Chapter 7

Creation through Contact: Sign Language Emergence and Sign Language Change in Nicaragua	Judy Kegl, Ann Senghas, and Marie Coppola

Particularly in the case of language, it is natural to expect a close relation between innate properties of the mind and features of linguistic structure; for language, after all, has no existence apart from its mental representation. Whatever properties it has must be those that are given to it by the innate mental processes of the organism that has invented it and that invents it anew with each succeeding generation, along with whatever properties are associated with the conditions on its use.

—Chomsky, *Language and Mind*

7.1 Introduction

We report here one of the first documented cases of the birth of a natural human language. Our observations and findings focus upon the signing of approximately 500 Deaf[1] children and young adults in the urban areas of Managua, Nicaragua's capital and largest city. Our studies also include data from several areas outside of Managua. In conjunction with the Ministry of Education (MED) and a national social service organization (INSSBI; Instituto Nicaragüense de Seguridad y Bienestar—Nicaraguan Institute for Social Security and Welfare), Kegl is engaged in a comprehensive study of the state of signed language(s) and the deaf population throughout Nicaragua, focusing on individual and dialectal differences as a factor of age, geographical location, and degree of contact with the Deaf community. This newly emergent language in its fully evolved form has existed for barely more than a decade. For the majority of its users, it is referred to simply as "signing." SIGNING is distinct from homesigns, referred to by both Deaf and hearing Nicaraguans as *mimicas/* MIMICAS[2] (mime or gesture).

Mimicas is not recognized as part of Nicaraguan Sign Language. This communication form is used by deaf people in isolation or those who are still linguistically isolated because they made contact with the Deaf community[3] well after the passage of what seems to be their critical period for language acquisition (see Lenneberg 1967). In fact, today, older signers whose repertoire is limited to homesigns are referred to as NO-SABES 'know nothings', referring primarily to their inability to acquire Nicaraguan Sign Language. These homesigners are welcomed into the Deaf community by virtue of being deaf but are not fully enculturated into it. Each isolate's homesign system is unique, idiosyncratic, variable even within the individual,

and lacking most characteristics, particularly syntactic, of what we would recognize as a full-fledged human language.

We will argue here that the complex signed language we see in Nicaragua today evolved from the jumble of idiosyncratic homesign/gestural systems in use by students who entered the schools in the late 1970s and early 1980s. As a precursor to the discussion, we will summarize the line of argumentation and major issues to be raised.

7.1.1 Evidence for Language Genesis

First, we will establish that no pre-existing signed language was available in Nicaragua, that deaf individuals were virtually isolated from one another, and that there were (almost) no cases of deaf children of deaf signing parents. Second, we will show that the first large-scale contact between deaf individuals occurred with the establishment of public schools as part of the postrevolutionary Literacy Campaign in 1980. Third, we will document from the mid 1980s a changing profile of both the communication and community of d/Deaf individuals in Nicaragua, leading to the current situation in which the younger the signers, the more fluent and complex their signing appears to be. Three communication forms currently characterize points along a continuum of sign fluency and complexity: (a) idiosyncratic gestural systems (homesigns) used by isolated deaf individuals or individuals exposed to signed language past a certain age range; (b) a highly variable and ever-changing form of communication that developed from the point when these homesigners came together in the schools and began to share their homesigns with each other, quickly leading to more and more shared signs and grammatical devices; and (c) a coexisting, but distinct, fully articulated signed language form that is in use only by individuals who entered the schools at ages well below the end of what could count as their critical period for language acquisition. We argue for a distinct discontinuity between (b) and (c) that reflects a radical restructuring of linguistic input that occurs via the process of first-language acquisition, where less than optimal input is supplemented by innate language capacities.

7.1.2 Language Genesis from a Creole Perspective

We will argue that the signed language mentioned in (c) above has emerged since 1980 and has evolved via a process akin to creolization, where: (a) Spanish, the only potential superstrate, had little early influence on signing[4] because it was relatively inaccessible to deaf individuals except via lipreading, although typical Nicaraguan gestures were available; (b) idiosyncratic gesture systems (homesigns) used by individual deaf children served as the substrates; (c) the highly variable, ever-changing communication form that developed after homesigners came into regular contact constitutes a peer-group pidgin or jargon between the homesign substrates; (d) an additional, more limited communication form, an asymmetric pidgin—evolved to meet the communication needs between Deaf and hearing individuals; (e) a signed creole abruptly came into being when the symmetric pidgin/jargon in (c) became the linguistic input to very young children and, via the normal process of language acquisition, they supplemented this variable input with their own innate language

expectations, yielding a brand-new language; and finally (f) the newly emerged creole quickly took its place as the target sign language for other young acquirers and pidgin/jargon signers alike. Motivating the language forms proposed and the timeline of events is a central focus of this paper.

7.1.3 Issues Raised by the Nicaraguan "Creolization" Case

The conditions under which a new signed language has emerged in Nicaragua are arguably unique and may well require a novel and distinct model of language emergence. However, certain scientific benefits are to be gained by also considering this case in the context of previously established models of language emergence—in particular, models of creolization and even more specifically those of abrupt creolization (e.g., Thomason and Kaufman 1988; Bickerton 1991). Considering the signed-language emergence in Nicaragua as a possible case of creolization highlights a number of issues requiring reexamination. Although we make no pretense of being able to resolve these issues, we confront several areas of controversy including (a) the extent to which strict conformity to a plantation model[5] is a prerequisite to pidginization; (b) the role played by superstrate and substrate languages in both pidginization and creolization; (c) the possibility that, even in the plantation model, an asymmetric pidgin between the superstrate and substrates and a symmetric pidgin between substrate languages could plausibly have coexisted; (d) the degree to which first-language acquisition is involved in or can be considered parallel to creolization; (e) whether abrupt creolization can circumvent the need for an intervening pidgin; (f) whether grammatical features of creoles are universal or modality dependent; and (g) whether serial verb constructions are strictly an African substrate contribution to creoles or are an expected consequence of creolization.

7.2 A Quick Glance at the Coexisting Communication Forms in Nicaragua

7.2.1 Terminology

In this chapter we use three different Spanish terms to refer to "language": *lengua*, *lenguaje*, and *idioma*. Nicaraguan Spanish makes a distinction between *lenguaje*, which can be any kind of a communication system, and *idioma*, which is reserved for formal, national languages. Informally defined, an *idioma* is a language with an army or navy. The word *lengua* can refer to either a *lenguaje* or an *idioma*. There are no signs yet that distinguish between the early signing that arose after homesigners came together in large groups and the very distinct signing form that arose when that early signing became a full-fledged language. For research purposes we distinguish these two language forms with the labels Lenguaje de Señas Nicaragüense (LSN, which we argue to be a peer-group pidgin or jargon between signers) and Idioma de Señas Nicaragüense (ISN, the full-blown signed language).

In addition to home signs, LSN, and ISN, a fourth communication form, El Pidgin de Señas Nicaragüense (PSN, a pidgin used between hearing individuals and deaf signers) has been identified and also labeled for research purposes only. When using this form, signers view themselves as speaking Spanish, and Spanish speakers view

themselves as signing or using Mimicas. Their interlocutors hold a contrary view—
namely, that deaf PSN signers are signing and that hearing PSN signers are speaking
Spanish. The term *pidgin* is used in this label because, although we argue it plays only
a minor role in the initial language emergence process, this communication form
most closely parallels the asymmetric superstrate-substrate pidgin classically identi-
fied in the plantation model of creolization. In this case, Spanish serves as the super-
strate, and the various homesign and signing varieties in use compose the substrates.
It should be noted that access to Spanish is severely attenuated by lack of access to
the auditory modality that is further exacerbated by a lack of access to educational
resources. Students in the schools were initially unaided and profoundly deaf. Even
today, individuals with enough residual hearing to allow speech are considered
"hearing" and are not sent to Deaf schools. Production of some speech was taught in
the schools. In 1987, students had a weekly speech class, where they were drilled on
various lexical items while wearing headphones that were linked together in a loop.
Lipreading was not systematically taught and is not commonly used by deaf Nicar-
aguans. In contrast with languages like American Sign Language, where in many
dialects partial mouthing of English glosses associated with some signs frequently
occurs, this phenomenon is not observed in Nicaraguan Sign Language. Only PSN
involves some mouthing of uninflected Spanish words.

A community-established Spanish name for this language was only recently estab-
lished with the publication of the Nicaraguan Sign Language dictionary (López
Gómez, et al. 1997). The language entity labeled by the new Spanish name, Idioma
de Señas de Nicaragua collapses LSN and ISN but excludes Mimicas.[6]

7.2.2 Observable Differences
Even for a nonsigner, differences between mimicas, LSN, and ISN are detectable.
These communication forms distinguish themselves on the basis of size of the signing
space, amount of symmetry in the use of the hands, degree of involvement of the
whole body in signs, as well as the nature of the use of face and space in signaling
grammatical information.

7.2.2.1 Mimicas In Spanish, *mimicas* means "mimetic gesture." It is the gestural
repertoire of an individual. In some cases, these gestures are idiosyncratic to the in-
dividual and must be learned by the receiver via contextual cues. In other cases, the
gestures or emblems are shared by the wider cultural group within which the indi-
vidual exists (Ekman and Friesen 1969). Some gestures are so transparent that their
referents are easily identified. And, finally, some gestures (e.g., affective facial expres-
sions) are universal (Ekman 1982).

Mimicas is distinct from the typical Nicaraguan gesticulation that accompanies
speech. Singleton, Goldin-Meadow, and McNeill (1995) nicely demonstrated the
disjunction between "gesticulation" (gestures accompanying speech) and "nonverbal
gesture" (gestures functioning on their own) by setting up an experiment where 15
college students with no sign language and no formal gestural experience viewed 40
videotaped vignettes depicting toy people and objects moving in various paths and

manners of motion. These vignettes were a subset of the 80 stimuli used in the Verbs of Motion (VMP) Test from the Test Battery for American Sign Language morphology and syntax (Supalla et al. 1990). Subjects were asked to first view each vignette and then describe what happened, using speech. All unprompted gesticulations were analyzed. The tape was then rewound and subjects described each vignette using gestures only. When subjects had to rely soley upon gesture, their gesture became systematized in ways that reflect more language-like organization including: an increase in reference to objects in the vignette; redundant marking of these objects (combining lexicalization of an object and action gestures that incorporate some of the object's features)—a possible precursor to agreement; and the combination of gestures in a more phrase-like fashion. Although they don't claim nonverbal gesture to be language, Singleton, Goldin-Meadow, and McNeill (1995) do suggest that it is the first step along a continuum from gesture to language.[7]

Mimicas is essentially equivalent to homesigns, the gestural communication that typically develops within a family or limited social sphere where one member is deaf and no preexisting signed language is available.[8] It can be conventionalized to a certain extent in terms of choices made in labeling objects and actions and to some extent even with respect to the order in which information is conveyed. Like gesture, mimicas is large, often symmetrical, and continuous, with few distinct boundaries between lexemes that can be identified as individual signs.[9] Facial expressions are used for affect and caricature but not in any systematic grammatical fashion. The whole body is used in gesturing, and the communication depends greatly on context and shared knowledge for maximum intelligibility.

7.2.2.2 LSN   In LSN, like mimicas, signs are also large and tend to be symmetrical. There is a greater use of individually discernible signs for labeling objects and actions. Signs become more restricted to the limbs, head, and upper torso. Facial expression in LSN, although still primarily affective, begins to be used for grammatical purposes as well. A brow raise over a single sign can mark it as a topic; an intense wrinkling of the nose, without a co-occurring manual articulation can mean "what's up?"; and a quick raising of the left upper lip along with a less intense nose wrinkle can mean "what's that?" These nose-wrinkle facial expressions are commonly used among hearing Nicaraguans as well. The latter seems to be a combination of pointing with the lips (pointing with the fingers is considered rude) and an "inquiring" nose wrinkle. In LSN, these "grammatical" facial expressions typically occur alone or are linked to a single manual sign; they do not spread over larger constituents or clauses. Some LSN signers mark certain adverbial and aspectual information with mouth gestures often accompanied by distinct vocalizations that are visually detectable via tensing of the neck muscles or position of the tongue. These include intensity (a high-pitched uvular trill), iterativity (a rapid protrusion and retraction of the tongue while vocalizing [blʌlʌlʌlʌlʌ]), completion (an unvoiced bilabial trill; also known as "a Bronx cheer" or "raspberry"), and so on.

