hebrew, Italian, Japanese, Luo (an East African language), and Spanish (see Soderstrom, 2007, for a summary). The phonological adaptations sketched out here figure most prominently during the child's first year. For this reason, some authors refer to Infant Directed Speech (IDS) as a special register, distinct from the Child Directed Speech addressed to older children (Golinkoff, Can, Soderstrom & Hirsh-Pasek, 2015).

## Vocabulary

Adult-child conversation with a toddler tends to be about the here-and-now, rather than topics distant in time or space. This means that the words chosen by the adult are likely to be more easily comprehended by the child. In this vein, there is a marked emphasis on concrete, rather than abstract, concepts. *Cup, juice* and *tree* are far more likely in speech addressed to two-year-olds than *purity, truth* or *beauty*. Moreover, adults tend to place object words at the end of **sentences** and pronounce them relatively loudly, thus giving them special prominence (Messer, 1981). Five topics in particular seem to dominate the conversation: members of the family; animals; parts of the body; food; and clothing (Ferguson, 1977; Ferguson & Debose, 1977). These topics are dictated by the interests of the child, which indicates that, if you want to maintain a toddler's attention, you have to talk about what interests *them*. It is no use launching into a discussion about falling share prices, fiscal prudence and quantitative easing. You will be met with a blank stare. Actually, if you tried that with *me*, you'd be met with a blank stare. As with phonological adaptations, parental lexical choices respond to the needs and interests of the child.

## Morphology and syntax

With regard to **morphology**, the frequency with which children are exposed to particular morphemes is reflected in their own speech (Warlaumont & Jarmulowicz, 2012). Some languages, like Russian, have a dauntingly complex system of word endings. But Russian mothers tend to subvert these complexities and, instead, rely heavily on diminutive forms. Equivalents in English might be diminutive forms like *horsie, doggie* and *duckie*. Russian mothers alternate between diminutive and morphologically simplified forms within the same stretch of conversation (Kempe, Brooks, Mironova, Pershukova & Fedorova, 2007). In so doing, these mothers may

provide an accessible demonstration of the morphological variety typical of Russian, without overwhelming the child with the massive variety witnessed in ADS.

Turning to syntax, sentences in CDS are remarkable for being well-formed grammatically. Although children hear a considerable number of incomplete sentences, these nevertheless comprise legitimate syntactic phrases, for example, **noun phrases** like: *more grape juice; a cup; or another blue one* (Brown, 1973). One survey by Newport et al. (1977) found just one genuine adult error in a corpus of 1,500 utterances. CDS sentences are not only grammatical, but also relatively short (Barnes, Gutfreund, Satterly & Wells, 1983). In jargonese, we could say that the **MLU** of CDS is lower than in ADS. **Mean Length of Utterance** (MLU) provides a rough and ready measure of syntactic complexity, whereby shorter sentences tend to be simpler. The impression of simplicity is confirmed by the relative scarcity of certain complex structures. Thus, Sachs, Brown & Salerno (1976) report few **subordinate clauses, relative clauses, sentential complements and negations** in CDS.

The **subject** of CDS sentences also has a strong tendency to be an **agent**. We encountered the category of subject in Chapter 3. Agent, or ‘doer’ of an action is one semantic role that the subject can take on. In fact, we might argue that ‘agent-as-subject’ is prototypical: *Venus in Venus knocked on our door*, or *Paula in Paula taught me British Sign Language*. Critically, subjects are not always agents: *The oysters were washed down with champagne* or *The meeting came to order at 10 o’clock*. Neither *the oysters* nor *the meeting* are acting as the agent of any action, yet they each function as the subject. Coming back to CDS, consider the advantage to the child if the majority of subjects they hear *are* agents. Eve’s mother produced the following examples, when Eve was 1;7:

Agent as subject of the sentence:

*you’re dancing*  
*Eve can get the banjo*  
*you broke it*  
*shall we change your diaper?*  
*you make a train*

Initially, the child’s experience is confined mostly to just one kind of subject and, moreover, it is the prototypical (agent) subject. By confining sentence subjects to agents, the adult makes the relationship between meaning and grammar especially clear for the young child (Rondal & Cession, 1990). The one-to-one mapping between agents and subjects in CDS may well provide the child with an entry point for discovering the grammatical category of subject, a process known as *semantic bootstrapping* (Pinker, 1984). The complexities involved in a range of different subject types are thus introduced later. In fact, it takes several years before children make the connections between different kinds of sentential subject and treat them as a single grammatical category. Four-year-olds have trouble in this regard, and it is not until the age of nine that children demonstrate full control over the subject category (Braine, Brooks, Cowan, Samuels & Tamis-LeMonda, 1993). It is fascinating to discover, therefore, that the child’s introduction to the subject category, via CDS, is simplified.

## A dynamic register

The register used with children is dynamic. Rather than being a fixed mode of address, adult speech changes continually in concert with the child's developing language. Perhaps the clearest sign of these changes is the shift from infant-directed to child-directed speech. The different names – IDS and CDS – indicate that the changes in adult speech are substantial. But there is no step change from one mode to the other. On a day-to-day basis, the changes are subtle and difficult to detect, but they continue all the way through childhood until a point is reached where the speech addressed to one's offspring can genuinely count as an instance of Adult Directed Speech. Some of the changes over time have been monitored (e.g., Buchan & Jones, 2014), though it must be said that there is far more to learn about the dynamic nature of CDS. One change we do know about concerns tone of voice. From birth to three months, infants respond well to a comforting tone of voice, but subsequently, from three to six months, they come to prefer a more approving tone of voice. Finally, there are signs that, by nine months, infants respond more readily to a directive tone of voice (Kitamura & Lam, 2009). Adults are able to satisfy these changes in infant preferences because they are sensitive to the infant's emotional needs on a moment-to-moment basis (Smith & Trainor, 2008). Snow (1995) refers to these changes over time as a process of 'finetuning' to reflect the continual sensitivity of caregivers to the child's communicative needs. In fact, the notion of finetuning may overstate the case, with some authors arguing that the 'input is only grossly, not finely, tuned' (Hoff, 2004: 924). But the fact that the adult input is tailored in any way at all to the infant's language level deserves our attention.

### EXERCISE 4.1 ADULT DIRECTED SPEECH

Make a short audio recording of a conversation between yourself and a friend. Tell your friend that you are doing this, to guarantee both eternal harmony and a proper regard for the ethics of research (see [www.beta.bps.org.uk](http://www.beta.bps.org.uk) for more information on the ethics of psychology research). Nowadays, you won't need a big reel-to-reel tape recorder; many mobile phones have an audio recording capacity that should suit our rough-and-ready purposes. Try not to be self-conscious and talk about something that you really want to talk about.

Once you have made your recording, transcribe part of your conversation word (and even part-word) for word. Listen with great attention to precisely what was said. We are interested in your speech **performance**, so do not edit out the unintended glitches. You will probably need to listen to each utterance several times before you can get an accurate record. Now consider the following:

*(Continued)*

- If you were a toddler, what aspects of your conversation would be difficult to follow? Consider phonology, vocabulary and syntax. Consider also any errors, hesitations, repetitions and interruptions to the flow.
- How adequate is your language as a model for learning by a toddler?
- Would it be possible to modify the content of your conversation in any way to improve its 'language teaching' potential? If so, what would you change?

## Individual differences and their effects

So far, we have sketched a picture of Child Directed Speech that marks it out quite clearly as a special register, quite different in its characteristics from Adult Directed Speech. In terms of average tendencies, this picture is accurate. But we should also be aware that individual children have different experiences of language. There is considerable variation in both the amount and quality of CDS provided. In this regard, two points are often raised: (1) CDS may be a minority phenomenon, not universally available; and (2) parents who do supply CDS nevertheless differ, in terms of both quantity and quality, in how they talk to children. The assumption that CDS is not available to all children is widely retained in the child language literature. But as we shall see, below, this assumption is very poorly supported, empirically. Far more convincing is the evidence on the second point – individual differences among parents – and this provides the focus in this section.

Hart & Risley (1995) provide the most substantial demonstration that children differ in the sheer amount of language they hear. They grouped parents into three bands according to socioeconomic status (SES), a variable that generally takes into account level of education, income and job prestige. High-SES parents were professionals, Mid-SES parents were working class, while Low-SES parents were generally on public assistance, a form of social welfare provided in the US.

