

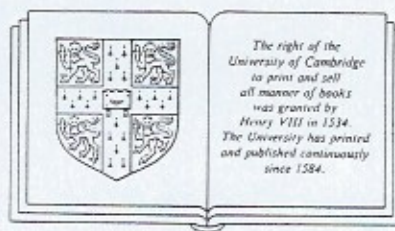
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6 Abnormal language acquisition and the modularity of language

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6.0. Introduction

My daughter, Rebecca, was not an early talker. Over a long period of time she produced many delightful monologues of gibberish which, by the time she was close to two years of age, had evolved into soliloquies of gibberish combined with English words. 'When, oh when, will she start to acquire the *grammar*?' I wondered (sometimes aloud). 'Only a *linguist* would care about her *grammar*,' family and friends would say with some disdain. They were probably right. Many, if not most, linguists are concerned with characterizing and accounting for the grammar, as opposed to other aspects of language. Linguists are frequently called to task for having this narrow focus, rather than considering and studying language in its broader context.

Some theories of language acquisition reflect similar biases against the validity of focussing exclusively on grammar. The concurrent development of motor, social, cognitive, and linguistic abilities in the normal child is a fact which no doubt has influenced several theories of language development (e.g. social interaction theories: Bruner 1977; Bruner & Ninio 1978; Ratner & Bruner 1978; cognitive theories: Macnamara 1972, 1977; Lock 1978; Bates *et al.* 1979; Piaget 1980) to stress the interconnections between acquisition of the grammar and other areas of development. Such theories entail that nonspecific learning mechanisms underlie the changes that occur with increasing age across domains of knowledge. A linguistic theory of language acquisition, in contrast, has as its goal and single focus, an adequate account of the acquisition of steady state *grammars*.

In this chapter I will present data which argue that to achieve the objective of accounting for the acquisition of grammar linguists are correct in typically confining their area of inquiry to that of grammar, not just for reasons having to do with philosophy of science and research productivity, but because there is increasing evidence from atypical instances of language acquisition that grammar acquisition involves task-specific mechanisms and faculty-specific principles. The evidence comes from cases showing dissociations between grammar acquisition and the development of other aspects of linguistic

knowledge. This dissociation in some cases reveals a selective impairment of grammar acquisition, in other instances a selective preservation of this faculty. The data support Chomsky's (1980) distinction between a computational linguistic component (essentially the grammar) and other faculties of mind, including other aspects of language; but they further subdivide these 'other' aspects of language into themselves dissociable components of communicative and conceptual linguistic knowledge.

6.1. Selectively impaired grammar acquisition

There is a variety of populations who give evidence of a selective impairment in grammar acquisition. They fall generally into three categories: (1) cases of acquisition beyond the critical period or beyond the most active years of first language acquisition in normal development; (2) cases where there is clear-cut damage to brain regions normally specialized for language; and (3) cases with less clear-cut etiologies.

6.1.1. Grammar acquisition beyond the typical age

Consideration of data bearing on a proposed critical period for language acquisition (Lenneberg 1967) suggests that it is acquisition of the *grammar* which is most sensitive to age at acquisition, not the development of linguistic skills *in toto* (Curtiss 1977, 1981a, 1985, in press). Two cases which support this conclusion are Genie and Chelsea.

Genie

Genie is, to date, the most extensively studied and widely reported case of acquisition beyond the normal acquisition years (Curtiss *et al.* 1974; Fromkin *et al.* 1974; Curtiss, 1977, 1979). Genie, found in adolescence having suffered unprecedented social isolation and experiential deprivation, faced the task of first language acquisition at the age of 13½. The linguistic-cognitive profile that emerged during the eight-plus years Genie was studied, was one of good lexical and propositional semantic abilities alongside normal or relatively normal nonlinguistic cognitive function, contrasted with marked impairments in (1) psychosocial function, including the use of language for social purposes, and (2) acquisition of the grammar. Even after more than eight years of linguistic exposure and attempted acquisition, Genie's utterances remained largely agrammatic – they contained little and inconsistent use of inflectional morphology and other nonlexical grammatical markers, and were devoid of syntactic devices marking clausal relations or noncanonical sentence form (as in questions or topicalizations). Insensitivity to many of the