In some cases, pointing gestures follow LSN verbs to indicate the participants involved in the action. Even though pointing can indicate multiple participants, only

one full noun tends to be signed per verb. Multiple-argument propositions are often expressed using separate verbs to support each NP argument. We will argue that these sequences of *single-valence verbs* are precursors of a grammaticized serial verb construction. Watching LSN on videotape, one has the sense that it would be possible to neatly cut the tape into a sequence of linearly distinct units.

7.2.2.3 ISN The opposite is true of watching ISN, which is crisper, more fluid, and articulated in a smaller signing space. Signs become almost exclusively restricted to the limbs, head, and upper torso. The use of the two hands is more asymmetric. Signs overlap and coarticulation effects are evident. One hand may hold one sign while another goes on with the next sign or even with whole sentences. The output is multifaceted and orchestrated, with a distinct rhythm and flow.

The face in ISN is used more systematically and in more grammatically distinctive ways. Topic marking (a brow raise) becomes much more frequent and systematic. A facial expression for *wh*-questions (an intense nose wrinkle) appears. Yes/no questions are marked by raised brows, a forward protrusion of the head, and a concurrent shoulder shrug. In contrast with LSN, these nonmanual markers in ISN can spread over more than a single sign; however, we have not yet completely delineated the syntactic domain(s) over which these signs spread. We are only beginning to systematically look at this aspect of the grammar; therefore, the observations noted here should be taken as tentative. It is interesting to note here that, in contrast with identical affective facial expressions shared by ISN and ASL signers, their grammatical facial expressions are considerably different. The furrowed brows that mark *wh*-questions in ASL, for example, are consistently misinterpreted by Nicaraguan signers as signaling anger. In fact, the LSN/ISN sign, ANGRY, involves the index fingers of each hand, in front of the lower forehead, pointing downward and toward each other (e.g., "\/") to indicate furrowed brows.

Aspect marking, sporadically indicated in LSN by mouth gestures and vocalizations, has begun in ISN to be mirrored or replaced with modulations of hand movements. Additionally, many lexical signs eliminate idiosyncratic, co-occurring mouth gestures. For example, the LSN sign for CLEAN is made with a distinctive mouth gesture: the tongue quickly and repeatedly moves laterally back and forth. When an ASL-based manual variant was later introduced into the language, the mouth gesture was associated with that new variant. In ISN, where both forms coexist, the mouth gesture drops out. In recent years, some LSN signers have begun to borrow manual aspect modulations from ISN into their LSN—for example, replacing or supplementing rapid protrusion and retraction of the tongue with verb reduplication to mark iterativity.

The use of pointing gestures is more systematic and differentiated in ISN, and some verbs begin to move between points in space to indicate the role of participants. The number of noun arguments expressed per sentence also increases.

7.2.2.4 PSN PSN, the communication form used between hearing speakers and Deaf signers, is distinctive because it characteristically involves the interspersing, and

sometimes overlapping, of spoken Spanish and Nicaraguan signs, abundantly sprinkled with commonly occurring Nicaraguan gestures. The PSN produced by Deaf signers is vastly different from the PSN produced by hearing Spanish speakers. Furthermore, within each group, there is a great deal of variation that follows from each individual's degree of exposure to their nonprimary communication form. Example (1) illustrates an idiolect of (sign-driven[10] PSN) from a Deaf, LSN-signing[11] student at the vocational school in Managua. This example is excerpted from a dialogue between two LSN signers, signing PSN for the benefit of a hearing observer.

(1) Spoken: amiga   otro   en la casa
    Manual: ALL FRIEND OTHER VAGO ('bum around') WORK [reduplicated] HOUSE
    Spanish: Corrieron a todas las amigas y ahora están trabajando en la casa.
    English: All her other friends were fired and now they are working at home.

    (Sign-driven PSN; Deaf female LSN signer, age 17, 1988; Vocational school (Villa Libertad))

The only morphological inflection that occurs in the "sign" stream is reduplication of the sign WORK to mark the progressive, a common characteristic of LSN. All other signs are completely uninflected bases forms. The extent to which morphological marking appears in the signed or spoken components of PSN depends highly on the individual's language background. The sign VAGO is peculiar to LSN and is difficult to translate directly. It typically means "to bum around" or "a bum," but in this context, it means "out of work, unemployed." When any mouthing does occur with this sign, it is a truncated form of the word *vagabond* that is pronounced [βaγo]. Its part of speech is unclear in this context. The sign articulation here is uninflected for any kind of locative agreement. Typically, if used as a verb, the sign would have a forward motion in LSN. Uninflected as it is, it looks mostly noun-like. Neither LSN nor ISN inflect nouns for gender, so it is not surprising to find a lack of gender marking on FRIEND. Notice that, although feminine gender is marked on the Spanish word *amiga*, there is no gender agreement with the following adjective *otro*. Lack of plural agreement is not clear because Nicaraguan Spanish aspirates syllable-final /s/, suggesting that whatever Spanish is being accessed by Deaf speakers of PSN comes via the spoken rather than written modality.

Exploration of variations from speaker to speaker, and context to context, in PSN could occupy one's research career. Our goal is only to give a flavor of what PSN is like. To do so we must also provide an example of speech-driven PSN from a hearing Spanish speaker who was the teacher[12] in the beauty-salon workshop at the vocational school. Because the Spanish is transparent, we provide only an English translation. We include extra information on eye gaze and facial expression not because these are grammaticized in PSN but to give a better sense of the total visual picture a Deaf signer receives from PSN. We believe that in many cases paralinguistic, nonmanual gestures used with unconscious regularity by hearing Nicaraguans gesturing to Deaf signers or even to each other at home or in these school contexts may inadvertently contribute to what eventually become grammatical building blocks of LSN

and ISN. For example, the fact that this PSN user regularly breaks eye contact with the addressee and looks forward and upward when using the compound future form (e.g., *van a ir*, 'going to go') could eventually be reanalyzed as a future marker by signers exposed to this regularity.[13] Tracking her hands visually while signing a verb of motion followed by a deictic gesture is also suggestive of a potential influence on the grammar.[14] Such behavior occurs with certain motion/location verbs in both ASL and ISN. It seems that such paralinguistic precursors of grammatical devices could begin to play a role even at the earliest stages of homesigning limited to family contexts.[15]

(2) Eyegaze: <u>to addressee</u>
     Manual: WORK   HERE
     Spoken: Esta trabajo es muy importante
     English: This work is very important ...

     Eyegaze: <u>to addressee future</u>   <u>to addressee</u>
     Manual: WHEN/LATER FINISH   WORK GOOD
     Spoken: porque   cuando ustedes   ya   aprendan a trabajar bien, ...
     English: because when you learn to work well, ...

     Nonmanual: <u>brow raise+ + +</u>
     Eyegaze: <u>to addressee</u> <u>follow-hand</u> <u>to addressee future</u>   <u>to addressee</u>
     Manual: GO-OFF   POINT-right WORK   PAY MONEY
     Spoken: ustedes van a ir   a otro   trabajo le   van a pagar los regalos.
     English: you'll go off to another job and be able to pay for things of value (lit. gifts).

(Speech-driven PSN; Hearing female Spanish speaker, late 30s, 1988; Vocational school (Villa Libertad))

By using modality differences, we can clearly distinguish the superstrate and substrate contributions to examples like (1) and (2). Within PSN, we can also see borrowings between spoken Spanish and LSN/ISN. Consider the following contact influence from speech-driven PSN to sign-driven PSN. The spoken form of the Spanish word *casa* 'house', in PSN becomes a mouth gesture or vocalization co-occurring with the sign HOUSE. However, in LSN/ISN this sign is extended in meaning beyond the original Spanish word *casa*. This sign is a special type of noun classifier in LSN/ISN whose reference extends to any members of the class of objects with a peak. This morpheme, which involves two flat hands moving upward to meet at the fingertips (i.e., tracing a roof) can refer to 'house', 'mountain', 'pyramid', and so on. In sign-driven PSN, the extended grammatical function of this morpheme from LSN/ISN is transferred to PSN. But there is a twist. In PSN, the sign HOUSE/ "object-with-peak" is produced concurrent with the mouthing or vocalization of the word *casa* 'house'. But this sign has come to refer to not just 'house' but any member of the noun class picking out objects with a peak. So, in sign-driven PSN, when this sign is used to refer to 'mountain', it still retains the mouth gesture/vocalization for *casa*.

We can easily tease apart PSN from LSN as well, enabling us to track their independent development and independent contributions to the emergence of ISN. Only a few cases of spoken-language influence from PSN have actually been borrowed into ISN. For example, the signs for CHEESE, *WH*-QUESTION, and the verb ASK-QUESTION have a common origin. The signs for CHEESE and *WH*-QUESTION are homophenous (look alike) in LSN. Both involve touching the chin with an extended index and middle finger. The Spanish words associated with these two signs (*queso* and *que es eso*) look the same on the mouth. In LSN, the sign for WHAT'S-THAT was extended to also mean 'who is it', becoming a more general *WH*-QUESTION sign. Eventually, the ASK-QUESTION sign was built from this pattern. In the verb ASK-QUESTION, the movement component has been modified to trace a question mark on the face, index and middle finger starting at the forehead and ending with contact at the chin. Thus, the final part of the verb ASK-QUESTION is identical in form to the *WH*-QUESTION sign. In ISN, *wh*-questions and yes/no questions have come to be distinguished by the two distinct nonmanual markers mentioned earlier: a nose wrinkle for *wh*-question, corresponding to the nose wrinkle in the Nicaraguan gesture "what's up" that eventually became linked to the *WH*-QUESTION sign; and a shoulder shrug, protruding head, and brow raise for yes/no question. The sign for CHEESE, which in LSN is homophenous with *WH*-QUESTION, remains the same in ISN. Whereas signs like CHEESE or WHAT'S-THAT are concurrent with speech in PSN, neither mouthing nor any overt speech co-occurs with these signs in LSN or ISN. Furthermore, whereas a nose wrinkle occurs only over the *WH*-QUESTION sign or alone in LSN, it optionally spreads over an entire clause in ISN.

7.2.3   The Changing Nature of the "Language Pool"

All four communication forms—LSN, PSN, ISN and mimicas—currently coexist in Nicaragua (Kegl 1994). Each is evolving and changing with the progression of time. The LSN (peer-group pidgin) observed on our first visit is vastly different from the LSN found today. The first generation[16] of LSN signers were homesigners brought into contact with other homesigners. In the Nicaraguan case, cohorts are better characterized in terms of peer groups (see Thomason and Kaufman 1988, 9–10), where transmission tends to occur from immediately older to immediately younger members rather than generations. Groups entering the school at later dates had the benefit of exposure to both other homesign systems and to the more elaborated communication (LSN) that had developed among the first-generation homesigners. When very young children acquiring LSN surpassed their models, a new language (ISN) was added to the mix. Thus, the "language pool" to which each new group of signers becomes exposed is itself dynamic and ever-changing. We will discuss two sets of studies that establish LSN and ISN as distinct from one another in grammatically relevant respects and that tease apart two factors contributing to the divergent profiles of LSN and ISN signers: their age at entry into the Deaf community and their chronological year of entry into the Deaf community.

7.3   Measuring the Gap Between LSN and ISN

In 1990, Kegl and A. Senghas began a project designed to construct a linguistic profile of the population of d/Deaf signers in Nicaragua.[17] We began collecting two narrative samples from each deaf person—homesigners, deaf adults whose signed communication is minimal, as well as LSN, ISN, and even some hearing PSN signers. We have currently sampled 270 signers in Managua. We are using two 1.5-minute, nonverbal, Czech cartoons (*Mr. Koumal Flies Like a Bird*, Studio Animovaného Filmu 1969, and *Mr. Koumal Battles his Conscience*, Studio Animovaného Filmu 1971).[18]

The two cartoons were chosen because of their ability to elicit specific grammatical forms in ASL. The "bird" cartoon was chosen for its ability to elicit motion/location verbs, classifiers and specifiers, uses of quantification, aspect marking, and role-prominence marking. The "conscience" cartoon successfully elicits person-agreeing verbs, additional classifiers, complex establishment of referents in the signing space, a wide range of syntactic constructions (in terms of both argument structure and sub-categorization patterns), a wide variety of verb senses, and significant use of role shift (changes in point of view). Each elicits specific grammatical forms that are, in ASL at least, fully mastered only by native signers. These include fine-grained distinctions in classifier choice and the ability to set up certain complex combinations of referential indices in the signing space and to maintain their distinction throughout the narrative and across subsequent shifts in point of view. The recounting of the stories demands grammatical competence and fluency to allow expression of its contents in minute detail.