As Table 4.1 reveals, there are substantial differences in the amount of language different children hear. In fact, both the quantity and *quality* of the input varied among groups. High-SES children are exposed not only to more words, but to a greater variety of words also. This group also receive fewer prohibitions and directives: utterances designed to control child behaviour in some way. High levels of parental prohibition are associated with relatively poor language growth on a range of measures, including MLU, diversity and complexity of vocabulary, and use of different language functions (Taylor, Donovan, Miles & Leavitt, 2009). Furthermore, High-SES parents use longer, syntactically more complex utterances with their children. Generally speaking, more talkative parents tends to use a richer vocabulary and express more complex ideas, regardless of SES (Rowe, 2012). And this input has a beneficial impact on the child's own acquisition of complex grammar (Vasilyeva, Waterfall & Huttenlocher, 2008). High-SES children produce complex structures themselves at an earlier stage than Low-SES children (22 months) and this advantage persists over the next 18 months



**Table 4.1** Estimated number of words heard per week by children according to socioeconomic status (after Hart & Risley, 1995)

SES status of parents	Number of words heard per week
High	215,000
Mid	125,000
Low	62,000

or more (see also Hoff, 2006, who reviews the impact of a wide range of social factors on language development). Finally, High-SES parents in China, as measured by parental education level, have children with more advanced vocabulary development (Zhang, Jin, Shen, Zhang & Hoff, 2008).

There are signs that a simple equation – High-SES = ‘high talking’ – may not hold, not even within the United States. Low-SES Spanish-speaking mothers in San Francisco produce 17.5 utterances per minute, on average, when talking with their 18-month-old children (Hurtado, Marchman & Fernald, 2008). This figure compares with an average of 14.6 per minute for another US sample, this time comprising both Mid- and High-SES speakers of English (Hoff & Naigles, 2002). Low-SES mothers are more talkative than High-SES mothers on this comparison. Apart from SES, these groups also differ in terms of the native language spoken and membership of different sub-cultures. These latter factors probably exert separate influences on the amount of parental speech. It is also worth emphasizing that there can be considerable variation in talkativeness *within* SES bands (Hurtado et al., 2008). The children of talkative mothers heard seven times as many words, and three times as many *different* words, as children of less talkative mothers. In fact, individual parental loquaciousness predicts the child’s language development better than the SES group they belong to (Weisleder, Otero, Marchman & Fernald, 2015). Regardless of SES, lexical frequency and lexical diversity co-occur (Song, Spier & Tamis-LeMonda, 2014). And both of these factors have an impact on the child’s vocabulary development, with children of talkative mothers developing larger vocabularies (Hart & Risley, 1995; Hoff & Naigles, 2002; Hurtado et al., 2008; Fernald & Weisleder, 2015). In a similar vein, children whose parents engage in more episodes of joint attention and shared book reading develop larger vocabularies by the age of six years (Farrant & Zubrick, 2013).

Hurtado et al. (2008) report a further consequence of being talkative with one’s child. They found that the children of talkative mothers were more efficient at processing speech. Pictures of two familiar objects were presented side by side, and one of them was named. Children of talkative mothers looked more quickly to the named target. Lexical knowledge and processing efficiency work together in a synergistic fashion. As vocabulary grows, so too do the processing skills needed to make fine discriminations among words on the basis of their phonological, morphological and semantic characteristics. It makes sense, therefore, that children with large vocabularies are better able to learn words on a single exposure (Gershkoff-Stowe & Hahn, 2007; see also Chapter 6 for more on so-called *fast mapping*).

Overall, we have observed a tendency for High-SES parents to be relatively talkative. It turns out that they also use more *gestures*, with a concomitant beneficial impact on later child vocabulary learning (Schmidt, 1996; Rowe & Goldin-Meadow, 2009a, 2009b; Hall, Rumney, Holler & Kidd, 2013; Stanfield, Williamson & Özçalışkan, 2014). But why should wealthy, well-educated people chatter and gesticulate so much? The answer is not yet clear, though Rowe (2008) does report that *attitudes* towards child-rearing practices differ according to SES status. High-SES parents hold beliefs that reflect the information on offer from textbooks, experts and paediatricians. Of course, now that you've read this chapter you too can feel perfectly justified, when you next meet a toddler, in jabbering on at ten to the dozen while waving your arms about like a windmill.

## Child Directed Speech: Summary

If one was asked to design a language course for infants, one might very well come up with something resembling Child Directed Speech. The numerous modifications on display are, without fail, geared towards simplifying and clarifying the object of learning. As a language course, CDS benefits from confining the syllabus to topics that interest the learner. We might also point to the dynamic nature of CDS, because, like any well-designed course, it presents the child with a graded series of lessons. Or, more subtly, the child elicits from parents the input that meets their language learning needs. This view is expressed by Bohannon & Warren-Leubecker (1985: 194), who observe that, 'since the complexity of speech addressed to children is largely determined by cues from the children themselves . . . , one might think of language acquisition in this view as a self-paced lesson'. One thing is certain. The input to the child is not, as assumed by Chomsky (1965), degenerate. At the same time, there is variation in the amount and quality of CDS available, with concomitant effects on the rate of language development. Evidently, Child Directed Speech has a facilitative influence on child language development. But facilitative is not the same as necessary. Many researchers assume that CDS cannot be necessary for language development, because they believe that CDS is not supplied to all children everywhere. We shall consider the validity of this assumption. First, though, we turn our attention to the neglected topic of interaction. CDS does not simply comprise a special set of language forms. Language is presented to the child via particular kinds of interaction, including imitation. We begin, though, by considering what happens when the child has linguistic input, but no interaction, at their disposal.



### DISCUSSION POINT 4.1 THE INPUT IN LANGUAGE LEARNING

Consider your own experience of learning a second language.

- What age did you start learning?
- What kind of input and/or teaching did you receive?

- What are the similarities in the input available to both second language learners and toddlers acquiring their first language?
- What are the differences?

Hop back to Chapter 3 to help with the following two questions:

- To what extent can differences in the input explain differences in the outcome of learning, when comparing native first language learning with adult second language learning?
- Did the age at which you started learning have an effect on the outcome?

## Lack of interaction: Can children learn language from television?

We can demonstrate the difference between input and interaction by switching on the TV. All of a sudden, the child is exposed to linguistic input, but without the benefit of a conversational partner to interact with. We can therefore investigate language acquisition in the absence of interaction. On the whole, the results are disappointing. It has been found that before the age of two years, children are not capable of learning new words from television (Kuhl, Tsao & Liu, 2003; Mumme & Fernald, 2003; Anderson & Pempek, 2005; Krcmar, Grela & Lin, 2007). And if we compare the power of TV with live interaction, then live interaction is clearly superior. In this vein, Patterson (2002) showed that children aged 21–27 months learned new words from a shared book reading activity, but none at all from TV viewing. Moreover, television has no impact on second language development in young children (Snow, Arlman-Rupp, Hassing, Jobse, Joosten & Vorster, 1976). The limitations of television are especially clear in the case of Jim, a hearing child born to deaf parents (Sachs, Bard & Johnson, 1981). Jim's only exposure to English was via television, which he spent a lot of time watching. By the age of 3;9, Jim's language was not merely delayed, it was distinctly odd:

*This is how plane  
I want that make  
House chimney my house my chimney*

Rather like the case of Genie discussed in Chapter 3, Jim was able to learn some words, but very little about how to put words together to form grammatical sentences.

Beyond the age of two years, it *is* possible to learn some vocabulary from TV viewing (Rice & Woodsmall, 1988; Barr & Wyss, 2008). But it depends what you watch. Programmes that are not designed expressly for toddlers have no discernible effect (Rice, Huston, Truglio & Wright, 1990). Even some programmes that *are* designed for young children do not have much impact.