opposing semantic specificity on the same noun, and the possible occurrence of a determiner (Det) specifier on the modifier (Mod) *small*; the switch in order from Mod-N to N-Mod in (13); the separation of constituents of PP (and NP) in (14); and the inconsistent use of determiners in (12), (14), (17), and (18). Note also what is either the occurrence of Det with V in (15) and (20) or the unconstrained variation of Det-N order (compare (12), (15), (17), and (20)); the ungrammatical use of Det with proper names and pronouns in (22) and (24); the chaotic concatenation of NPs and VPs in (16) and (21); the unconstrained SVO order in (18)–(21); and the unprincipled occurrence of *be*, other AUX elements, and agreement phenomena in (16), (21), (22), and (23).

Chelsea's comprehension performance reflects a reliance on knowledge of vocabulary and situational pragmatics. Her performance on the Token Test (2/25/82) showed good comprehension of parts I–IV, which use a simple and unchanging syntactic structure but impose an increasing conceptual and memory load, but little comprehension of part V, which contains a variety of syntactic and semantic structures. Likewise, her performance on the Assessment of Children's Language Comprehension (ACLC) on 5/18/84, a test where most correct answers can be achieved without knowledge of the grammar, was quite good (e.g. 80% correct on part D), whereas in 3/84 Chelsea's performance on several subtests of the CYCLE (Curtiss Yamada Comprehensive Language Evaluation), specifically testing comprehension of morphology and syntax, revealed little comprehension of English grammar.

In contrast to her impairments in grammar acquisition, her acquisition of vocabulary has been rapid and steady. The organization of her lexicon along conceptual/semantic lines also appears to be normal, as exemplified by her above-12th-grade-level performance on a subtest of the CELF (Clinical Evaluation of Language Functions), which involves naming as many items as possible of a given category (foods and animals) within a one-minute time limit. She has also learned, and makes effective use of, automatic phrases and social formulas (e.g. *Be quiet, How are you?, What?*) and other discourse conventions (e.g. *OK, Well*), giving her conversations the trappings of normal linguistic interaction. Recall that Genie never learned any of the culturally determined social conventions of discourse, despite overt attempts to teach some to her. Thus, while in both Chelsea and Genie's cases the integrity of lexical semantic acquisition was dissociated from grammar acquisition, we see from the differences in the two cases the additional separability of social and communicative linguistic abilities from each of these other areas.

Other cases

The selective vulnerability of grammar to age at acquisition is also seen in a variety of studies investigating acquisition of American Sign Language (ASL). Young (1981) and McKinney (1983) report on several cases of first language acquisition in hearing-impaired adults. These cases show the same profile of impaired grammar acquisition in the context of good vocabulary acquisition, coding of semantic relations, and discourse skills. What is equally compelling, however, are reports of deficits in grammar acquisition in individuals who undertook first language acquisition *in childhood*, but after the typically most active years of language acquisition. Woodward (1973) notes deficits in the mastery of two morphological processes in ASL: negative incorporation (on verbs) and reduplication, in subjects who learned ASL after the age of 6 years. Newport (1984) found that not only did all the 'late' learners in her study (those learning sign between ages 12 and 21) show deficient comprehension and production of the complex grammatical properties of ASL verbs of motion (see Supalla *in press*), but even those who had started learning ASL as young as 4 to 6 years showed deficits relative to those exposed to ASL from birth. A growing number of experiments on the processing of ASL confirm these findings. Mayberry (1979), Fischer & Mayberry (1982), Tartter & Fischer (1982), and Mayberry, Fischer & Hatfield (1983) all report significant differences in efficiency and accuracy of processing structural linguistic information between those who had learned ASL early in life and those who had been exposed to ASL only later.

There is, then, growing evidence of selective impairments in grammar acquisition when acquisition takes place beyond early childhood years, in support of the view that grammar rests on distinct principles of organization, and that grammar acquisition involves faculty-specific mechanisms. These mechanisms appear to be maturationally constrained along a timetable which is different from, independent of, and more restricted than those governing the social-communicative and referential components of linguistic development.

6.1.2. Cases of early neurological damage to the 'language zones'

The cases in this category reveal the same basic pattern, wherein the grammar (phonology, morphology, syntax) is compromised relative to linguistic-pragmatic and lexical development.