Mr. Koumal Flies Like a Bird is about a man who climbs a mountain and, seeing a bird flying about, decides he wants to do the same thing. He tries to fly and fails. The bird sees him and laughs, causing some feathers to fall off. Mr. Koumal puts them on his arms, tries again, and fails. The bird, laughing even harder, loses all its feathers. Koumal gathers them up and puts even more on, tries, and again fails, falling into a chicken coop. At night, he takes feathers from all the chickens, which he leaves completely naked looking up at him, puts them all over his body, creating heavy, elaborate wings, and tries again. He swoops a few times and then crashes into the side of the mountain, which collapses on him. As he crawls out of the rubble, he gets an idea. He decides to use the feathers to make Indian headdresses and sell them to children for money.

Mr. Koumal Battles His Conscience involves the same man, who is standing out-side of a restaurant and sees a beggar. He feels generous and drops a coin into the beggar's hat. A rich woman comes up and does the same, but in so doing, a large bundle of money falls unnoticed from her purse. Mr. Koumal sees it fall and battles with himself (in the form of a devil and angel taking control of him) over whether to take the money and have cars, riches, and world travel, or to return the money and be hugged by St. Peter as he enters the gates of heaven. While his good and evil sides battle things out, the beggar sneaks in and steals the money. In the end, Koumal

stands outside the restaurant with his pockets empty and hand extended. The beggar drives by in a huge car and tosses him a coin, which lands in the palm of his hand.

We segmented the stories into component events and coded, for each signer, which events were recounted and which grammatical devices were employed. This enabled us to code narratives where the order of events recounted differed from the order of occurrence in the cartoon. The number of occurrences of each grammatical device in each narrative was counted for each subject. In our initial studies (Senghas et al. 1994; A. Senghas 1994), these numbers were reported in relation to the total number of events recounted. In this study, with an expanded number of subjects, we report the proportion of these grammatical devices in relation to the total number of signs produced in each narrative. Details of our initial coding checklists and preliminary data from some of the LSN narratives were presented by Kegl and Senghas (1991).

7.3.1 Overall Ability to Convey Information

Senghas et al. (1994) compared five LSN (mean age = 25) versus five ISN (mean age = 16) signers' renditions of the "bird" narrative by counting the number of events recounted per narrative to get a gross measure of ability to adequately convey information. Given the same cartoon stimulus, LSN signers recounted only half the events recounted by ISN signers (LSN = 26.8, ISN = 45.4; $p < .05$), usually missing finer details and integrative commentaries on the events. As an index of fluency, we determined the number of signs produced per minute, and again, LSN signers were shown to take twice as long to produce the same amount of information as compared with ISN signers (LSN = 24 events/minute, ISN = 46 events/minute, $p < .05$). Here, we expanded the number of subjects in each group to 15 LSN (mean age = 29; range = 33–26) and 15 ISN (mean age = 19; range = 25–10) signers and coded signs per minute rather than events per minute. This subsequent analysis also revealed a significant difference in fluency between these two groups (LSN = 59 signs/minute, ISN = 74 signs/minute; $p < .05$).

7.3.2 Grammatical Characteristics

Based on what is typically elicited by the Koumal cartoons, we coded LSN versus ISN signers on the basis of a number of grammatical characteristics and their percent occurrence relative to the number of events recounted for the "bird" and "conscience" narratives. The grammatical characteristics we chose to focus on have been found in most of the signed languages[19] studied to data and are known to occur in ISN—spatial inflection, size and shape specifiers (SASSs), handling classifiers, object classifiers, and signs using the whole body. Because many of these grammatical constructions may be unfamiliar, we will describe each briefly before presenting the results.

7.3.2.1 Spatial Inflection Use of space is central to the grammar of any signed language. For example, the grammar of ASL allows a single verb to express subject and non-theme object agreement as well as person and number marking by spatial

agreement of the verb with grammatically established referential index points in the signing space.

(3) top_____
CHILDREN MAN POINT$_i$ $_i$LOOK-AT[distributive]$_{j,k,l}$ (ASL)[20]
'The children, the man looked at each of them.'

The conditions on locative agreement and subject-object agreement in ASL are very different (see Padden 1988). Locative agreement in ASL also involves spatial agreement, however, not with subject and object but rather with preestablished locations. Motion/location verbs in ASL involve applicative constructions that incorporate locative relations into the verb (Kegl 1990, 163; Kegl 1995). They do not spatially agree with the subject. In the following sentence, the verb exhibits spatial (i.e., locative) agreement with the referents of x and y (two locations previously established in the discourse, such as New York $= x$, California $= y$) and does not exhibit any spatial agreement with the subject, MAN:

(4) MAN CL:3 = vehicle[GO-FROM-LOCATION$_x$-TO-LOCATION$_y$]   (ASL)
'The man drove from location x to location y.'

Spatial inflection, in examples (3) and (4) above, involves movement of a verb or locating of a verb to mark agreement with either a person or place whose reference has been linked to that location. Grammatical establishment of spatial indices is a prerequisite to the use of spatial inflection, except in the situation where individuals or locations have obvious real-world locations that can be presumed.

LSN signers do not seem to use any abstract grammatical device to establish spatial indices, especially for people. They do sometimes agree with real-world locations or paths that are in the shared knowledge-base of the signer and addressee. Anaphoric reference in LSN is not typically signaled spatially.

One striking characteristic of both LSN and ISN is the fact that anaphora is frequently realized via a reduced verb form,[21] a construction that appears to be unique to Nicaraguan Sign Language. To produce this form, a verb is truncated to its uninflected form and reduced significantly in amplitude. This reduced form is then used to refer back to the referent in the narrative that last served as the subject of that verb.[22] Thus, the reduced form used to pick out a specific referent changes as the narrative unfolds. For each referent the narrator intends to refer back to, a record must be kept in memory of the last verb with which that NP argument occurred. The process is illustrated in the contrived sample narrative shown in example (5).

(5) X collected feathers from the chickens. The chickens looked up, naked. The collector jumped off the mountain. [e] tried to fly. [e] crashed[23] into the mountain. The mountain crumbled. The flyer raised his arm, still covered with feathers, from the rubble and had an idea.

In LSN, we find some spatial inflection used for locative marking but not for subject or object marking. When person marking is found, it typically involves a single pointing gesture (using an index finger), as in LOOK-AT#point(goal) or a complex

of pointing gestures following the verb that pick out both participants involved, as in SPEAK#person$X$ person$Y$.[24] In these cases, the people referred to are generally present and available as the targets of these pointing gestures. Verbs taking two participant roles semantically but involving a single point to the goal typically have an experiencer subject that is realized by the signer moving or posturing in such a way as to indicate taking on the experiencer's role. Multiple pointing gestures following a verb are articulated as a single pointing gesture that appears to sweep from one location to another.

One might look at the pointing complex that follows verbs like SPEAK and think that it is instead more like a serial verb (e.g., SPEAK+GO-FROM-X-TO-Y), where the action of speaking and the path are expressed separately. Two pieces of evidence speak against such an analysis. First, conjoined subjects are similarly expressed, using the same single, sweeping articulation: DANCE#person$X$,person$Y$. These do not in any way carry the meaning 'person x danced to person y, or from position x to position y.' In fact, to convery the latter meaning, the movement from location x to location y would be more deliberate and tracked by the signer's eyes. Second, we don't see a similar splitting apart in true motion/location verbs: *DRIVE#GO-FROM-X-TO-Y. If verbs of communication used serial verb constructions to convey the path of communication, we would certainly expect to find more literal examples to be possible, such as in the class of motion verbs expressing paths;[25] but examples from this class that involve a verb + path do not occur. In both LSN and ISN, we often see a noun like BUS followed by a verb that traces the path of its movement. This motion/location verb is not cliticized to BUS as the pointing complex is cliticized to its preceding verb. Instead, the handshape used is a flat hand with thumb pointing upward, and rather than a using a sweeping motion, the hand methodically traces the path followed and is tracked the whole time by the signer's eyes. These forms, which are quite common, would be coded as involving spatial agreement.

ISN does have verbs that exhibit spatial agreement for person. In fact, the ISN counterpart of the verb for 'speaking' mentioned above would involve spatial agreement where the verb moves between the location of the speaker and the location of the addressee: person$X$(source)-SPEAK-person$Y$(goal). Interestingly, it is the dropping of encliticized person markers in favor of spatial incorporation into the path of the verb (LOC(source)-SPEAK-LOC(goal)) that is characteristic of the shift from LSN to ISN.

However, in comparing LSN to ISN, we don't see an across-the-board shift from uninflecting to inflecting verbs. Instead, we see in ISN a differentiation into three distinct classes (similar to the classes we find in ASL).[26] Verbs of cognition, emotion, and perception, such as LOOK-AT#point(goal), remain (like their LSN counterparts) uninflected plain verbs followed by an enclitic.[27] Verbs like SPEAK become person-agreeing verbs that move between the subject and object. Literal directional verbs in ISN register movement along a path initiating from the source and continuing to the goal. The LSN forms are relatively similar to what eventually gets systematized and grammaticized in ISN. The only differences involve more constraints on

the nature of path movements in terms of the range of path units to choose from, the movements become less analogical and more formulaic with systematic rules for their combination, and there are more complex embeddings of movements within other movements and additional phonological constraints on what nominal signs are incorporated into complex movements.

7.3.2.1.1 Results   Given the restriction of spatial agreement to the class of motion/location verbs in LSN and the development of spatial marking for person in ISN with the retention and elaboration of spatial marking for location, we predicted an increased occurrence of spatial agreement in ISN as compared with LSN. This was indeed the case. The Senghas et al. (1994) study found that the five LSN signers produced fewer spatial inflections than the five ISN signers (LSN = 13%, ISN = 36%; $p < .001$).

Here, we expanded our pool of subjects to 15 in each category and coded them on both the "bird" and "conscience" cartoons. We added the "conscience" cartoon because it is known to elicit more person agreement. Additionally, because there were clear differences in the use of spatial inflection for person agreement versus locative marking in LSN versus ISN, we analyzed these two inflections separately. The data in these expanded studies were coded in terms of grammatical features (in this case, person versus locative inflection/the number of signs (not events) in the narrative). We predicted that LSN would have few cases of person agreement[28] but would have some locative agreement, although less than would be expected for ISN. The results of coding confirmed our predictions: person agreement/total signs (LSN = 9%, ISN = 42%; $p < .001$); locative marking/total signs (LSN = 20%, ISN = 52%; $p < .001$).

Lumping the two categories together (replicating the Senghas et al. (1994) study except in proportion to total signs rather than events), we get an even greater divergence between the two groups. Again, LSN signers produced significantly fewer spatial inflections than ISN signers (LSN = 28%, ISN = 94%; $p < .001$). The extremely high percentage of spatial inflections in ISN attests not only to its increased spatial inflection but also reflects the high percentage of verbs as opposed to other categories in ISN sentences. Although we haven't completed the linguistic analysis, this observation fits with the fact that ISN allows null arguments. Independent of the occurrence of spatial inflection, both LSN and ISN seem to be strongly "verb-centered."

7.3.2.2 Size and Shape Specifiers (SASSs)   SASSs were first described with respect to the analysis of ASL (Newport and Bellugi 1978; Klima and Bellugi 1979) as bound forms that generally appear as members of compounds specifying the size and shape of some object, such as rectangular, cylindrical, pipe-shaped, or long and thin: RED^RECTANGULAR 'brick', LETTER^RECTANGULAR 'letter or postcard', PICTURE^RECTANGULAR 'photograph', GLASS^RECTANGULAR 'tile', or STAMP^RECTANGULAR 'book of stamps'. According to Newport and Bellugi, SASSs are generally formed by tracing the general size and shape of the object in two- or three-dimensional space. Certain size distinctions, like the difference between

a postage stamp, an envelope, and a piece of typing paper, would necessitate the use of three distinct but related SASSs. However, within certain limits (e.g., brick, postcard, telegram, envelope, ...), the same unvarying SASS would be used. Newport and Bellugi distinguish SASSs, which are taken to be lexicalized bound morphemes, from mimetic depictions, which use tracing gestures to fairly carefully depict the size and shape of an object when no conventionalized SASS is available. These mimetic depictions also occur in compounds, typically paired with some basic-level category term to refer to subordinates within that category, as in SCISSORS^"tooth-edged" for 'pinking shears', SAW^"curved-bow, with ends connected by tooth-edged-line" for 'hacksaw', and so on.