For example, regular viewing of *Teletubbies* from the age of six months is associated with relatively low vocabulary scores at three years of age (Linebarger & Walker, 2005). If you're a *Teletubbies* fan, then you will not be surprised by this. You will probably also have a small vocabulary. *Teletubbies* does not contain very much language and the characters are prone to talk in a rather bizarre, fake kind of 'baby talk'. In contrast, other programmes, including *Dora the Explorer*, *Blue's Clues* and *Dragon Tales*, did have a beneficial effect on vocabulary and expressive language scores (Linebarger & Walker, 2005; cf., Uchikoshi, 2005). In one study, children aged 2;6 learned new words from video only when there was some form of reciprocal social interaction with an adult, either on or off screen (O'Doherty, Troseth, Shimpi, Goldberg, Akhtar & Saylor, 2011). Given an optimal programme style, it is perhaps not surprising that three-year-olds can learn some vocabulary from television. By this age, language acquisition has long since taken off in an exponential fashion, with rapid growth in both vocabulary and syntax (Bates, Dale & Thal, 1995). The child is therefore increasingly well equipped, both cognitively and linguistically, to infer word meanings for themselves, even in the absence of interactive support.

Television is not the only source of non-interactive input that might influence the child. Overheard conversations, radio and song lyrics all expose the child to linguistic information. There is some indication that children as young as 18 months can learn new words that they have overheard being used by adults (Akhtar, 2005; Floor & Akhtar, 2006; Gampe, Liebal & Tomasello, 2012). But as with television, the language acquired is confined to a limited range of vocabulary items, at an age when vocabulary learning has already taken off. Somewhat older children (mean age 27 months) can learn rudimentary aspects of word meaning in the absence of social and observational cues (Arunachalam, 2013). However, the amount of speech overheard by the child does not predict vocabulary size, whereas the amount of speech targeted specifically at them does (Shneidman, Arroyo, Levine & Goldin-Meadow, 2013; Weisleder & Fernald, 2013). Of course, many children grow up in a world where the TV is switched on for hours at a time as a backdrop to daily life, thus exposing them to a large amount of overheard language. However, constant background TV interferes with adult-child interaction, with a negative effect on subsequent vocabulary growth (Masur, Flynn & Olson, 2016).

Chomsky (1959: 42) suggested that 'a child may pick up a large part of his vocabulary and "feel" for sentence structure from television'. But most of Chomsky's early assertions about language acquisition are the result of armchair speculation, not empirical enquiry. And most of them, like this one, are wrong. In the nativist approach, the role of the linguistic environment is reduced to a matter of simple and limited exposure to key linguistic forms. The assumption is that limited exposure of this kind will suffice to trigger language acquisition (Lightfoot, 1989, see also Chapter 8). In principle, therefore, the nativist might be content to leave the child, unaccompanied, in front of the TV screen. But as any guilty parent knows, if the child must watch TV, it is better that someone watch with them (Naigles & Mayeux, 2000; Masur & Flynn, 2008). In essence, parents should consider TV viewing in the same way as shared book reading – as an opportunity to interact with the child and provide the framework for extending the child's current state of linguistic knowledge (Vygotsky, 1934/1962; Cameron-Faulkner & Noble, 2013). Left alone, with no more than exposure to linguistic forms, the child cannot acquire syntax. Interaction is essential.

## Imitation

We started out this chapter on the Clapham Omnibus, where we heard the common sense view that children learn language from their parents. Even if we accept this view, we still need to know *how* children learn from parental input. To the man on the bus, and many like him, the answer is, once again, entirely obvious: children learn language by imitating their parents. Surprisingly, though, researchers have largely ignored imitation as a serious factor in child language acquisition. Relatively little research effort has been devoted to the issue. Moreover, imitation rarely figures in theoretical debates and does not even feature as an index topic in several recent books in the field (e.g., Cattell, 2000; Karmiloff & Karmiloff-Smith, 2001; Clark, 2003; Hoff & Shatz, 2007). It was not always thus. Imitation of language is mentioned several times by Tiedemann (1787) (see Appendix 1). Tiedemann observed a child of six months and noted that ‘his mother said to him the syllable “Ma”; he gazed attentively at her mouth, and attempted to imitate the syllable’ (see Murchison & Langer, 1927: 218). Incidentally, infants who are good at observing the mother’s mouth (and following her gaze) acquire vocabulary with particular alacrity (Tenenbaum, Sobel, Sheinkopf, Malle & Morgan, 2015).

In this section, we shall demonstrate that imitation, as a special form of interaction between parent and child, is fundamentally important in the study of language acquisition. But before we get started, a note on terminology: I will mostly use the term *imitation* in this section, but when you access the child language literature directly, you will find that *repetition* is often preferred (e.g., Gathercole, 2006; Clark & Bernicot, 2008). The points to be made are not substantively affected in the alternation between these two terms. Repetition can be seen as a particular kind of imitation, one that is often associated with language.

## Linguistic creativity: Children make their own sentences

As mentioned, imitation is often downplayed in theories of language acquisition because the child possesses *linguistic creativity*. As speakers of a language, we create genuinely novel sentences all the time, putting words together in sequences that have not been uttered before and which may never occur again. We can do this because grammar allows for infinity in the number of different sentences we can put together, even though the system of grammatical rules is itself finite (von Humboldt, 1836/1988; Chomsky, 1965). Two consequences follow from this observation that have a direct bearing on imitation: (1) it is logically impossible to imitate an infinite number of sentences; and (2) we could not rely on imitation as the source for producing our own sentences. Think how odd it would be to sit around waiting for someone to say a sentence, so that you, as a learner, got an opportunity to use it for yourself, through imitation. You might literally have to wait forever for the right sentence to come along. Not much fun if the sentence is: *Can you tell me where the toilet is, please?* Even if the child were adept at imitating each and every sentence they heard, it would not provide the information needed, in and of itself, to construct new sentences for themselves. In other words, the child cannot imitate grammar (the rules), only the output from those rules (sentences). We will expand on this point in Chapter 8. For now, we can confirm that imitation of sentences does not provide a feasible route into the acquisition of syntax.

## Skinner and Chomsky on imitation

It is often wrongly assumed that Chomsky (1959) dismissed imitation as part of his campaign against the behaviourist approach to language acquisition. Chomsky (1959) provides a book review of *Verbal Behavior* (1957), written by B.F. Skinner, the doyen of twentieth-century behaviourism. Ironically, this book review has been far more widely read than the actual book, in which Skinner argued that child efforts to speak are rewarded by parents. Skinner based his position on a form of learning studied extensively by behaviourists, termed *operant conditioning*. Each time the child produces an utterance that comes close to sounding like an acceptable word or sentence, the parent offers a ‘reward’ in the form of praise or encouragement. On successive occasions, closer approximations to the adult model receive yet further parental rewards. Thus, operant conditioning relies on the learner producing a linguistic behaviour that is progressively shaped through rewards, until the desired behaviour is achieved. Punishments can also be used to ‘dissuade’ the learner, when behaviours veer away from the desired learning outcome. Operant conditioning is very different from imitation. In fact, Skinner had very little to say on the subject of imitation, other than to reject the idea that humans have an instinct to imitate. Instead, he preferred the phrase *echoic behaviour*, whereby a ‘response generates a sound-pattern similar to that of the stimulus. For example, upon hearing the sound Beaver, the speaker says Beaver’ (Skinner, 1957: 55). Skinner does not call this behaviour imitation, on the grounds that there is ‘no similarity between a pattern of sounds and the muscular responses which produce a similar pattern’ (ibid.: 59). This is an astute point, although it does no violence to standard definitions of imitation. For most people, Skinner’s ‘beaver’ example *is* a case of imitation.

The champion of imitation in the Skinner–Chomsky exchange was Chomsky (1959: 42), who insisted that ‘children acquire a good deal of their verbal and nonverbal behavior by casual observation and imitation of adults and other children’. Elsewhere, Chomsky talks about children’s ‘strong tendency to imitate’ (ibid.: 43) and castigates Skinner for rejecting the ‘innate faculty or tendency to imitate’ (ibid.: ff51). Unfortunately, this clear position has been completely reversed in the re-telling. Some recent authors now suggest that it was Chomsky (not Skinner) who rejected imitation as a significant factor (for example, Cattell, 2000; DeHart, Sroufe & Cooper, 2000; Stilwell-Peccei, 2006). In this vein, Owens (2008: 33) asserts that ‘an overall imitative language acquisition strategy would be of little value, according to Chomsky (1957), because adult speech provides a very poor model’. This not only misrepresents Chomsky on imitation, it gets the date wrong (there is nothing at all on imitation in Chomsky, 1957). Alarm bells should ring for students at this point: read the original sources for yourself, if you possibly can. None of this would matter, perhaps, if our initial critique of imitation, *vis-à-vis* linguistic creativity, was the last word on the subject. Arguably, though, there is more to say and far more to learn about the function of imitation in language acquisition.