Cases of left hemispherectomy (or hemidecortication) in childhood after at least early stages of language acquisition, are reported to result in severe grammatical deficits – limited comprehension and production of many morphological and syntactic structures, largely agrammatic speech, and an

Table 1

Child	Pragmatic appropriateness (%) ^e	Speech act range (%) ^e	Type/token nouns	Type/token verbs	Lexical misuse (%) ^b	Semantic ill-formedness (%) ^c	Ratio of score to no. of utterances ^d	Syntactic ill-formedness (%) ^f
R.R.	90	78.6	64	63	0.0	3.45	6.2	41
C.C.	84	71.4	69	62	3.6	3.60	10.0	45
A.P.	96	79.0	55	49	3.1	6.40	6.7	42
normals ^g	69 ^h	86.5	67	52	4.0 ^h	8.46 ^h	16.25	18

Notes: ^a % of 50 contiguous child-utterances in a conversational dyad.

^b % misuse out of a total number nouns, verbs, modifiers, quantifiers, pronouns, conjunctions, and prepositions.

^c % of omitted or inappropriate semantic roles or arguments of total number expressed in 50 non-imitated utterances.

^d Quantitative score reflecting general degree of morphological elaboration, syntactic complexity, and syntactic well-formedness in 50 non-imitated, nonritualistic or automatic utterances.

^e % of 50 non-imitated, nonritualistic or automatic utterances.

^f 10 IQ-, SES-, and 'language-age'-matched normals (ranging in age from 24 to 34 years).

^g Scores reflect the children's young age (2-3 years).

Developmental dyslexics

There is now growing evidence that developmental dyslexia is associated with specific neurological anomalies of the left hemisphere, most specifically, anomalies of neuronal migration (Drake 1968; Galaburda & Kemper 1979; Geschwind & Galaburda 1985). What is of interest here is that in developmental dyslexia, in addition to reading, lexical and grammar acquisition appear to be impaired. Vocabulary size and lexical processes such as retrieval and rapid naming are reported to be significantly affected (Denckla & Rudel 1976a,b; Jansky & de Hirsch 1976; Wolf 1986). Deficiencies in phonological representations and difficulties with inflectional morphology and syntax have also been reported (see Vellutino 1979 for a review). Recent linguistic research on adult dyslexics has revealed specific anomalies in pronoun- and anaphor-antecedent binding relations (in government and control structures) and deficient processing of *determiners* as opposed to other syntactic categories in this population (Kean 1984). There are no reports of impoverished pragmatic abilities in dyslexics, however. We see once again, then, the association of impaired grammar acquisition with impairments of the left cerebral hemisphere, the separability of grammar learning mechanisms from those underlying the acquisition of pragmatic competence, and the separability also of pragmatic development from lexical development.

6.2. Selectively intact grammar acquisition

Other cases of abnormal or atypical acquisition show a reverse profile, wherein grammar acquisition appears intact in the context of difficulties in other areas of linguistic development.

6.2.1. Intact grammar acquisition in mentally retarded children

One kind of case involves intact grammar learning despite impairments in other components of linguistic development and despite significant and pervasive retardation. Two of these cases have been presented at greater length elsewhere (Curtiss & Yamada 1981; Curtiss 1982, in press; Yamada 1983).

Antony

Antony was studied over a period when he was 6½ to 7 years of age (see Curtiss & Yamada 1981 and Curtiss 1982 for details). Estimates of his IQ range from 50 to 56, and professional reports of his developmental progress indicate pervasive delays in most areas: motor, social, and cognitive. Against this

morphology in (57), the rich AUX structures, the consistent adherence to subcategorization constraints and θ -structure, and the embedding of sentences as *wh*- and participial complements in (52) and (60) and as relatives in (55) and (58).

Rick's propositional semantic problems can be seen, even out of context, in examples (54), (58), and (61). Additional examples showing his lexical and propositional deficiencies can be seen in examples (62)–(65):

(62) R: (I) Played checkers [R doesn't know how.]

S: How do you play?

R: You just, you just put one pile in.

S: One pile of what?

R: One pile of cards.

S: And then what?

R: And then you put another tape. [R is looking at a tape recorder]

(63) S: . . . tell us what she looks like.

R: She looks like she has blonde hair.

S: What color is blonde?

R: Black.