Both LSN and ISN signers use SASSs. Examples (6a–c) show some of the more common SASSs with compounds that include them. (Notice that in contrast with ASL, the LSN/ISN SASSs appear initial in these compounds, preceded only by color terms.)

(6) a. *LARGE-RECTANGULAR-OBJECT (LRO)*
      LRO^WINDY   'air conditioner'
      LRO-large^WATCH[29]   'movie'
      LRO^TURN-DIAL   'television'
      LRO^DANCE   'radio'
   b. *OVOID[30]-OBJECT*
      OVOID-large-long^CUT-LENGTHWISE   'papaya'
      OVOID-large^HANDLE-OVOID-large^WHACK-   'coconut'
      OFF-TOP^DRINK   'pitaya, cactus fruit'
      RED^OVOID^CUT-WIDTHWISE
   c. *FLAT-CIRCULAR-OBJECT (FCO)*
      (one handed) RED-FCO   'ficha, bus token'
                 FCO-large^EAT   'cookie'
                 FCO-small^PLANTverb   'seed'
      (two handed) FCO (location = head)^WINDY   'hair dryer'
                 FCO (location = hand)^SWEAT   'palm sombrero,
                                                   straw hat'
                 FCO^mouth:blow (location = above)   'birthday cake'

In coding LSN and ISN, we lumped SASSs and mimetic depictions tracing shapes into a single category, despite the fact that there also exists in LSN/ISN a distinction between lexicalized SASSs and nonlexicalized mimetic depictions. Under the characterization of SASSs presented by Shepard-Kegl (1985), these two forms fall together and are both treated as involving deverbal nominalizations,[31] where the tracing of the shape, modulated for size distinctions, is a verb that is subsequently nominalized to refer to an 'x-shaped object of a particular size." Although we recognize the value of distinguishing lexicalized versus nonlexicalized SASSs, we lumped these forms together in a more general grouping in order to possibly capture precursors to SASSs in the signing of homesigners that we also coded on these narratives.

7.3.2.2.1   Results   Given the prevalent use of SASSs and mimetic depictions for size and shape observed with LSN signers in 1986, and perhaps swayed by the abundance of SASSs elicited when we collected the signs for fruits, vegetables, and farm implements while compiling the Nicaraguan Sign Language video dictionary, we predicted that the occurrence of SASSs would be equal or possibly greater in LSN that in ISN. Based upon the narratives elicited by the Koumal cartoons, we were wrong in our predictions. The SKSC (1994) pilot study found that, although the occurrence of SASSs was low overall, ISN signers produced significantly more of these forms than LSN signers (LSN = 1%, ISN = 7%; $p < .05$). Increasing the number of subjects to 15 in each category yielded similar results (LSN = 4%, ISN = 7%, $p < .05$). The low occurrence is understandable when we recognize that the Koumal cartoons typically elicit basic-level items except for a few instances listed in (7).

(7) FLY$_{nom}$^TRIANGULAR-thin-from-face(beak)   'eagle'
    CYLINDRICAL-thin-long^CRESCENT-large   'pickaxe'
    ARM^TRACE-CURVE(wing)   'wing'
    CRESCENT(in sky)   'moon'
    TRIANGULAR-wide-from ground-up)   'mountain'
    OVOID-large^CLOSE$_{verb}$ 'end daydream'

Despite the low occurrence, the differences between the two groups appear to remain stable.

7.3.2.3   Classifiers   Classifiers[32] are another characteristic feature of signed languages around the world. The SASSs described above function like noun classifiers, picking out groups of objects that share certain basic size and shape characteristics and taking a modifier. An even more productive component of LSN and ISN involves verbal classifiers of two types: object classifiers and handling classifiers. Both classifier types are articulated concurrent with the movement of the verb. As in ASL, they occupy the theme slot—that is, the position for the thing that moves in a verb of motion and the thing that is located in a verb of location.

Object classifiers are typically one-handed, bound morphemes that pick out classes of objects on the basis of physical or abstract characteristics like the following examples that occur in both LSN and ISN: small-animal (e.g., cat, dog, mouse, rabbit, chicken), vehicle (e.g., airplane, car, motorcycle, bicycle), flat-object (e.g., shelf, book, window pane (cantilevered type), mirror), long-thin-object (e.g., sewing machine needle, paintbrush, pencil, cross-stitch, fishbone stitch, hair roller, furrowed brow), hooked-object (e.g., hanger, spider stitch, fishhook), and so on. Although these classes also exist in ASL, the actual classifiers differ in form. For example, small-animal in ASL is a V-handshape with the fingers hooked, whereas in LSN/ISN it is an L-handshape with fingertips oriented downward; the vehicle classifier in ASL is a 3-handshape with thumb, index, and middle finger extended, but in LSN/ISN it is a flat hand with palm oriented downward. Furthermore, membership in these classes varies from language to language. For example, the vehicle class in ASL does not include airplanes. Airplanes make up their own class and are represented by a hand-

shape with pinkie, thumb, and index finger extended. In ASL, paintbrushes fall into the class of narrow-flat-objects rather than long-thin-objects.

Handling classifiers classify objects in terms of how they are handled: handle-flat-bottomed-object (e.g., a plate), handle-small-object (e.g., a marble), handle-narrow-flat-object (e.g., a measuring tape), handle-string-like-object (e.g., thread), handle-cylindrical-object (e.g., the handle of a rake), and so forth. There are some differences here between LSN and ISN. For example, in the class of handling-cylindrical-object, LSN signers often use an O-handshape, leaving a space for the object grasped. In ISN, this handling classifier is realized as a closed fist. Also, the handle-cylindrical-object classifier in both LSN and ISN can express degrees of width of the cylinder—narrow (a baseball bat), medium (a glass), and wide (a garbage can). However, a bottle of talcum powder that falls halfway between narrow and medium gets the open narrow handling classifier in LSN but the medium handling classifier in ISN.

Although LSN and ISN both have object and handling classifiers, given a choice, LSN signers tend to favor the use of handling classifiers in situations where object classifiers would be preferable. LSN signers tend to use object classifiers only in situations where a handling classifier is prohibited—for example, for a sewing-machine needle, they use an object classifier; but to distinguish a typical sewing needle from a straight pin, they use a handling classifier and vary the nature of its movement, using a circular repeated motion for sewing versus an abrupt straight down movement as in pushing a pin into a pin cushion. ISN signers use handling classifiers as well but more systematically and more sparingly. They use a wider range of object classifiers, in more situations, and for a greater number of nouns.

7.3.2.3.1 Results Because handling classifiers follow so naturally from mime and the whole-body types of gestures seen in homesign, we expected LSN signers to exhibit a natural progression where gestures using the hands develop naturally into more conventionalized handling classifiers. Object classifiers on the other hand are more a product of grammaticization. For example, in naturally occurring gestures and mime, to use one's hand to represent an instrument being used instead of the way one would hold that object is considered incorrect. Such articulations are so rare in everyday gesture that the behavior is considered to indicate a deficit with respect to the cognitive representation of movement called *apraxia* (see Heilman and Rothi 1993; Rothi et al. 1988). The use of object classifiers seems to come about only when gestures become language. If, as we contend, LSN marks the beginning of the linguistic use of gesture, but ISN marks a quantum leap to a full-fledged signed language, we might expect a rise in the use of object classifiers to signal that leap.

We predicted that ISN signers would use more object classifiers than LSN signers. Furthermore, we predicted that LSN signers who seemed to be using handling classifiers in places where ISN signers were using object classifiers might produce a higher percentage of handling classifiers than ISN signers would. Our predictions were confirmed in the case of object classifiers. In the Senghas et al. (1994) study, ISN signers used significantly more object classifiers than LSN signers (LSN = 2%, ISN = 25%,

$p < .005$),but there were no significant differences in the use of handling classifiers across the two groups (LSN = 22%, ISN = 15%; $p = .184$). Increasing the number of subjects coded, again proportional to the total number of signs not events, did little to change the picture. Although the separation between LSN and ISN signers on their production of classifiers became less dramatic, the results still point to a significant difference only in terms of the production of object classifiers (LSN = 8%, ISN = 14%; $p < .05$). The percent production of handling classifiers across the two groups continued to show no significant difference (LSN = 14%, ISN = 12%; $p = .25$).

What isn't evident in these results, but becomes evident in viewing the tapes, is the degree to which ISN signers make new, more restrictive, distinctions between morphemes serving as handling classifiers (typically associated with agency and causation) and object classifiers (typically associated with patients). Similar to constructions marking causation in ASL,[33] ISN signers include handling classifiers in verbs attributing agency to the subject of the sentence. In instances where no agent is implied or explicit nonreference to any agent is made, ISN uses an object classifier. LSN blurs this distinction, using handling classifiers in both situations (causatives and inchoatives)—like saying *somebody closed the door* to mean *the door closed on its own.*

7.3.2.4 Whole-Body Signs One look at LSN versus ISN reveals that in LSN the signing space is larger, the hands are used more symmetrically, and the signing in general is less fluid with far less coarticulation. Whereas ISN has many signs that use the signer's full upper body and does at times allow the fluid incorporation of natural gesture as well caricature signaling that the narrator had taken on the role of some third-person referent, LSN clearly seems to involve more of a mix of gesture and sign. To quantify this, we coded the percentage of mime-like/full body signs that occurred in the LSN versus ISN Koumal narratives. For the "bird" narratives coded in the Senghas et al. (1994) study, which clearly lend themselves more to the use of mime than the "conscience" narratives do, LSN signers produced a significantly higher percentage of whole body signs than the ISN signers did (LSN = 61%, ISN = 35%, $p < .05$). Increasing the number of subjects to 15 in each group and adding the less mime-eliciting "conscience" narrative narrowed the gap between LSN and ISN signers but still revealed them to be significantly different on this measure (LSN = 38%, ISN = 28%, $p < .05$).

7.3.3 Summary of Coding and Analysis of Results
We presented data from Senghas et al. (1994) that show that ISN signers convey more information per unit of time than LSN signers do. In other words, their signing is more fluent and more efficient in conveying the message. The follow-up study presented here that increased the number of signers in each category to 15 and looked at the percent occurrence of a variety of grammatical features relative to the number of signs produced across the two narratives replicated the results from the Senghas et al. (1994) pilot study. Two significant indications of the gap between LSN and ISN were

found to be: (a) the increased use of spatial inflection, especially with respect to person agreement with subject and object; and (b) the increased use of object classifiers. Also, there is a significant decrease from LSN to ISN in the use of mime-like gesture.

7.3.3.1 Age at Entry versus Year of Entry The studies reported roughly classified LSN and ISN signers based upon their ages. A clear difference is shown to exist between younger (those born in 1970 or after; ISN signers) and older signers (those born before 1970; LSN signers). The younger the signer, the more fluent and complex the language form.

Several factors may account for these differences. Experimental studies on ASL have established that the age of a child at the time of entry into school (the community) can be a factor because children who have been exposed to a language at a younger age achieve greater fluency in that language than children exposed later in life (Newport 1990; Mayberry 1993; Mayberry and Groschler 1994). However, if Nicaraguan Sign Language (the language pool) is changing and developing over time (i.e., becoming richer and richer grammatically), as we contend, then the actual chronological year in which a child enters school may also be a factor. A child entering the Deaf community more recently is presumably exposed to a richer signing environment than a child who entered in the early years just after the schools were established.

Senghas (1995a) tackled the problem of teasing these two factors apart. Senghas analyzed an excerpt of the "conscience" narrative from 25 signers in the population study on the following grammatical characteristics: how many overtly realized arguments a verb can take in a single clause, which specific inflections can be realized on the verb, and whether those inflections mark agreement with other words in the narrative. At the time of testing, these signers ranged in age from 7;6 to 31;11, with a mean age of 21;1. Their age at entry ranged from birth to 27;5, and their year of entry ranged from 1978 to 1990.

For all analyses, subjects were grouped by age at entry (young: 0;0–6;6, $n = 8$; medium: 6;7–10;0, $n = 8$; old: 10;1–27;5, $n = 9$) and year of entry (before 1983, $n = 13$; and 1983 or later, $n = 12$). The details of the statistical analysis performed are published in Senghas 1995a. We will only summarize her results here.