## Imitation as a mechanism in cognitive development

The definition of imitation is less straightforward than it might seem. A simple definition might be: *the reproduction of another person’s behaviour*. In the context of language, this could mean

that, if you first say something, I would repeat it back verbatim. But no matter how good a mimic I am, I will not be able to reproduce precisely your accent, your voice quality, the emotions conveyed in your tone of voice, the speed and rhythms of production, nor the fine-grained acoustic detail in the way each word and phrase is articulated. If you nevertheless recognize that I am imitating you successfully, then that recognition must derive from some abstraction of properties common to your model and my response. Furthermore, this abstraction requires the integration of information from different sensory modalities. As Skinner (1957) observed, the act of producing a burst of speech sound is very different from the act of listening to it, prior to attempting one's own production. Cross-modal co-ordination is therefore required to bridge the gulf between perception and performance (Meltzoff, 2002).

The act of imitation is complex. But these complexities are overcome, to some extent, because the ability to imitate may well be inborn. Infants can imitate adult tongue protrusion within minutes of birth (Meltzoff & Moore, 1983). Within the first week, they can even imitate an adult who raises either one or two fingers (Nagy, Pal, & Orvos, 2014). This ability is all the more remarkable because the newborn infant has not yet seen their own face (Meltzoff & Moore, 1997). In other ways, too, infants have been described as 'prolific imitators' (Marshall & Meltzoff, 2014). The genetic basis of imitation has been challenged recently (Cook, Bird, Catmur, Press & Heyes, 2014). But none deny that the primate brain possesses a dedicated functional capacity for imitation, operating via so-called *mirror neurons*. Research on monkeys shows that these special neurons (in the premotor cortex) discharge both when an action is observed and also when it is performed (Gallese, Fadiga, Fogassi & Rizzolatti, 1996). In monkeys, the sight of another monkey grasping, placing or manipulating an object will cause mirror neurons to fire. Mirror neuron activity is associated with the monkey's own motor response, which often constitutes an imitation. Mirror neurons therefore form a link between an observer and an actor. Mirror neurons have also been discovered in the human brain. At one point, it was believed that mirror neurons could be detected in Broca's area (Rizzolatti & Arbib, 1998), an area in the left hemisphere long known for its importance in the motor planning of speech and probably also in the processing of syntax (Oblor & Gjerlow, 1999). However, more recent studies locate the human mirror neuron system more accurately in a region known as *premotor BA6* (a catchy name, I think you'll agree) (Cerri et al., 2015). Whatever the precise location of mirror neurons, their existence points to the intrinsic importance of imitation in human behaviour.

## Imitation: Who, when and how?

In the study of imitation, three factors demand attention: (1) the actors: who is imitating whom? (2) the time lag: how long is the delay between model and imitation? and (3) precision: how closely does the imitation match the model? With regard to the actors, imitation can work both ways. The child can imitate the adult, but equally well, the adult can (and does) imitate the child (Olson & Masur, 2012). We will consider one form of adult imitative behaviour in our discussion of corrective input, below. The second factor to consider concerns the time lag between presentation of a model and its subsequent imitation. Imitation can be either immediate or

deferred (Stern, 1924). It is easy to establish that an imitation has occurred when it is immediate. But imitation may also be deferred until quite some time after presentation of the model (Meltzoff, 1988). In this case, researchers need to be more resourceful in confirming that a given behaviour does indeed constitute imitation. Perhaps for this reason, child language research on deferred imitation is limited. But there is some evidence that children can imitate utterances first presented several hours or even days earlier (Clark, 1977; Moerk & Moerk, 1979; Snow, 1981). Logically, of course, every time a child uses a new word for the first time, in the immediate absence of a parental model, we witness a case of deferred imitation. The child must have heard each word spoken by a parent at some point previously. Imitation must therefore play an important role in lexical development.

A third factor that has proven important is the fidelity of the imitation to the original model. As noted above, it is pretty much impossible to imitate someone else's verbal behaviour precisely. Nevertheless, most researchers would describe an imitation as 'exact' if the same words are reproduced in the same order. It turns out that this kind of verbatim repetition is rare, accounting for no more than 10 per cent of the child's imitative behaviour (Snow, 1981). It is far more common for the child to incorporate just part of an adult utterance into their own response, which may also embody further additions, reductions or modifications. Strictly speaking, therefore, the child imitates selectively, as shown in the following examples from Nathaniel aged 2;3–2;7 (Snow, 1981):

- Mother: *A Dutch house.*  
 Nathaniel: *Nathaniel Dutch house.*
- Mother: *What's this?*  
 Nathaniel: *What's this a boat.*
- Mother: *The pigs are taking a bath.*  
 Nathaniel: *Taking a bath and make juice.*
- Mother: *You like jingle bells.*  
 Nathaniel: *Like other jingle bells.*

Imitations of various kinds are frequent in adult–child conversation. Clark and Bernicot (2008) analysed nine hours of data from 41 French children and report that both children and adults are very repetitive, with adults having a slight edge on their children (Table 4.2).

Adults also repeat *themselves* a great deal, tending to rely on a restricted repertoire of verbal routines of the form: *Look at NP*, *Here's NP* and *Let's play with NP* (where NP stands for **noun phrase** like *the dog* or *Auntie Mary*). These routines are used to introduce new information, with the noun in the noun phrase often being produced with exaggerated intonation and heavy stress (Broen, 1972). New information appears sentence-finally 75 per cent of the time in CDS, as against 53 per cent for ADS (Fernald & Mazzie, 1991). This is significant, because new information is more exposed in sentence-final position (Slobin, 1973), and young children respond more accurately to new information presented in this way (Shady & Gerken, 1999).



**Table 4.2** Rates of repetition by mother and child reported by Clark & Bernicot (2008)

Mean age	Repetition rate (per minute)	
	Mother imitates child	Child imitates mother
2;3	1.21	0.51
3;6	1.45	0.43

### Individual differences in imitation

Research is beginning to show that our ability to imitate varies and, moreover, that imitation ability has an impact on language development. This topic has been investigated as part of the Twins Early Development Study in the UK (McEwen, Happé, Bolton, Rijdsdijk, Ronald, Dworzynski & Plomin, 2007). McEwen et al. (2007) examined more than 5,000 twins for their ability to imitate non-verbal behaviours like gestures and facial movements. They found that good non-verbal imitators had higher vocabulary scores. This finding is intriguing because the link is between *non*-verbal imitation and language development. McEwen et al. (2007) also used their twin sample to examine the genetic basis of imitation. By comparing identical twins with non-identical twins, they could estimate the **heritability** of imitative capacity (Plomin, 1990). They found that 30 per cent of the variance in imitative skill could be attributed to genetic factors. This is a fairly modest figure and means that environmental factors play an important role in distinguishing between good and poor imitators. It remains for future research to determine more precisely how the child's upbringing affects their capacity to imitate. Perhaps some parents encourage this kind of behaviour through their own example, by providing high levels of imitations themselves.

Individual differences also exist in *verbal* imitative ability (Bloom, Hood & Lightbown, 1974). An important measure of these differences is the *nonword repetition task* (Gathercole, 2006). Children are presented verbally with a series of nonsense words, like *prindle*, *frescovent* and *stopograttic*, and are asked to repeat each one back to the experimenter. The ability to imitate (or, as the authors prefer, repeat) these words is highly correlated with children's vocabulary level at four, five and six years (Gathercole, Willis, Emslie & Baddeley, 1992; Hoff, Core & Bridges, 2008). Good nonword repetition skills are also found in children who produce relatively long, syntactically complex utterances (Adams & Gathercole, 2000). At the other end of the spectrum, children with serious language impairments do very poorly at repeating back to another person polysyllabic nonwords (Bishop, Adams & Norbury, 2006). The nonword repetition task is generally discussed within the context of individual differences in working memory capacity (Archibald & Gathercole, 2007). But performance on this task also relies on the child's imitative capacity. It is possible, then, that imitative skill is partly constrained by working memory capacity.