(64) S: How does she wear her hair?

R: She wears it up in a pony tail.

S: How long is it?

R: It's big around her pony tail.

S: When she takes her pony tail out, how long is it?

R: It's wh, shorter.

S: Shorter than what?

R: Like whiskers.

S: Is it as short as yours?

R: Yes.

S: How can she get it in a pony tail?

R: She can get a pony tail from someone else.

(65) R: I liked the airplane.

D: What airplane's that?

R: The one that looks like a rocket.

D: Which one's that? Where'd you see that?

R: On television.

D: What show was it on?

R: —

D: Do you know?

R: —

D: What was the rocket doing?

R: Falling.

D: Falling? Falling from where?

R: Falling from the floor.

Rick has highly developed interactive pragmatic skills, especially with respect to the use of social formulas and other interactive conversational devices, as illustrated in (66)–(69) (note italicized phrases):

(66) D: Hi, Rick.

R: Hi.

D: Good to see you.

R: *Good to see you, too.*

(67) D: Wanna turn the page?

R: *Sure, Dan, I'll turn.*

(68) S: Is my name Marsha?

R: No.

S: Is my name Susie?

R: No.

S: What is it?

R: It's Daniel. *Sweetheart, you're for me.*

(69) (After listening to a tape of music)

M: How'd you like it?

R: *I think it looks all right.*

Note that Rick sometimes uses a routinized phrase when semantically inappropriate or perhaps even pragmatically inappropriate (69).

In summary, in Rick, as in Antony, we see a profile of intact grammar acquisition relative to lexical and nonlinguistic development. However, in contrast to Antony, Rick has considerable pragmatic ability, demonstrating, therefore, the potential independence of grammatical, referential, and socio-communicative development from each other.

Marta

A third case is Marta, who was studied between the ages of 16 and 18 (see Yamada 1981, 1983; Curtiss in press, for details). Estimates of Marta's IQ range from 41 to 48. All developmental milestones, including linguistic

both markedly deficient in Antony, Rick, and Marta's case. Pragmatic ability appears tied to both social and cognitive function, with topic-related abilities related to cognitive maturity, but rules and conventions of discourse more related to psychosocial integrity. Thus, on the one hand, Genie had relatively good topic-related skills, whereas Antony, Rick, and Marta had notable deficiencies in this area. On the other hand, Genie had sorely deficient knowledge of the social conventions of discourse, whereas Chelsea, Antony, Rick, and Marta appeared fairly normal in this area. Each of these areas, then, appears to constitute a distinct component of linguistic knowledge: (1) a *referential/propositional* component, which includes knowledge of semantic feature specifications and knowledge of propositional form and relations, and which appears to intersect with conceptual knowledge, the system of object-reference, and logical structure; (2) a *social-communicative* component, which includes the rules governing the use of language for communicative purposes, and which appears to intersect with the rule system governing nonlinguistic communication and social interaction; and (3) a *grammatical* component, which includes the rules of phonology, morphology, syntax, and logical form, and is an autonomous system of knowledge.

6.4. Discussion

A basic tenet of neuropsychology is the 'transparency' assumption: the assumption that one can extrapolate from the abnormal case to the normal case. On this assumption, instances of abnormal language acquisition can help to shed light on the mechanisms and principles of normal language acquisition. The cases presented above provide evidence that grammar acquisition can be dissociated from other aspects of language learning, from nonlinguistic cognitive development, and from other aspects of communicative ability, and is, therefore, an autonomous knowledge system. On the transparency assumption, this should hold true in normal language acquisition as well. While the data may be more clear-cut in abnormal cases, there are data from acquisition in normals confirming these findings.

First, in cases where the child and her language learning mechanisms are normal, but the language learning circumstances are not (as is the case in blind children, for example), one finds relatively intact grammar acquisition alongside more problematic pragmatic development (Urwin 1978; Anderson & Kekelis 1982 and personal communication; Landau & Gleitman 1985) and, some researchers argue, lexical semantic development as well (Dunlea 1982; Anderson, Dunlea, & Kekelis 1984).