Age of entry (3) by year of entry (2) analyses of variance (ANOVAs) were conducted on (a) the proportion of verbs with two or more arguments, (b) the number of inflections (person inflection, locative or orientation inflection, and aspectual markers), and (c) agreement (a situation where the inflection on a given sign corresponds to an inflection on a previous word in order to coindex them or to refer to the same argument. A main effect for both year of entry and age at entry was found for all three grammatical markers. The proportion of verbs supporting two or more arguments was proportionally twice as large both for signers who entered after 1982 and for signers first exposed to the language at a young age. The same pattern of results was found for the analysis of numbers of inflections per verb and amount of agreement per verb. The number of inflections and amount of agreement per verb was greater overall for signers who entered the community after 1982 and for signers

exposed to language at a young or medium age. Young and medium age signers benefited particularly by a later year of entry (i.e., exposure to a richer language input). Older signers showed no effect of year of entry.

The age at entry findings fit with theories claiming that children's language-learning abilities decrease with age and that a critical period for language acquisition exists, beyond which no amount of exposure will afford native-like mastery of a language. The year of entry results strongly suggest that the language has become measurably richer over the last 16 years as new generations of deaf children have acquired it. The combination of the two results fits well with the clearly observable fact that, in the Nicaraguan Deaf community, the most proficient signers are its youngest and newest members. The results of the Senghas (1995a) study are presented and discussed in greater detail in Senghas 1995b.

7.4 Evidence for Language Genesis

The converging evidence from these narrative production studies is consistent with the hypothesis that what we have been observing in Nicaragua is the emergence of a new signed language in a situation where before there was none. The statement that no signed language existed in Nicaragua prior to the late 1970s demands proof.

Many sign-language researchers have been hesitant to accept that there could have been no preexisting sign language in Nicaragua in the late 1970s (Carlos Sanchez, personal communication; Ceil Lucas, personal communication), assuming along with George Veditz (1913), a former president of the National Association for the Deaf in the United States, that "As long as we have Deaf people on earth, we will have signs ...."[34] Placed in context, however, we discover that these words were a battle cry from a leader of Deaf people in the United States who saw a powerful movement toward banishing the use of signs in favor of speech led by Alexander Graham Bell ("oralism") as a threat to the very existence of ASL. In his emotional speech, preserved on film by the National Association of the Deaf, Veditz was preserving for posterity the sign language that he, and many others, feared might be in jeopardy. In the United States, despite decades of oralism, sign language remained, passed on from generation to generation by Deaf children of Deaf parents and by means of an "underground" social organization in churches, in the dorms but not the classrooms of residential schools for Deaf children, and in Deaf clubs.

In Nicaragua, if a sign language did exist in its distant past, the social network needed to preserve it (Deaf people in contact with other Deaf people) was lost. R. J. Senghas (1994) and R. J. Senghas and Kegl (1994, to appear) review the social and political context existing in Nicaragua over the last half century, which resulted in the complete isolation and language deprivation of earlier generations of deaf individuals and documented the conditions that changed in the late 1970s to allow Deaf people to come together as a community.

From at least the early 1900s, wealth was concentrated in the hands of a very few rich Nicaraguan families. This made life untenable for poor people, made education

inaccessible to most, and made social services a nonpriority. In 1934, Nicaragua came under the control and economic exploitation of a single family of dictators, the Somoza family. The Somozas continued the tradition of extreme exploitation. To top things off, in 1972, an earthquake measuring 7.2 on the Richter scale flattened the capital city, Managua. The dictator at the time, Anastasio Somoza, stole almost 90% of the international aid money sent to help rebuild the city. Finally, Nicaraguans had had enough. The result was a popular revolt.

Prior to the triumph of this revolution in 1979, deaf individuals did not attend public schools[35] and did not socialize or intermarry. In fact, they were not only isolated from one another; many were virtually sheltered or hidden from society. Deaf and hearing people alike report that there was a strong stigma attached to being deaf. Even today, most older deaf people (those who were adults before the revolution) go largely unnoticed until a family caretaker becomes very ill or dies, at which point social workers discover them during intervention efforts.

In the United States and Europe, hereditary deafness results in the situation where a constant 6–10% of the Deaf population consists of Deaf children of Deaf parents. In Central and South America, Deaf children of Deaf parents are far less common. In Nicaragua, they are virtually nonexistent. We have worked for the past 13 years with the major national organizations serving Deaf people as well as directly on a large scale with the Deaf community itself and, despite pointed searching and questioning, have identified only two cases of a deaf child with a deaf parent. This is not to say that hereditary deafness does not exist. We have identified a few families with a history of deafness, but socialization and intermarriage of Deaf people is so recent that this hereditary deafness rarely expresses itself by yielding Deaf children of Deaf parents.[36] We offer the dearth of Deaf children of Deaf parents as further evidence that the socialization between Deaf people was suppressed before the late 1970s.

Our final piece of evidence comes from self reports. We have asked every Deaf person, every family member of a Deaf person, every teacher or professional who had any contact with Deaf people prior to the mid 1970s, every social service organization, and as many older people as we could find, if they ever saw deaf people signing or using mimicas with each other. Having asked hundreds and hundreds of people, the general answer is, "Absolutely not." However, in the summer of 1995, Kegl and R. Senghas learned about several deaf individuals who attended a small private school together in the 1940s. One of these individuals, interviewed by Juan Carlos Druetta, a Deaf lexicographer from Argentina, was able to provide several old signs used at that time, including an old sign for Nicaragua, which uses the index and middle finger of the dominant hand and the index finger of the nondominant hand to form a triangle (a symbol appearing in the flag). R. Senghas, Druetta, and several members of ANSNIC are currently following up on these initial leads and interviewing this individual in greater detail. Members of this group are not currently in contact with one another or integrated into the Deaf community. Since numerous Deaf people in Nicaragua themselves are on the active look-out for such cases and as

yet have identified only this one case, we are confident of our report that no pre-existing signed language was available in Nicaragua immediately prior to the late 1970s.

This first large-scale contact between deaf individuals occurred with the establishment of public schools as part of the postrevolutionary Literacy Campaign. The new Sandinista government had a serious commitment to providing a minimum fourth-grade education to everyone. By 1980, schools for special education had sprung up across the Pacific Coast, the largest being in Managua. Here, over 500 deaf children came together over the course of a few years. Each brought with them, to varying degrees, their own idiosyncratic homesign system.

From this point, rapid changes began to occur in both the communication and community of d/Deaf individuals in Nicaragua. R. Senghas Kegl, and A. Senghas (1994) and R. Senghas and Kegl (1994, under review) analyze changes in the community, characterized by an initial lack of "deaf identity," followed by a period of grassroots socialization, eventually supplemented (at times challenged by) a more hierarchical "corporate structure" of a Deaf association, and finally the stabilization of a well-oiled machine with a reasonable amount of political clout. We will outline here the language side of things.

7.4.1   Mimicas to ISN

When homesigners came together in the schools, they began to share homesigns, quickly leading to more and more shared signs and grammatical devices. The end product of this melting pot of homesigns is what we call early LSN.[37] Very soon, a coexisting, but distinct, fully articulated signed language form (ISN)[38] came into use, but only by those children who entered the schools at very young ages (roughly before 7)—ages well below the end of their critical period for language acquisition. The educational philosophy of the primary school was oral. Teachers used only fingerspelling as a precursor to speech. The signing that developed arose directly from the contact of Deaf students with each other, without any influence from pedagogical or methodical signs (artificial sign systems designed to encode a spoken language on the hands). Although signing was tolerated in the schoolyard and on the buses, children were not allowed to sign in the classroom or with their teachers.

7.4.2   PSN

By the time that ISN began to take hold on a school-wide scale at the primary school, entire groups of older signers (usually, age 15 and older) had already moved on to the vocational school. For a brief period (until about 1988), the vocational school was populated solely by LSN signers. In the vocational school, teaching was for the most part by demonstration and copying of skills. Use of signs between students in the workshop environment was allowed, and in some case, the teachers themselves used a mixture of signing and speaking with the students (PSN). The students, in turn, used PSN with their teachers and other hearing staff members.

7.4.3 The Changing Face of the Deaf Community

Early on at the vocational school, students used primarily LSN with each other. Even dyslexic students, who were hearing, used LSN (without any concurrent speech) with their deaf classmates and sometimes even with each other.[39] 1987 saw the first trickle of ISN signers into that school and concurrently into the "adult" Deaf community. By 1988, tensions were already growing in response to the young upstarts, who signed differently, and thought they "knew it all." By 1990, the Deaf Association, which had existed on a shoestring since 1987, had its own headquarters, executive board, and internal conflicts. Dyslexics were no longer socialized into the Deaf community. By 1993, although LSN signers held most positions of power in the association (by virtue of their age), ISN signers were accepted and active members of the group as well. In fact, at this point, the fluency of the younger signers became an object of respect, and we began to see a feeding back of many grammatical devices from ISN into the signing repertoire of many LSN signers. 1993 also saw the beginning of a "standardization" campaign, which paralleled the literacy campaign of the 1980s. Signers (usually at least 30–40) would come together at the association headquarters in Managua to discuss among themselves their usage and choice of signs. Bus fare was provided to signers from more remote areas as well. A subset of these signers went back to or regularly traveled to more remote areas to teach sign-language classes. These were classes for Deaf people who already signed. They were designed to, in their terms, "improve and standardize" their use of Nicaraguan Sign Language, to link signs to Spanish glosses for the purpose of sharing sign language with hearing people,[40] and to provide Deaf people with labels they could link to the various usages of certain signs. These standardization classes served a dual purpose. On the one hand, they standardized signing and transmitted a sense of Deaf pride and advocacy skills. On the other hand, they became a vocabulary course in Spanish taught by Deaf signers with more literacy skills to the majority of Deaf signers with little in the way of literacy skills. In a way, when LSN/ISN took hold, it afforded a way for the Deaf community to begin to access Spanish.

7.4.4 Proposed Model of Language Emergence in Nicaragua

Figure 7.1 summarizes the account of the emergence of ISN presented by Kegl and Iwata (1989) and further supported in this paper. The fact that, in general, younger signers in Nicaragua exhibit much more fluency and grammatical complexity than older signers attests to the *recent* emergence of a full-fledged sign language. But, did this language evolve gradually over time as homesigns became more and more conventionalized with use by a wide range of Deaf people? Or, did ISN arise abruptly when very young children radically restructured a highly variable, less than optimal signed input by bringing their innate language capacities to bear in acquiring it?