Masur & Olson (2008) provide another example of how individual differences in imitative ability have an impact on child language development. These authors examined imitation of both

verbal and non-verbal behaviours, by mothers and children. In a longitudinal design, children were tested at four different points between the ages of 10 and 21 months. Mothers imitate their infants' behaviours and infants demonstrate an increasing responsiveness to, and awareness of, being imitated. In response to being imitated by an adult, the child may repeat the imitation back, in return. Thirteen-month-olds who engaged more in this chain of imitation were more lexically advanced at 21 months. And generally speaking, infants who were most responsive to maternal imitations at 10 months were also those children with more advanced vocabularies at 17 and 21 months (see also Olson & Masur, 2015). In a similar vein, verb learning was enhanced in children aged 30 and 36 months when they actively imitated the action associated with a verb, rather than just passively observed it being performed (Gampe, Brauer & Daum, 2016).

Another source of individual differences in imitation is the *motivation* of the child to engage with other people. Imitation is a fundamentally social behaviour, one that assumes a strong impulse to interact with other people. But this impulse is weaker among certain individuals, including those with autism. Of interest, children with autism do not perform well on non-verbal imitation tasks (Vivanti, Nadig, Ozonoff & Rogers, 2008). In fact, these children *can* copy another person's behaviour, but their motivation to do so seems to be depressed by a relative lack of interest in the goals and intentions of other people. Even within this population, though, there is considerable variation in the rate at which children imitate other people. Significantly, among children with autism, the ability to imitate simple sounds at the age of three years predicts general spoken language ability at the age of five years (Thurm, Lord, Lee & Newschaffer, 2007). Good imitators turn out to be good talkers.

Generally speaking, we see that individual differences in imitative behaviour, both verbal and non-verbal, have an impact on language development. But despite individual differences, we have also seen that imitation is a fundamental human capacity. It has a partly genetic basis and exploits a dedicated neurological resource in mirror neurons. With regard to language acquisition, we have argued that it deserves our close attention, as a critical form of interaction between adult and child. In the next section, we will focus on imitation of the child by the adult and consider how it might influence language acquisition. In particular, we consider its potential as a form of correction for child grammatical errors.

## Corrective input

We begin this section by describing a special form of adult imitation, the recast. In what follows, we zoom in on one particular kind of adult recast that might function as a form of corrective input for child grammatical errors. More broadly, we consider the significance of findings on corrective input for theories of child language acquisition.

### Recasts: Adult repetition of the child

Adult imitation of child speech is often embellished in one way or another. In fact, repetitions with minor variations to the original utterance are the hallmark of adult-child discourse. This kind of adult imitation is often referred to as a *recast*, and was first studied by Roger Brown and his students (Brown & Bellugi, 1964; Cazden, 1965). The following examples are from Brown (1973):

- Eve: *Eve get big stool.*
- Mother: *No, that's the little stool.*
- Eve: *Milk in there.*
- Mother: *There is milk in there.*
- Eve: *Turn after Sarah.*
- Mother: *You have a turn after Sarah.*

Recasts fall out naturally from conversation with a two-year-old. It is unlikely that adults consciously recast child speech, but they do it a lot (see below). The prime function of recasts is to maintain the flow of conversation with a partner who is cognitively and linguistically immature. This is achieved, in part, by reproducing some or all of the child's own words and structures. In so doing, the adult increases the chance of being understood by the child. And, of course, the conversation topic is of interest and relevance to the child, since it follows the child's lead. In essence, the adult adopts the linguistic framework supplied by the child, so any additions or changes they introduce will place the minimum burden on the child's processing and memory resources. In consequence, it is likely that any new or unfamiliar language will be more readily assimilated by the child. In this vein, studies with adults have shown that grammatical forms that have just been used by another speaker are more easily accessed and produced (for example, Kaschak, Loney & Borreggine, 2006). The value of recasts has been established in numerous studies that demonstrate their association with language growth, in both typically and atypically developing children (for example, Seitz & Stewart, 1975; Nelson, Denninger, Bonvillian, Kaplan & Baker, 1984; Hoff-Ginsberg, 1985; Forrest & Elbert 2001; Eadie, Fey, Douglas & Parsons, 2002; Swensen, Naigles & Fein, 2007). Recasts are one sign that adults are being responsive in conversation with children, and parental responsiveness in general is closely linked with language development (Tamis-LeMonda, Kuchirko & Song, 2014).

## The 'no negative evidence' assumption

All language learners make errors. In fact, errors are the hallmark of language development. They demonstrate that a recognized, mature end-state has not yet been reached. From about the age of 15 months, when the child begins to put two or more words together in multi-word utterances, very little of the child's output looks adult-like in its grammatical form:

Eve aged 1;6 (Brown, 1973):

- more cookie
- Mommy read
- Fraser water?
- that radio (following the mother's question: *What is that?*)
- dollie celery

All typical children produce errors. But eventually, and just as surely, children retreat from error as they acquire an adult-like, mature knowledge of grammar. The problem, then, is to explain how errors are expunged. The most obvious answer, explored below, is that parents correct their children's errors. But many child language researchers reject this suggestion. Nativists, in particular, have argued that the child receives no help from the linguistic environment in eradicating errors (for example, Weissenborn, Goodluck & Roeper, 1992). In nativist terms, the child receives 'no **negative evidence**', that is, no information about what is, and is not, grammatical. Adherence to this assumption has a radical effect on one's view of the task that faces the language-learning child. If there is no guidance in the input on grammaticality, how does the child acquire this knowledge? The nativist answer is that this knowledge must be innate and will, at some point in development, come to the child's rescue (see Chapter 8). Many non-nativists have also expressed support for the 'no negative evidence' assumption (Ambridge, Pine, Rowland & Young, 2008). These researchers rely on the child's general learning mechanisms to explain how children retreat from error (see Chapter 9). In this section, though, we will argue that the 'no negative evidence' assumption is unfounded. There is evidence that parents *do* correct their children's grammatical errors.

We begin our review of the evidence by returning to the adult recast. Brown & Hanlon (1970: 197) were the first to recognize the corrective potential of adult recasts with their observation that 'repeats of ill-formed utterances usually contained corrections and so could be instructive.'

Eve aged 1;6 (Brown, 1973)

Eve: *Want lunch.*

Mother: *Oh you want lunch then.*

Eve: *Mommy gone.*

Mother: *Mommy's gone.*

Eve: *Fraser coffee.*

Mother: *Fraser's coffee.*

Brown & Hanlon's suggestion concerning the corrective potential of recasts has been ignored for many years. Instead, the focus has been on a different kind of adult response, also investigated by Brown & Hanlon (1970), which they call a Disapproval. Behaviourist in inspiration, it was thought that Disapprovals might function as a form of corrective input. The idea was that parents might explicitly signal their displeasure with ungrammatical child sentences with injunctions like *no*, *that's wrong*, or *don't say that*. But it turned out that Disapprovals were not contingent on child grammatical errors. Instead, Disapprovals were contingent on the *meaning* of child speech (*No, that's a purple sweater, not a blue one*). The influence of Brown & Hanlon's study has been extensive. Researchers continue to cite the evidence on Disapprovals as evidence that parents do

not correct child errors (Tomasello, 2003). But there is more than one way to provide corrective input. Disapprovals are just one possibility, a rather implausible one at that. Far more promising are the special recasts – ‘repetitions with corrections’ – that Brown & Hanlon (1970) observed, but unfortunately neglected. Attempts to revive interest, beginning with Hirsh-Pasek, Treiman & Schneiderman (1984), have not been universally welcomed (Tomasello, 2009). But we shall give them more leeway than is typical in what follows.