Second, in cases such as acquisition of American Sign Language (ASL) as a native language, where the language learning circumstances afford an opportunity to directly examine the relationship between communicative

development and acquisition of formal linguistic structures, one finds strong evidence that the two are maturationally and cognitively independent. Both Petitto (1983) and Jackson (1984) have found that the acquisition and use of isomorphically identical movements which in one instance are communicative gestures (e.g. deictic pointing, a head shake for 'no'), and in another are linguistic forms (e.g. pronouns, 'negative marker'), are clearly distinct. Despite the iconicity of the ASL signs in question and the formational identity of the gestures and signs, Petitto and Jackson report that the signs were learned significantly later and were associated with errors which can only be explained by an analysis into their formal linguistic properties.

Third, in normal acquisition under normal circumstances there also can be a notable asynchrony between semantic and morphosyntactic development. Reilly (1982) presents clear evidence of such asynchrony in the acquisition of conditionals. Lord (1979) presents similar findings in the acquisition of causative structures.

Not only do I accept the transparency hypothesis, I find evidence for it in my own home. While my normally developing daughter, Rebecca, had the audacity not to be an early talker, she had the good sense to provide me with data confirming the independence of grammar acquisition. Sentences like (93)–(98) were not uncommon in Rebecca's speech (distressing her father a little, but pleasing her mother, quite a bit):

- (93) When I was a dog, on the third day, I was a baby the third day,
and I had blue pajamas [2:8]
- (94) That's a big whole baby in the south [2:8]
- (95) Be quiet and you'll never be loud enough if I be quiet [2:8]
- (96) I took it off and I put it in my ponytail [re. a rubber band that *had*
been in her hair]
- (97) Now it's not gone and it's still gone [2:8]
- (98) She *was*, in a couple of hours [2:10]

Thus, even my 2-year-old daughter believes in the necessity of a theory of language acquisition that allows for the independent growth of syntax and semantics. Why, just the other day, during a game of Zoo Lotto, she argued for a modular theory of mind, wherein grammar (and its acquisition) is based on domain-specific cognitive principles. In her view the principles of UG (whatever their final version) are specific to the language faculty and are not a set of principles constraining cognitive systems more generally. She thinks the data I've presented in this chapter support this view. It's good to know I'm doing something right.

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7 Grammatical aspects of speech errors

Victoria A. Fromkin

'A final word about the theory of errors. Here it is that the causes are complex and multiple . . .'

Henri Poincaré 1854-1912 (Reprinted in Newman 1956)

'Give me fruitful error any time, full of seeds, bursting with its own corrections.'

Vilfredo Pareto 1848-1923 (Quoted in Mackay 1981)

7.1. Historical background

Linguists have been collecting and analyzing slips of the tongue at least as far back as the eighth century CE when the Arab linguist Al-Ki-sa'i wrote his book *Errors of the populace* (Anwar 1979). As Anwar (1979, 1981) points out, more than a hundred books on speech errors written by Arab grammarians have been published since that seminal work, many during the important medieval period of Arabic linguistic studies.¹

Although a number of these medieval studies have prescriptivist intent, using the term 'error' primarily in reference to wrong usage by non-native speakers of Arabic or speakers of nonstandard dialects, the grammarians also recorded, analyzed and classified a wide variety of slips of the tongue, i.e. 'unintentional linguistic innovation(s)' (Sturtevant 1947) or 'involuntary deviation(s) in performance from the speaker's current phonological, grammatical or lexical intention(s)' (Boomer & Laver 1968), as is being done by linguists today. Like Paul (1886, 1919), Sturtevant (1917), Jespersen (1922) and Meringer (1908), many of the medieval Arab studies were motivated by an interest in speech errors as a possible cause of historical change; others attempted to provide phonetic and phonological explanations in terms of assimilatory factors and/or the interface between phonological and morphological processes. Anticipations, deletions, and insertions of linguistic units were noted in studies conducted over eleven centuries ago.

Cutler's (1982a) bibliography on speech errors lists ten of these early studies including a ninth-century manuscript of As-Sikkit and a tenth-century work of Al-Jawzi. The bibliography contains references to 315 books and

¹ Anwar is justifiably critical of Fromkin's (1971, 1973) and Cutler & Fay's (1978) reference to Rudolf Meringer (Meringer & Mayer 1895; Meringer 1905) as 'the father of the linguistic interest in speech errors' (Fromkin 1971). It would unfortunately not be the first time that Western 'scholarship' revealed its ethnocentricity.