The results of our narrative studies support the latter possibility. Evidence of significant enrichment in the signed language had already appeared prior to 1983, indicating that the qualitative difference between LSN and ISN appeared quite early but only in children under the age of 10. This enrichment gradually increased thereafter, but again, only children who were exposed to the community of signers before age 10
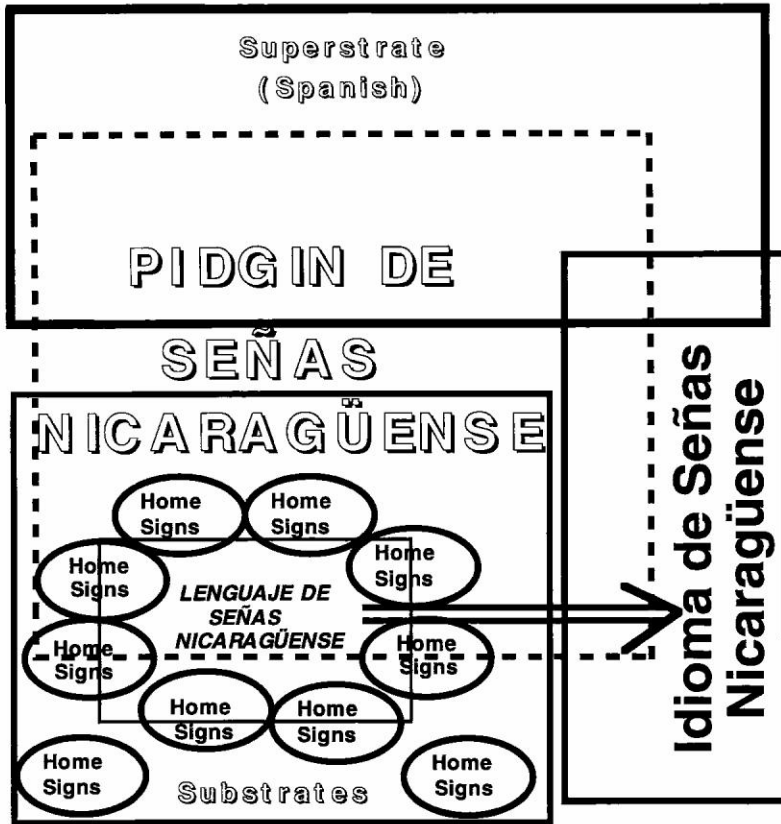
Figure 7.1
Summary of the process of language emergence that occurred among Nicaraguan Deaf signers.

were able to benefit from the richer signed input. Homesigners who remained isolated from the Deaf community over the same period of time showed no increased fluency or grammatical complexity over the same time span (Kegl and Morford 1995; Morford and Kegl, in press). In fact, the older they became, the more exacerbated the effects of their language deprivation on both their linguistic and cognitive capacities. Signers over the age of 10 gain gradual fluency in LSN but never show native-like mastery of ISN as reflected by fluency and grammatical complexity in their signing.[41]

7.4.4.1 Critical Period The existence of an innate capacity for language does not automatically guarantee that this innate capacity will always be available. Lenneberg's (1967) critical-period hypothesis proposed, without direct evidence, an optimal period in childhood for language acquisition extending roughly from infancy to puberty. Evidence for this hypothesis has been accumulating ever since: cases where language fails to be acquired (Lane 1976; Curtiss 1977, 1988); maturational

constraints on language learning (Newport 1988, 1990; Mayberry 1993); and cases where learners surpass their models (Newport 1982; Singleton and Newport 1987; Singleton 1987, 1989). Social prerequisites for full expression of the innate capacity for language also exist (Lane 1976; Curtiss 1977, 1988; Washabaugh 1986). These cases are reviewed and analyzed with reference to the Nicaraguan situation by Kegl and Morford (1995) and Morford and Kegl (in press).

Our results contribute new and direct evidence in support of the critical-period hypothesis. Young acquirers (<7) were able to use their innate language capacities to "make sense of" or fill in the grammatical holes in the LSN input they were exposed to, whereas slightly older signers ($7 < \cdots x \cdots <16$) could reach a certain consensus with one another on general communication strategies but had to learn to make do with less than the optimal innately determined blueprint for language use. The "filling in of holes" by young acquirers yielded a situation in which learners surpassed their models, acquiring and creating a qualitatively different language. The end result of the acquisition process—creation of a new language—begs for comparison with certain existing accounts of language emergence and language change, in particular theories of creolization.

7.4.4.2 Innate Capacity Bickerton (1981, 1984) proposed the Language Bioprogram Hypothesis. This hypothesis claims that a child exposed to nonoptimal or insufficient language input, such as a pidgin, will fall back on an innate language capacity to flesh out the acquisition process, subsequently creating a creole. This is argued to account for the striking similarities among creoles throughout the world.[42] As Marantz (1984) reminds us in his commentary on Bickerton, "poverty of the stimulus" (Chomsky 1980, 34) is a basic factor in all language acquisition. Chomsky's early formulation of the issue follows:

I think that if we contemplate the classical problem of psychology, that of accounting for human knowledge, we cannot avoid being struck by the enormous disparity between knowledge and experience—in the case of human language, between the generative grammar that expresses the linguistic competence of the native speaker and the meager and degenerate data on the basis of which he has constructed this grammar for himself. (Chomsky 1968, 68)

In typical child language acquisition, children hear only a fraction of the possible sentences in their native language, yet they are still able to master its complex rules and use them productively. In other words, children's input is not logically sufficient to lead them to a full grammar unless they are aided by an innate language faculty. So the child creolizing a language is doing nothing different from any child acquiring language. It's just that there is more information available from a natural-language model to determine the choice of more marked, yet still universally available, grammatical options. And thus, the typical case of child language acquisition will lead to a greater degree of linguistic conformity to the input language. In this paper, we focus on the arrow between LSN and ISN in figure 7.1 and ask whether the process indicated by that arrow should be labeled "first language acquisition," "creolization," or both.

7.5   Language Genesis from a Creole Perspective

The literature on pidgins and creoles is far too extensive and heterogeneous to review adequately here (see Mühlhäusler 1986; Thomason and Kaufman 1988; Holm 1988, 1989; DeGraff (this volume, a,b); among others). This literature seems to instantiate almost every viable hypothesis concerning creole genesis. Convincing argumentation has been put forward for each account. Creolization can be gradual or it can be abrupt. The crucial catalyst to creole genesis can be children acquiring it as a first language or adults relexifying their own primary languages to conform to a second language's lexicon. The substrate may need to consist of multiple mutually unintelligible and typologically distinct languages spoken by relocated peoples, or any or all of these requirements may be relaxed. A pidgin can serve as an intermediate stage in the creolization process, it may never creolize, or creolization may be immediate upon the emergence of a contact language. The grammar of a creole may be minimally or strongly influenced by the languages that exist in its history and environment, or it may have little genetic[43] relation to them whatsoever. Pidgin and creole genesis can be strongly linked to power asymmetries between groups of language users, or it may not. The linguistic characteristics of creoles can be characterized by a core set of grammatical features—under some theories, these grammatical features are unmarked and present in all creoles, whereas under other accounts, they are frequently instantiated among the world's creoles, with none invariably present in every creole. The theories and descriptions of pidginization and creolization are as varied and diverse as the conditions under which they arose. However, all these apparently random contradictory observations turn out to be the result of reasoned, well-documented, strongly argued analyses. Creole genesis is complex, and the nature in which it manifests itself is situation dependent.

In some highly idealized abstraction, best (but not perfectly) exemplified by the Atlantic-type plantation creoles, the process involves (to varying degrees) a superstrate language, a set of distinct substrate languages, a pidgin/contact language (however long-lasting or transient)[44] that arises between them, and a creole that develops out of this pidgin/contact language. There is assumed to be a grammatically discernible difference between these two language forms. Creolists roughly agree on these components of the process, although the mechanisms by which the process proceeds are clearly a matter of debate. It also seems to be a matter of consensus that the contact languages giving rise to both pidgins and creoles (the superstrate and substrates) are full-fledged languages[45] (e.g., English, Spanish, French, Portuguese, Dutch, Ewe, Yoruba, Kru, Tahitian, Zulu Xhosa, Nootka, Hawaiian, etc.). Furthermore, the constructs of "pidgin" and "creole" are considered to be continua (with many varying instantiations along each) rather than discrete homogeneous entities.

It is from this idealized locus of convergence that we begin to highlight several assumptions, issues, and debates that the Nicaraguan data have a direct impact on. The first assumption to be challenged is that language necessarily comes from language.

7.5.1   Assumption: Languages Beget Pidgins and Creoles

One standard characterization of the development of a pidgin is as follows: Those with less power (speakers of the substrate languages) are more accommodating and use vocabulary from the language of those in power (speakers of the superstrate).[46] Meaning, form, and usage, however, may be influenced by the substrate languages (Holm 1988). When superstrate speakers are dealing with substrate speakers, they are said to adopt certain salient features of the substrates to make themselves better understood and no longer restrict themselves to the standard usage of their own language. The result of this mutual accommodation is a cooperation among groups in the creation of a makeshift language that serves their needs. This *pidgin* typically involved a reduced lexical and syntactic inventory as well as the morphological leveling of inflections.

7.5.1.1   The Challenge   The Nicaraguan situation pushes the boundaries of what we might consider to be components of the creolization process in numerous ways. First, the only potential superstrate was Spanish, a language inaccessible to Deaf people via the auditory modality and whose transmission via the visual modality is seriously compromised by the ineffectiveness of lipreading as well as the lack of literacy. Second, and more important, the only candidates for substrates were not languages but homesign systems.

7.5.1.2   Superstrate Candidates   Spanish was the language of the oral schools that Deaf students began to attend in droves in the early 1980s, where they were taught minimally to lipread, pronounce, and read it. In a ways, the Deaf school served as the "plantation," relocating Deaf students daily by bus from their homes to an environment where they and hundreds of other homesigners came into contact in the context of being educated by Spanish speakers. The teachers in the primary school were not allowed to "sign" with the students. They used speech and fingerspelling only, unavoidably supported by gesticulation that was characteristically Nicaraguan. However, students typically left these schools as functional illiterates with minimal lipreading skills. There was no alternative signed superstrate available because contact with other signed languages prior to the late 1970s was nonexistent. In the second half of the 1980s, contact was limited to an occasional visitor from another country. Until 1992 (when the Ministry of Education started advocating the use of Nicaraguan Sign Language in the classrooms), teachers at the school neither used nor knew any signing, including artificial manual codes for Spanish.

A further complicating factor is the fact that, unlike hearing students who come to school with a first language already under their belts, deaf students are entering school without a first language. All of their parents were hearing nonsigners. So, their already limited access to this "superstrate" is compromised further by the fact that they have no first-language base to rely upon in extracting information from the "superstrate" input.

7.5.1.3 Substrate Candidates The only potential substrates are gestural homesign systems that are not themselves full-fledged languages. We know this to be the case because deaf individuals left in their homesigning environment past their critical period for language development show permanent effects of language deprivation and even with subsequent intensive exposure are unable to acquire even the rudimentary aspects of human language grammar beyond naming. Again, no preexisting full-fledged sign language was available.

Yet, brought into a contact situation young enough, homesigners do acquire ISN natively. Those brought in later, but still within the critical period for language acquisition, exhibit late-learner characteristics[47] but are able with exposure to master LSN as well as effectively borrow some of the grammatical devices from ISN into their signing.[48] At best, however, they continue to look like second-language learners rather than native signers of ISN.

We conclude that the emergence of a new signed language in Nicaragua seems to have taken place without any full-fledged language input, certainly with respect to the contribution made by the substrates. In other words, it doesn't take language to make language. Language capacity was there all along. Therefore, although the typical context of creolization involves full-blown language substrates, they are not a necessary condition for creolization to occur. We will argue later that this point has crucial implications for the debate between the Language Bioprogram Hypothesis versus the African Substratum Hypothesis.

7.5.2 Assumption: Only the Superstrate/Substrate Pidgin Feeds the Creolization Process

A standard assumption in the pidgin and creole literature is that a single asymmetric pidgin emerges as a result of contact between the superstrate and substrate, and that *subsequently*, under some circumstances, groups of substrate speakers with mutually unintelligible languages adopt this pidgin for purposes of communicating among themselves. At this point, stabilization of the pidgin is said to occur (Mühlhäusler 1986). There are two assumptions here: (a) the desire to communicate among mutually unintelligible substrates necessarily temporally follows the establishment of the superstrate/substrate pidgin; and (b) the substrate speakers would not directly establish a pidgin/jargon among themselves and would rely instead upon the superstrate/substrate pidgin to serve this function.

7.5.2.1 Challenge The first prong of the challenge simply questions the logic behind these two assumptions. Since substrate speakers were perfectly able to establish a pidgin between their primary languages and the superstrate, why wouldn't they do the same thing in establishing a communication bridge between substrates? Why should they need to adapt the more limited pidgin between the superstrate and substrate for this very different purpose? These mutually unintelligible language groups would have been in contact with each other as long as they were in contact with the superstrate speakers, so why couldn't establishment of communication among them

be immediate (i.e., concurrent with the establishment of the superstrate/substrate pidgin)?

In response to this challenge, Michel DeGraff (personal communication), referring to work by, among other, Alleyne, Chaudenson, and Mufwene, has pointed out that population ratios and the contact and learning conditions at different sociohistorical stages need to be taken into account (see Mufwene, this volume). Per such account, the seeds of pidginization/creolization in the Caribbean case might have been planted in the context of "société d'habitation" (a homestead-type society; as opposed to "société de plantation" (plantation-type society)), when Africans were in the numerical minority and had plenty of opportunity to acquire an adult-L2 (second language) version of the superstrate (see Mufwene, this volume). Thus, exposure to the superstrate would be substantial at this early stage, and a core set of substrate speakers would have the superstrate language as a second language. Presumably, there was not at that point sufficient *critical mass* for a peer-group pidgin to arise among the transplanted Africans (see Mufwene, this volume),[49] assuming that critical mass was subsequently achieved when the African population exceeded the European population. Substrate transfer at this point would occur as in other case of imperfect bilingualism with fossilized transfers (see Grosjean 1982).