## Contrastive discourse

Look again at the three exchanges between Eve and her mother, above. In each case, Eve’s utterance is ungrammatical. And in each case, Eve’s mother provides grammatical versions of the erroneous elements in Eve’s speech. As you can see, the adult response, in each case, is a particular kind of recast. Recall that recasts preserve some of the child’s original words, but changes are also introduced. The adult ‘expands, deletes, permutes, or otherwise changes the ... [child utterance] while maintaining significant overlap in meaning’ (Bohannon, Padgett, Nelson & Mark, 1996: 551). Hence, recasts can take many forms. When it comes to corrective input, though, we are interested only in those recasts where the change constitutes the provision of a correct form directly following a child error. It is possible that this kind of recast counts as a form of negative evidence for the child. Negative evidence is a topic that I have investigated myself. The following examples come from a diary study I conducted with my son Alex, when he was four-years-old (Saxton, 1995):

Alex: I had all my breakfast and I **drinked** up all the milk

Matthew: You **drank** the whole bowl!

Alex: Listen to me! I was **talked** first

Matthew: You weren’t **talking** first!

Alex: I’m **easy to eat** you up.

Matthew: You can **eat** me up **easily**?

Alex: All **by her own**. All **by her own**. All **by her own**.

Matthew: All **by herself**?

Incidentally, **bold** has been used to highlight errors and correct alternatives. It does not indicate stress, which may well lie elsewhere. To explain how the child might identify the corrective potential in these responses, I formulated the so-called *direct contrast hypothesis* (Saxton, 1997). The prediction is that the correct adult form is especially conspicuous when it directly follows a child error. In the first example above, Alex uses *drinked*, but I counter this directly with the correct version, *drank*. The contrast between the two forms is therefore especially noticeable. It is predicted that the child will recognize their own selection (in this case, *drinked*) as erroneous, and furthermore, will recognize that the adult alternative (*drank*) constitutes the appropriate form.

It has been discovered that contrastive discourse of this kind is very common. In one study, as many as 65 per cent of all child errors met with this kind of correction (Chouinard & Clark, 2003). A large number of other studies also report high levels of contrastive discourse (for example, Hirsh-Pasek et al., 1984; Demetras, Post & Snow, 1986; Penner, 1987; Bohannon & Stanowicz, 1988; Morgan & Travis, 1989; Moerk, 1991; Farrar, 1992; Furrow, Baillie, McLaren & Moore, 1993; Post, 1994; Morgan, Bonamo & Travis, 1995; Strapp, 1999; Strapp & Federico, 2000; Saxton, Backley & Gallaway, 2005). This high prevalence is perhaps not surprising. Young children produce numerous errors, whereas adults do not. The chances are therefore high that errors and their correct counterparts will often be found sitting side-by-side in adult-child conversation.

It is one thing to show that negative evidence is supplied to the child. We also need to determine whether it works. That is, do children pick up on the corrective information on offer, and use it to modify their own developing grammars? If corrective recasts really do function as a form of negative evidence, the child should respond to them by adopting the correct forms offered by the adult. There is evidence that children can, in fact, do this. Some more examples from Alex:

Alex (aged 4;1–4;9)

Alex: *It's even **gooder** than anything.*  
*It's **gooder**, isn't it?*

Matthew: *Yes, it is **better**.*

Alex: ***Better**, yeah.*

Matthew: *What did he do?*

Alex: *He wiped **him**.*

Matthew: *He wiped **himself**.*

Alex: *Yes, he wiped **himself**.*

Alex: *He's got **little nice** feet.*

Matthew: *Oh, he has got **nice little** feet.*

Alex: *Yes, he's got **nice little** toes.*

Alex: *It's **bored** of being on the bike.*

Matthew: *It's not **boring**.*

Alex: *Yes, it's **boring** on the bike.*

Alex: *That's what happens to Tarzan Dog. He **gets falled over** by Tarzan Man.*

Matthew: *I **make him fall over**, do I?*

Alex: *What?*

Matthew: *I **make him fall over**, do I?*

Alex: *Yes, you **make Tarzan Dog fall over** with your sword.*

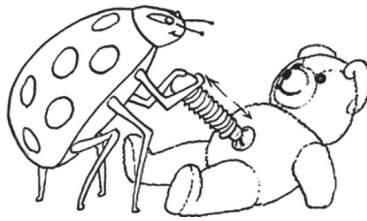
If you have ambitions to be a child language researcher, then it helps to breed your own source of data. Thanks, Alex. We can see in these examples that Alex is sensitive to the linguistic form (not just the meaning) of my utterance. He is capable, on some occasions at least, of switching, from his own erroneous uses to the ones offered by me, in the form of a direct contrast. Experiments and studies using naturalistic conversational data confirm that children are responsive to this kind of correction (Saxton, 1997; Saxton, Kulcsar, Marshall & Rupra, 1998; Saxton, 2000; Strapp, Bleakney, Helmick & Tonkovich, 2008; Laakso & Soininen, 2010; Holtheuer & Rendle-Short, 2013; see also Box 4.2). It has also been shown that the child's immediate responsiveness to negative evidence is not ephemeral: the beneficial effects on the child's grammar can be observed, in some cases, several weeks later (Saxton et al., 1998). In other cases, effects are apparent for some structures, but not for others (Saxton, Houston-Price & Dawson, 2005). Teasing apart the effects of one kind of adult response from all other sources of input influence is no easy matter, empirically. What evidence we have, though, is broadly supportive of the idea that negative evidence can facilitate the acquisition of more adult-like states of grammatical knowledge.

#### BOX 4.2 NOVEL WORDS (SAXTON, 1997)

The beauty of novel words is that one knows exactly how many times children have heard them and in what context. The novel words in the study described here are **irregular past tense verbs** (Saxton, 1997). Children are first taught the present tense of verbs like *stleep* and *pell*. It is important to give children lots of practice at recognizing the new words and getting their tongues round them in different forms (*pell*, *pells*, *PELLING*). A schedule of multiple training sessions – little and often – works well. The characters shown here were modelled on glove puppets that the children used to act out the verbs.

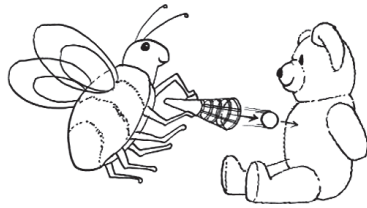
The next stage was to elicit a past tense form from the child. This was done by showing a video featuring the familiar puppet characters. A dragon is shown asleep under a tree, snoring loudly. To stop him snoring, one of the characters suggests they sneak up on the dragon and wake him by performing one of the actions. The poor dragon wakes up, roaring loudly, at which point the video is paused and the child is asked: *What happened?* One has thus created a past tense context. The child has never heard the past tense form of these verbs, so they have no choice but to treat the verbs as regular: *He pelled his nose*. But little do they know: these are irregular verbs. We have not only induced a past tense form, but an error also.

(Continued)



**sty / stought**

prodding action performed with a plastic concertina that makes a honking noise (cf., *buy / bought*)



**streep / strept**

ejection of a ping pong ball from a cone-shaped launcher towards a target (cf., *creep / crept*)



**pell / pold**

a beanbag on the end of a string is swung like a bolas at the target (cf., *sell / sold*)





**pro / prew**

twisting motion applied with a cross-ended stick (cf., *throw / threw*)



**jing / jang**

a beanbag is catapulted from a spoon at a target (cf., *sing / sang*)



**neak / noke**

repeated clapping motion in which target is trapped between the palms (cf., *speak / spoke*)

*(Continued)*

This means that the child can be corrected:

Child: He *pelled* his nose.

Adult: Oh yes, he *pold* his nose.

Alternatively, the correct irregular past tense form can be modelled as soon as the video is paused, before the child has had a chance to make an error: *Oh look! He pold his nose*. In both cases, the adult models the correct past tense form. The difference is simply that in one condition only, the correct model is supplied in a contrastive way, directly following a child error. If direct contrasts do indeed function as a form of correction for the child, then they should be more likely to reject their own, erroneous version in favour of the correct adult version. And this is precisely what was found.

Note that each novel word sounds like a genuine word (they are phonologically plausible). And the meaning of each verb is also novel. This prevents any form of competition with meanings that already exist in the child's repertoire. Novel words have a long history in child language research (Berko, 1958). As noted, control over the input is their chief virtue. A major limitation is that it is usually only possible to expose children just a handful of times to novel words. Practical considerations prevent children being exposed hundreds (or even thousands) of times, as with many real words. Nevertheless, novel words continue to be a valuable tool in the armoury of child language researchers.