We would not consider this L2 version of the superstrate to constitute an asymmetric pidgin. The substrate speakers at this point would be bilinguals. However, at the subsequent point when the conditions for pidginization were met, this scenario entails that some of the pidgin varieties were actually approximations of the superstrate (à la Chaudenson). Thus, under our model, where both a symmetric and an asymmetric pidgin coexist, the asymmetric pidgin would be a continuum that at one end actually approximated the superstrate. Furthermore, this heavily superstrate-influenced, asymmetric pidgin would be in contact with the heavily substrate-influenced peer-group/symmetric pidgin. Given the diverse contexts of creolization, it is difficult to precisely determine the respective contributions of the asymmetric and peer-group pidgins to the emerging creole. If the société d'habitation stage were invariant across creoles, it would ensure that the superstrate language was a source for both the acrolectal *and* basilectal contact varieties, offering speakers of the substrate languages more direct and substantive access to the superstrate language than most models of creolization currently recognize. Furthermore, if the société d'habitation stage were a necessary component of creole genesis, the Nicaraguan situation would diverge significantly from the creole model. If it were not, the Nicaraguan case could provide a "cleaner" language-emergence case study where the widespread influence of the superstrate on the contact-induced pidgin varieties as a result of early bilingualism was not a factor.

7.5.2.2 PSN versus LSN   If we have indeed been watching the genesis of a signed language creole in Nicaragua, our observations and documentation over the last thirteen years may constitute one of the only documented cases of the early stages of a creole, and perhaps our data can shed some light on the validity of previous speculation.[50] This case offers an additional source of evidence, unavailable to prior

studies. The superstrate (Spanish) doesn't just differ from the substrates (homesign systems) on the basis of typological linguistic features; it differs in modality as well. The superstrate is spoken, whereas the substrates are signed. We can exploit this modality difference to directly test the hypothesis that two pidgins co-occur.

As we showed earlier, the superstrate/substrate pidgin (PSN) involves both signing and speaking. The symmetric pidgin/jargon (LSN) serving as a peer-group contact language for substrate speakers is typically not spoken at all. If PSN had been recruited to serve as the pidgin among substrate homesigners, then the pidgin between them should exhibit the interspersing of the speech and sign modalities we see in PSN. It does not. As well, it should be relatively understandable to hearing PSN signers. It is not. Even as far back as 1986, hearing PSN users expressed to us an inability to understand the signs used between LSN signers—even most of the individual lexical items. The emergence of LSN seems to have paralleled PSN but not to have been seeded from it. And, while PSN plods along, LSN is dynamic and constantly increasing in grammatical conventionality and complexity. But, to assume LSN is an expansion of PSN invokes an unmotivated and unnecessary step. Why would a group of deaf peers speaking mutually unintelligible homesign systems recruit a limited-use spoken/signed pidgin to serve their communication needs? Why wouldn't a pidgin arise directly between these deaf signers? If PSN seeded LSN, then it remains to be explained why LSN signing is so different—so much richer (not to mention quieter) than PSN signing.

Kegl and Iwata (1989), extrapolating from their direct observations of the Nicaraguan situation, suggested that on the slave plantations not one but two contact languages could also easily have coexisted. One would have served as a communication bridge between the superstrate and substrate speakers (a pidgin in the classical sense). The other would have served as a contract language among a diverse population of substrate speakers in a symmetric power relation to each other (the classic environment in which a jargon or expanded pidgin arises).

Under the Kegl and Iwata (1989) model, because substrate speakers use both language varieties, we would expect borrowings from one to the other. Since the symmetric pidgin/jargon has broader functional power, we can see how it would borrow from the superstrate/substrate pidgin but retain much of its substrate influence. However, given the initial role of some bilingual L2 speakers of the superstrate within the group of substrate speakers (as discussed by Alleyne, Chaudenson, Mufwene, etc.), influence from the superstrate could be greatly increased (see Mufwene, this volume). Although modality alternations help us tease apart the comingling of the superstrate/substrate pidgin (PSN) and the peer group pidgin (LSN), the differentiation in the unimodal plantation model is more difficult.

7.5.2.3 Arguments for Coexisting Symmetric and Asymmetric Pidgins

Bickerton (personal communication) reconfirmed his contention that only the asymmetric pidgin plays a role in the plantation model. He explicitly stated that the symmetric pidgin/jargon between substrate languages would be impossible to find, because he is sure none existed, even in Hawaiian Creole English, where he has both

written records and interviews with still-living speakers of the antecedent pidgin who immigrated before 1930.

However, Holm (1986, 1989; 517–526) and Goodman (1985) challenge Bickerton's (Bickerton and Odo 1976) analysis of the Hawaiian case. They cite Reinecke (1969, 34–35) to argue that Bickerton has not sufficiently "ruled out any continuity between contemporary Hawaiian creole English and the *hapa haole* of the early plantation period before" (Goodman 1985, 112). Holm (1988, 522) argues that Bickerton has not examined the "relevant pidgin." *Hapa haole* (existing in the first half of the nineteenth century) is considered to be part of South Seas Jargon based largely on English but mixed with words from a variety of other languages (Clark 1979). It was the kind of language likely to be learned by Hawaiians sailing on American whaling ships. Clark (1979) provides numerous convincing examples of shared lexicon and characteristics, including *been* as an anterior or past-tense marker, *by and by* as a future marker, *piccaninny* 'child', *plenty* 'much, many', *savvy* 'know', *suppose* 'if', *too much* 'very, very much'—all found in Atlantic varieties of Creole English and Hawaiian Creole English. *Hapa haole* should have exhibited the characteristics of a symmetric pidgin/jargon. Roberts (1998) presents new evidence countering this challenge.

Independent of the outcome of the debate between Bickerton on the one hand and Holm and Goodman on the other, there is sufficient reason to suspect that a symmetric pidgin (with prior or, equally plausibly, contemporary origins) may have coexisted alongside the standardly recognized asymmetric pidgin. And despite explicit evidence of a *distinct* prior pidgin, Bickerton's current data are still taken to support "a structureless, macaronic mish-mash of half-a-dozen languages, with Hawaiian predominating at the earlier date and yielding only gradually to English" (Bickerton 1992, 101). The evidence Bickerton collected via court records (likely documenting only the asymmetric pidgin) and testing of pre-1930 immigrants, whose removal from the labor force as a consequence of the Great Depression meant that the environment for using the pidgin hadn't existed for them for almost half a century before being tested, cannot be used to rule out the possible coexistence of a symmetric pidgin on the sugar plantations.

This challenge to Bickerton not only rebuts Bickerton's dismissal of Kegl and Iwata's (1989) proposal that an asymmetric and symmetric pidgin coexisted in the Nicaraguan case, it opens the possibility that a symmetric pidgin could have co-occurred in the history of other creoles as well. Direct evidence for the two-pidgin hypothesis in the Nicaraguan data suggests that such a scenario offers a viable hypothesis.

The close interdependency and feeding relation between the two contact languages co-occurring in the plantation environment obscures their independent existence. Yet, models of pidginization and creolization that consistently require both the social asymmetry resulting from colonization and the mutual unintelligibility of substrate languages, necessitating a pidgin for peer-group communication, implicitly recognize the coexistence of these two pidgin types as the defining feature of a plantation creole.

Sankoff (1979) claims that, although many sorts of language contacts may occur, "we know of no cases where a 'pidgin' has developed in conditions other than those

of modern European colonial expansion." It is crucial to her view of pidgin-creole genesis that there be a "catastrophic break in linguistic tradition," creating a situation where no one has access to a native language for purposes of communication with the rest of the community.

It is difficult to conceive of another situation where people arrived with such a variety of native languages; where they were so cut off from their native language groups; where the size of no one language group was sufficient to insure its survival; where no second language was shared by enough people to serve as a useful vehicle of intercommunication; and where the legitimate language (Bourdieu and Boltanski 1975) was inaccessible to almost everyone. (Sankoff 1979, 24)

Sankoff's quote encapsulates both the "language begets language" assumption and the implicit recognition of the indispensable role of a symmetric pidgin in the creolization model. By bringing the Nicaraguan case into the pidgin/creole forum, we challenge creolists to (a) rethink the "language begets language" assumption, (b) make explicit the implicit assumption that the pressure for a symmetrical pidgin among the substrates is an important piece of the plantation model, and (c) consider the heretofore "inconceivable" notion that creolization of a language, not only outside of the context of European colonial expansion, but in a modality other than the spoken languages studied to date, may, by virtue of having creolized before our very eyes, provide evidence having a direct impact on theories and models of pidginization and creolization.

Under the Kegl and Iwata (1989) proposal, the asymmetric pidgin plays a minor role in the emergence of a creole by affecting to varying degrees the influence of both the superstrate and substrate languages on the symmetric pidgin. Because substrate speakers have both pidgins[51] in their repertoire, they provide the conduit enabling the peer-group pidgin to be modulated by influences from the many inputs to the asymmetric pidgin. The convergence of borrowing from adstrate languages, internal innovation within the peer-group pidgin/jargon, and first-language acquisition play a much more central role in the emergence of a creole.

7.5.3 Assumption: Abrupt Creolization Can Circumvent a Pidgin Stage Altogether

Some accounts of creolization require a creole to have a pidgin in its history, whereas others do not. Mühlhäusler (1986) describes numerous instances where creoles arise from trade jargons rather than pidgins—Pidgin Macassarese in Northern Australia, Arabic Chinese Pidgin, and Pidgin Siassi of New Guinea. Holm (1988) points out that if Caribbean and other creoles grew out of nativized varieties of unstable pre-pidgin jargons, then the classical definition of a creole as "any language with a pidgin in its ancestry" is technically wrong. In these instances, we might expect much less accommodation of jargon speakers to a superstrate languages. In fact, there may be no superstrate.

7.5.3.1   Abrupt Creolization   Up to this point we have stated our alternative "two-pidgin" model as a variant of the standard plantation-creole models that Thomason and Kaufman (1988, 149) termed the "pidgin-to-creole" models. Such models either

require slaves to come to the plantation knowing a preexisting pidgin (a version of the monogenesis model) or require a period of time where the asymmetric pidgin that arises then stabilizes or crystallizes (Weinreich 1953) so that it can be learned as a second language. Under these models, a certain degree of conventionalization needs to take place within the language pool so that speakers can learn it as a language (Sankoff 1980). This process of conventionalization is assumed to take time, and during this time, most slaves had available to them their first languages to use to communicate with at least some subset of their substrate-speaking peers.

However, in some cases (see Alleyne 1971; Chaudenson 1977), slaves were completely linguistically isolated from other speakers of their native language. In other words, they came to the plantation with a primary language but without anyone to use it with. Thomason and Kaufman (1988), in their chapter on "abrupt creolization," focus on these sorts of conditions, which characterize Isle de France Creole (Baker 1984; Baker and Corne 1982) as well as some of the Caribbean creoles:

But in the uprooted and mixed speech communities of slaves, a person might have few or no people to talk to in his or her native language. Such a person would need a primary language for communicating with his or her fellows, not merely a second language to use for limited purposes of intergroup communication. (Thomason and Kaufman 1988, 149)

They argue that the creolization process in this situation may be greatly accelerated, bypassing the stabilized-pidgin stage altogether. Because the emerging contact language immediately becomes the primary language of the community and is learned as a first language by any children born into the new multilingual community, Thomason and Kaufman (1988, 150) further argue that the products of this process of "abrupt creolization" correspond to what Bickerton calls "early creolized creoles." Bickerton takes the most extreme position[52] in terms of minimizing the long-term contribution of substrate languages to creoles by allowing the Bioprogram and its unmarked settings to completely usurp their influence.

... if one subtracts from a creole grammar all those properties which it has derived from the superstrate, then what is left are properties derived from the set of unmarked settings. (Bickerton 1984, 7)

Bickerton denies substrate influence. Thomason and Kaufman, while disagreeing with his rejection of the influence of the primary languages and pre-pidgin of the first generation substrate speakers on the creolization process, deny any genetic continuity whatsoever:

... we do not believe that an abrupt creole can reasonably be viewed as a changed language form of its vocabulary-base language; there is, in fact, no language that has changed. Instead, an entirely new language—without genetic affiliation—is created by the first members of the new multilingual community, and further developed and stabilized by later members, both children born into the community and (in many or most cases) newcomers brought in from outside. (Thomason and Kaufman 1988, 163)

They argue that once abrupt creolization has occurred, a process of ordinary contact-induced language change accounts for the extent to which this newly emergent language shifts over time in the direction of the superstrate. Where the superstrate is

available and acquired by the shifting group, change will be in the direction of the superstrate. Where it is not, the newly emergent language can actually become and remain the target language of the community.