## Negative feedback

Another form of corrective input can also be identified, which I term *negative feedback* (to distinguish it from *negative evidence*).

Alex (aged 4;1–4;9)

Alex: *Knights have **horse**, they do.*

Matthew: *They what?*

Alex: *He **slided** down the door.*

Matthew: *He what?*

Alex: ***Ouch!** It **hurted**.*

Matthew: *Eh?*

Negative feedback is provided when adults seek to clarify what the child has said, following a grammatical error. My responses here can be classified in each case as an error-contingent clarification question (CQ). CQs feature as a significant part of conversation, accounting for

something like 5 per cent of all turns in adult–adult discourse (Purver, Ginzburg & Healey, 2001). We constantly need to check on each other’s meaning, but my suggestion is that, incidentally, they may help the child check on the syntactic form of their speech. That is, error-contingent clarification questions may function as a form of negative feedback. Children as young as 12 months old respond appropriately to clarification questions, by returning to their original utterance and either repeating or repairing it in some way (Golinkoff, 1986). There is some evidence also that children correct themselves, following the intervention of an error-contingent CQ. They switch from erroneous to correct forms for a wide range of grammatical errors, when supplied with negative feedback (Saxton, 2000; Saxton et al., 2005). If we think about how negative feedback works, then it is quickly apparent that it provides a weaker form of corrective information than negative evidence. This is because the adult provides no correct alternative to the child error. The *prompt hypothesis* predicts that negative feedback provides a cue for the child that, essentially, jogs their memory about language forms they have already learned. Overall, we see that parents provide at least two kinds of corrective signal, both negative evidence and negative feedback.

## Corrective input: Summary

The problem of explaining how children overcome their language errors must be addressed in all approaches to language acquisition. Corrective input provides the most straightforward solution to this problem. And the evidence is now quite compelling that parents not only correct grammatical errors, but that children respond accordingly. We know this from a recent meta-analysis conducted by researchers with an interest in therapeutic interventions for children with language delays (Cleave, Becker, Curran, Van Horne & Fey, 2015). In essence, meta-analyses provide a statistical method for throwing the data of numerous studies into a big metaphorical pot to determine, overall, the fundamental trends in the findings. This kind of analysis is especially useful for investigating controversial topics, where conflicting evidence arises over the years. Cleave et al. (2015) deduce that error-contingent recasts are indeed a valuable source of learning for the child. Even so, many researchers continue to adhere to the ‘no negative evidence’ assumption. For example, a devout non-nativist, Tomasello (2009: 82) remarks that ‘adults do not explicitly correct child utterances with any frequency’. But the basis for this assertion is limited to the behaviourist-inspired notion of Disapproval reported by Brown & Hanlon 40 years ago. When I published the first edition of this book, Tomasello was one of many non-nativists who espoused the view that negative evidence is either not available to the child or of little practical use. Since then, though, the ground has begun to shift. For example, Ambridge (2013: 510) explicitly accepts that negative evidence ‘likely plays an important role in children’s learning’. Ironically, one researcher who has long supported the idea of parental corrections is Chomsky:

certain signals [child sentences] might be accepted as properly formed sentences, while others are classed as nonsentences, as a result of correction of the learner’s attempts on the part of the linguistic community. (Chomsky, 1965: 31)

As with imitation, it is widely – but wrongly – assumed that Chomsky rejected the notion of corrective feedback (e.g., Brooks & Kempe, 2012). But before we get too enthusiastic, it is unlikely that corrective input is either necessary or sufficient to guarantee the successful acquisition of grammar. Other mechanisms are undoubtedly at work. The ‘no negative evidence’ assumption has created an abiding puzzle, and hence, an abiding prompt to theorizing. It has encouraged the exploration of multiple solutions to the same learning problem, some or all of which may be available to the child (cf., Golinkoff & Hirsh-Pasek, 2008). We shall consider some of these proposals in Chapters 7, 8 and 9. The more suggestions we have to consider, the more likely it is that we shall discover how the child succeeds in acquiring an adult sense of grammaticality.

## Universality of CDS

While linguistic input is clearly necessary for language learning, it is less obvious whether Child Directed Speech is necessary. It is conceivable that the many fine adjustments and simplifications typical of CDS are simply icing on the cake: a welcome addition, that may *facilitate* language development, but which are not in any way necessary. To test this idea, all we need to do is find a single child who has been deprived of this special input, but who has nevertheless acquired language normally. In fact, it is widely assumed that many children *are* so deprived. Pinker (1994: 40) asserts that ‘in many communities of the world, parents do not indulge their children in Motherese’. He further adds that ‘the belief that Motherese is essential to language development is part of the same mentality that sends yuppies to “learning centers” to buy little mittens with bull’s-eyes to help their babies find their hands sooner’ (ibid.: 40). In fact, Pinker is setting up a straw man here, since no-one, to my knowledge, has argued that CDS is *necessary*, rather than simply facilitative. More to the point, when we look at the empirical evidence, Pinker’s assertion is not supported. What evidence we possess indicates that children around the world *are* exposed to at least some of the characteristic features of Child Directed Speech.

A limited number of studies are continually cited in defence of the idea that CDS is not universally available (see Saxton, 2009). We will focus on the best known example, the African-American community of Trackton in South Carolina studied by Heath (1983). The Trackton adults studied by Heath were dumbfounded by the idea that parents should modify their speech when talking to infants:

Now just how crazy is dat? White folks uh hear dey kids say sump’n, dey say it back to ‘em, dey aks ‘em ‘gain ‘n’ ‘gain ‘bout things, like they ‘posed to be born knowin’. You think I kin tell Teegie all he gotta know? Ain’t no use me tellin’ him: learn dis, learn dat. What’s dis? What’s dat? He just gotta learn, gotta know. (Heath, 1983: 84)

Heath (ibid.: 7) is the first to acknowledge that she is not a psychologist. And this is important because what we have here is an informant who is not the main caregiver of the child and who is reporting on her *beliefs* about child rearing. What her actual practices are remain unclear. In fact, there is a marked contrast between what people *say* they do in talking to children and what

they *actually* do. Haggan (2002) conducted interviews with 82 Kuwaiti adults and discovered that 18 of them were adamant that they made no concessions when talking to children. Some even suggested that the use of ‘special ways’ to communicate would be detrimental to language development (ibid.: 22). Haggan then observed each of these ‘CDS sceptics’ interacting with a child aged 2–3 years. She found that every single one of these sceptics modified their speech in ways entirely typical of Child Directed Speech. These include the use of short, semantically simple sentences, concrete referents based on the child’s own interests and extensive repetitions. Had Haggan stopped her study at the interview stage, she would have been left with a fundamentally mistaken view of how Kuwaiti adults interact with their young children. In a similar vein, Birjandi & Nasrolahi (2012) report that, in the Iranian city of Babol, parents generally deny correcting their children’s errors. Nevertheless, a majority of parents do, in fact, supply negative evidence.

As it happens, there is a strong indication that the parents in Trackton do use elements of CDS in their talk with young children. For example, ‘when adults do not understand what point the young child is trying to make, they often repeat the last portion – or what is usually the predicate verb phrase – of the child’s statement’ (Heath, 1983: 93). This kind of interaction sounds remarkably like the recasts described above. More research of a less anthropological flavour, with a stronger psychological bite, would be welcome here. But it is apparent that key pieces of evidence from Heath’s study have been overlooked. Instead, much attention has been paid to Heath’s observation that ‘during the first six months or so, and sometimes throughout the entire first year, babies are not addressed directly by adults’ (ibid.: 77). This is a dramatic assertion. Why would parents not talk to their babies? It is suggested that ‘for an adult to choose a preverbal infant over an adult as a conversational partner would be considered an affront and a strange behavior as well’ (ibid.: 86; cf., Pye, 1986). Again, though, what we need is some hard evidence on what Trackton parents actually do, both in private and in public. What we do know for certain is that parents and others must, and indeed do, start talking to the child at some point. We also know that parents are not the only source of CDS. Children as young as 4;0 modify their speech when talking to toddlers (Shatz & Gelman, 1973; Weppelman, Bostow, Schiffer, Elbert-Perez & Newman, 2003). In Trackton, there is evidence that older children may supply specially modified input for their younger siblings and peers (Heath, 1983: 93).

Every possible feature of CDS does not appear in the speech of every parent throughout the world (Pye, 1986; Lieven, 1994). More likely, there is a ‘smorgasbord effect’. The speech of parents in different cultures will express different combinations of CDS features, ‘selected’ from the full menu. Cross-cultural research does reveal the widespread occurrence of one important CDS feature: the practice of repeating child speech back to them in one form or another. Repetitions, elicited repetitions and recasts have been recorded in the adult input in a wide range of languages. Thus, Mead (1930: 35) remarks of the Manus people of New Guinea that the adult’s ‘random affection for repetitiousness makes an excellent atmosphere in which the child acquires facility in speech’. In a Danish context, Jespersen (1922: 142) made a similar observation: ‘understanding of language is made easier by the habit that mothers and nurses have of repeating the same phrases with slight alterations’. In addition to Manus and Danish, speakers of many other languages provide recasts for their children, including French (Chouinard & Clark, 2003), K’iche’

Maya from Guatemala (Pye, 1986), Hebrew (Berman, 1985), Mandarin (Erbaugh, 1992), Persian (Birjandi & Nasrolahi, 2012), Japanese (Clancy, 1985), Korean (Clancy, 1989), Samoan (Ochs, 1982), and Warlpiri from Australia (Bavin, 1992). And, of course, we can also add Trackton in South Carolina to this list.

Generally speaking, the idea that CDS is confined to well-educated, white, middle-class mothers is without foundation. There has not been a great deal of research, and much of it is, in any case, anthropological in nature. It was not designed for the study of language acquisition. Moreover, this research has often been communicated to the child language research community in a partial, inaccurate manner. For example, the recasts found in the speech of Trackton parents are routinely overlooked. At the same time, errors have crept in that betray a lack of direct engagement with the literature. For example, 'Trackton' sometimes appears as 'Tracton' (Hamilton, 1999: 430), while the informant quoted above has been wrongly described as 'Aunt Mae' (Pinker, 1994: 40). She is, in fact, 'Annie Mae'. Moreover, she is not the child's aunt, but his grandmother. Repeat warning: read the original sources for yourself. All in all, the assumption that CDS is absent in some cultures lacks support. In fact, the available evidence points in the opposite direction with at least some standard features of CDS being reported in all cases so far. Undoubtedly, though, we require better evidence on this issue. Future research should tell us much more about the linguistic environments of children throughout the world.

## Input and interaction in language acquisition

The child's linguistic environment was a major focus of interest during the 1970s, but since then, interest has declined. We can identify at least three reasons for this decline. First, many of the basic facts about Child Directed Speech were established during this period. And although subsequent studies have refined these findings, they have not substantially altered our view about the nature of CDS. Second, the significance of a special register, directed at young children, was undermined by the assumption that CDS is largely confined to a privileged minority of Western mothers. This assumption still prevails, but we have challenged it here, in our review of cross-cultural research. Third, the locus of interest, in both nativist and non-nativist theories, has shifted firmly to the child. The central aim is to describe and explain the learning mechanisms and knowledge that the child brings to the task of language acquisition. This shift towards the child, away from the environment, is entirely justified. We want to discover how the child acquires language, after all. But the environment still deserves our attention.

As we shall discover in Chapter 9, present theorizing reduces the role of the input to a matter of frequency. The number of times that a child hears a particular linguistic form is held to be the critical environmental factor that contributes to language development. Of course, frequency *is* important (Cameron-Faulkner, 2012; Ambridge, Kidd, Rowland & Theakston, 2015). Children's experience of language differs quite widely with regard to input frequency, with a direct impact on language development. But frequency is not the only factor of interest. Interaction is also critically important, both verbal and non-verbal. In this regard, imitation – as a form of interaction – stands out as a fundamental human behaviour that is implicated in

language development. The study of corrective input can be seen as one branch of the broader topic of imitation studies. Language is acquired in the context of interaction with other people and input alone – simple exposure to linguistic forms – will not suffice.

Even if we accept that both input and interaction are essential ingredients for language development, that does not commit us to the need for a special register. In principal, we could speak to a baby or toddler in precisely the same way that we speak to an adult. The assumption that CDS is not universally available leads directly to this conclusion. And yet, my guess is that very few researchers, if any, would advocate withholding CDS and replacing it with Adult Directed Speech. In any event, our review of cross-cultural research revealed that assumptions about the ‘non-universality’ of CDS are unfounded. At the same time, much more cross-cultural research is needed, designed by psychologists with a direct interest in the environment of the language learning child. Personal guess Number 2 is that parents throughout the world will adopt at least some of the characteristic features of CDS at least some of the time. This belief is based on the assertion that Child Directed Speech is actually inevitable (Saxton, 2009).

Arguably, the only way to engage a young child in conversation is to follow their lead and this includes the choice of conversation topic. Try talking to a two-year-old about your council’s recycling policy and see how far you get. Now try talking about the book that the child is holding in their hands. Notice the difference? The young child is constrained, both linguistically and cognitively, and these constraints compel adults (and older children) to adapt to these limitations. Otherwise, communication will not succeed. An adult who fails to engage the child will only succeed if their next attempt dovetails more closely with the child’s limited capacity and particular motivation to communicate. It is not surprising, therefore, that parents around the world spend so much time recasting child speech, effectively acting like a mirror, reflecting back the child’s own speech with a range of modifications. By following the child’s lead in this way, the adult can more easily maintain a conversation that is geared to the level and interests of the child. Observe that the motivation of the adult, conscious or otherwise, is to *communicate* with the child, not teach language. It just so happens that a special form of facilitative input and interaction – Child Directed Speech – falls out naturally from communication with a young child. It is in this sense that CDS might be inevitable. Given that both input and interaction are necessary for language development, it remains possible that at least some aspects of the special register, Child Directed Speech, are essential to guarantee successful language acquisition.

## IN A NUTSHELL

---

- Adults and older children use a special register, known as Child Directed Speech (CDS), when talking to young children. They simplify and clarify their speech in numerous ways, at every level of language, including phonology, vocabulary, morphology and syntax.
- CDS is a dynamic register, with adult speech being tuned, to some extent, to the language level of the child as it changes over time.

- The amount of linguistic input available to children varies quite widely. Children of 'high-talking' parents tend to be relatively advanced in terms of vocabulary and grammar development.
- The child's linguistic environment comprises both input (language forms) and interaction (the way those forms are used in conversation).
- Children cannot acquire language from watching TV, a situation in which they are exposed to input in the absence of interaction. Interaction is therefore essential for language acquisition.
- Imitation, both verbal and non-verbal, is a fundamental aspect of human interaction. Infants who are especially responsive to imitation develop relatively advanced vocabularies.
- Parents frequently imitate their children, repeating back child utterances with modifications (recasts).
- Some adult recasts can function as a form of corrective input for grammatical errors (negative evidence). They present a direct contrast between a child error and a grammatical alternative offered by the adult.
- It is widely assumed that CDS is not universally available, but cross-cultural research does not support that assumption.
- Child Directed Speech may be an inevitable consequence of adapting to the communicative needs of a conversational partner who is both cognitively and linguistically immature.

## FURTHER READING

---

Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26(1), 55–88.

This article provides a thorough review of the social factors that affect the amount and quality of talk to young children. It goes beyond the factor of socioeconomic status considered here to include numerous other factors, including ethnicity, multilingualism, and childcare experience.

Matthews, D. (Ed.) (2014). *Pragmatic development in first language acquisition*. Amsterdam: John Benjamins.

Although topics in interaction are touched on in this chapter, we do not explore in any depth how the child comes to use language as a tool for communication. This recent collection does an excellent job of filling the gap.



## WEBSITES

---

- **Effects of TV viewing on child development:**

Google: *How TV affects your child – KidsHealth* for the following site: <http://kidshealth.org/en/parents/tv-affects-child.html>. If you still need convincing about the Evils of Television, this site takes you one step beyond language acquisition to summarize the effects of TV viewing on other aspects of child development. A note of warning: this site is not intended for a scientific audience, so be prepared to follow up any points of interest by checking with the original research literature.

Still want more? For links to online resources relevant to this chapter and a quiz to test your understanding, visit the companion website at <https://study.sagepub.com/saxton2e>