7.5.3.2 A Slight Revision: The Nicaraguan Case

The abrupt-creolization scenario fits well with what we have observed in Nicaragua. It recognizes the need for a communication form between substrate speakers (what we have referred to as the symmetric pidgin/jargon) as the primary catalyst to creolization. It recognizes the role of first-language acquisition in this rapid process, while still recognizing that aspects of the pre-pidgin can influence the creolization process. And, it downplays the role of a superstrate in the initial process, leaving its participation to later language-contact phenomena.

Actually, Thomason and Kaufman (1988, 163) "fail to see how the adults' pre-pidgin *and native languages* [their emphasis] could fail to influence the emerging creole directly, even if we grant a special role to the children in its development." We agree that it is the pre-pidgin that serves as the input to the first-language acquirers who immediately creolize it. However, we would refine Thomason and Kaufman's model slightly in noting that, although the native languages of substrate speakers would, if present, also serve as input to the creolization process, they are not a necessary precondition to creolization. In the Nicaraguan situation, the pre-pidgin recognized here would correspond to what we are calling early LSN (the symmetric pidgin/jargon). As we have shown, there were no available substrate "languages" to serve as input to LSN. Early LSN was an outgrowth of the conventionalization that occurred among a critical mass of homesigners, none with mastery of a prior signed language. It required the direct contribution of innate language capacities in its creolization to ISN.

7.5.3.3 The Stabilization of LSN

Upon creolization, the pre-pidgin LSN did not disappear, however. In fact, that first generation of LSN signers are only in their late 20s and 30s today. Whereas the first incarnation of LSN that occurred between homesigners only was transient, LSN in an ever-changing form (influenced now by ISN, PSN, and Spanish) has remained in the repertoire of not only the first generation of late-learners but has become the communication form for subsequent generations of late learners who have entered the Deaf community. As a result, LSN has remained and has crystallized/stabilized.

Signed languages are unique in that the majority of their speakers are born to speakers of unrelated languages in another modality.[53] In Nicaragua, this is true in 100% of the cases. Only children of hearing parents who become immersed in the Deaf community early (<7 years of age) acquire ISN. Those who enter later (8–14 or so) acquire LSN to varying degrees. And, those who miss the critical period for language acquisition (>15) do not acquire a signed language at native levels of fluency at all. Late-learners who enter now are only mastering ISN partially, acquiring LSN (which in all cases involves variability), or, as we suspect, doing both. It remains to be

seen if LSN will fade away with the first generation of LSN signers, leaving behind only late learners of ISN.

One might argue that what we are calling LSN is actually the early creolized form of the language and that what we call ISN is the stabilized creole. Our quantitative studies argue against this. While creolization did occur with the Deaf schoolchildren who were 7 or younger in that first generation of homesigners who entered school in the late 1970s, the abrupt grammatical changes characteristic of ISN are not found in older signers who entered the schools at the same time. Thus, at best both processes co-occurred, with LSN influencing the nature of ISN. Our results, indicating the increasing richness of both LSN and ISN over time, attest to the fact that both of these language forms underwent their own subsequent processes of stabilization.

In essence, the Kegl and Iwata (1989) model turns out to be only a variant of the abrupt-creolization model of Thomason and Kaufman (1988). But, the Nicaraguan case does offer unique and strong support for their model, while simultaneously supporting Bickerton's emphasis on the primary role of first-language acquisition in this process.

7.5.4 Assumption: Grammatical Characteristics of Pidgins and Creoles are Universal

The inclusion of pidgin and creole sign languages as an additional source of evidence in pidgin and creole studies certainly forces us to move away from the strictest definition, which assumes European colonial expansion and a plantation model. Furthermore, because of modality differences, the grammatical hallmarks of creolization may also be expected to express themselves differently.

Bickerton (1981), for example, proposed a set of grammatical characteristic that are shared across creoles, not because of monogenesis from some shared pidgin, but as a result of the fact that creolization expresses the unmarked tendencies of the human bioprogram for language. Not even a subset of his proposed constellation of creole characteristic has been shown to invariably occur across the world's spoken creoles. Yet, creolists carry expectations that creoles will exhibit at least a reasonable subset of these unmarked grammatical properties. However, the existing inventory of creole characteristics was developed in the context of the study of spoken creoles and indices of markedness in spoken languages. The markedness conditions, or grammatical tendencies of human language in a different modality, have yet to be taken into account.

7.5.4.1 The Challenge

Although the information amassed thus far on the typological characteristics of signed languages shows that they exhibit the grammatical properties and constraints that universally characterize natural human languages, their modality of expression seems to dictate a different metric of markedness than we find for spoken languages. For example, signed languages have larger, heavier, and slower moving articulators (the arms as opposed to the tongue). They have the potential for multiple channels for encoding grammatical information. The face, head, torso, eyes, and the various joints of the two arms can realize morphemically

distinct information simultaneously. The visual system, which is the typical modality for reception, is not suited to the same rapid linear processing that the auditory system can handle (Poizner and Tallal 1987). As a consequence, signed languages favor packing more information into a single sign (more agglutinative morphology, with the potential for this morphology to be simultaneously realized, or nested). The demands of the modality override many of the spoken-creole generalizations, particularly those favoring isolating morphology.

This does not mean that such grammatical characteristics cannot occur; rather, they are not unmarked in Jakobson's (1968) sense. Isolating morphology, for example, is found regularly in alternate sign languages/systems (signed languages developed by people already competent in some spoken language; see Kendon 1988b, 4) such as various sign languages of aboriginal Australia (Kendon 1988b), Plains Indian Sign Language (Kegl and White Eagle 1986), Cistercian Sign Language (Barakat 1975), Pidgin Sign English,[54] among others, as well as artificially invented manually coded languages/systems such as the variety of forms of Manually Coded English used in education in the U.S., where a word- or morpheme-to-sign correspondence is established for the production of "English on the hands" (see Wilbur 1987; S. Supalla 1986). However, isolating morphology is a marked feature of primary signed languages. Gee and Goodhart (1988) point out that subject and object inflection is not typically listed among the expected properties of spoken pidgins or even creoles, but the full incorporation of subject and object markers into the movement of verbs is a characteristic of every primary signed language and signed creole. For signed languages, this is one feature that the innate capacity for language consistently fills in early on.

7.5.5   Assumption: Serial Verb Constructions Confirm African Substrate Influence

There has been considerable debate between proponents of the Language Bioprogram Hypothesis and the African Substratum Hypothesis. Proponents of these hypotheses have polarized their positions in such a way that they are debating peripheral details rather than considering the positive consequences that a hybrid analysis may offer. This polarization follows primarily from the strong position that Bickerton has taken regarding the role innate language capacities play in creolization—a position that fails to recognize the influence that substrate languages can (but not, as we have shown, *must*) have on the eventual creole. Just as Bickerton uses unmarked grammatical characteristics to support the Languages Bioprogram Hypothesis, supporters of the African Substratum Hypothesis use the existence of marked grammatical characteristics as evidence of the role substrate languages play in determining the ultimate typological characteristics of an emergent creole. We will examine one of these arguments here.

Nylander (1986) used serial verbs as an argument against the Language Bioprogram Hypothesis of Bickerton (1981, 1984) and in favor of the African Substratum Hypothesis. For Nylander, the sheer appearance of serial verb constructions (SVCs) in creole languages argues against the Languages Bioprogram Hypothesis. Hopper

(1985, 74) characterized SVCs as "multi-verb propositions whose arguments are distributed singly over the verbs." Beyond this broad characterization, there is a surprising lack of agreement on exactly what criteria characterize this class of constructions (Bradshaw 1982; Filbeck 1975; Jansen, Koopman, and Muysken 1978; Schiller 1990; Sebba 1987; Seuren 1990). Most recognize that the multiple verbs in an SVC refer to a single event, that they tend to form a single prosodic unit, and that at least one argument is shared by multiple predicates.[55] Many further adhere to the Same Subject Constraint, which requires the subject of each verb in an SVC to be the same (Sereechareonsatit 1984; Foley and Olsen 1985; etc.). Others further require that only one of these subjects be overt (Jansen, Koopman, and Muysken 1978). Schiller (1990) presents data from Khmer, Sakao, Paamese, and Sranan that speak against the Same Subject Constraint on SVCs.

Nylander adhering to the Same Subject Constraint definition of serial verbs, appeals to the fact that SVCs are attested in very few language families and are therefore marked structures in the Jakobsonian sense (see Jansen, Koopman, and Muysken 1978). However, if we accept Jakobson's correlation of markedness with those aspects of language acquired first, then surely single-valence verbs would be unmarked. Children certainly begin with few words in a sentence (one-word stage, two-word stage); they also exhibit early on a valency of one argument per verb. We might expect developing languages (pidgins or creoles) to exhibit similar predispositions, thus favoring SVCs qua "multi-verb propositions whose arguments are distributed singly over the verbs."

7.5.5.1 The Challenge Our data show that SVCs can and do arise in the course of language emergence, independent of African substrate influence—both LSN and ISN have sequences of single-valence verbs. We will argue that SVCs arise as a consequence of the argument valency limitations of pidgins, especially those without full-language substrates as input. Our point here is not that SVCs are necessarily unmarked; rather, that a reliance in pidgins and pre-pidgins on single-valence verbs leads naturally to the use of sequences of clauses involving single-valence verbs. These verb-sequencing constructions beg for reanalysis in the creole as SVCs. Therefore, it is not unreasonable to imagine that an implicational universal could exist that notes a tendency for recently emerged creoles to have SVCs.

7.5.6 Serial Verb Constructions

We now turn to an interesting set of data concerning the emergence of SVCs in Nicaraguan Sign Language that at least points to the possibility that SVCs can be a natural concomitant of language emergence and not only the result of substrate influence, as is assumed in much of the creole literature. We came upon these serial-verb data quite by accident in the context of a sentence-production experiment. Kegl (in preparation) has since reviewed the relevant video corpus and documented the prevalence of SVCs in Nicaraguan Sign Language, confirming that the SVCs are not simply an artifact of the stimuli used. However, here we present only the data elicited in the course of pilot studies preliminary to the sentence-production experiment.

7.5.6.1   A Sentence-Production Study   In a pilot study, 44 sentences were elicited from six Nicaraguan signers (two LSN signers and four ISN signers)[56] by presenting line drawings depicting a boy and girl engaging in various events that were expected to elicit transitive and ditransitive verbs. These stimuli were actually the response stimuli that correspond to the Sign Order Comprehension component of the Supalla et al. (1990) ASL Test Battery.[57] The stimuli each consisted of two pictures on a page depicting the same event—one with a boy as the agent and a girl as the patient, and the other with these roles reversed. The events involved actions requiring multiple argument-taking verbs: giving, approaching, showing, asking a question of, scolding, loving, looking at, hitting, pushing, touching, yelling at, insulting, and bowing to.

Each subject was given a series of pages with two pictures, each depicting the same event and where the boy and girl's roles were reversed in the second picture. The first three subjects tested (two LSN signers and one ISN signer) produced sentences corresponding to each picture on the page (88 sentences in all). In each case, the receiver was an LSN signer. With the last three subjects, one picture was marked with an X indicating the event to sign (44 sentences in all). A second signer (in each case, an ISN signer) was asked to view the sentence without knowing which of the two choices had been indicated and on a similar page (unmarked) to choose which picture the sentence described. The receiver served as a check on the subject's accuracy in conveying the information. Only those 44 utterances produced by all the subjects form the basis of this study.

Each sentence produced was transcribed.[58] We first identified when multiple verbs were being used to encode a single event. These could be simply concatenated verbs used to characterize a single event or SVCs. In the course of transcribing, we looked for syntactic evidence that would distinguish multiple verb utterances from a sequence of two distinct utterances. The best test comes from the occurrence of Topics.

Most serial verbs we observed were switch-subject serial constructions "where the object of a preceding verb becomes the subject of a following verb, with cause and result semantics" (Bradshaw 1993, 149). An example from Numbami, an Oceanic language reported by Bradshaw appears in (8), with a slightly modified gloss. Notice that *paper* is the object of the first verb and the subject of the next two.[59]

(8) Na-so   pepa ni-wesa ni-ndenga nanggi   lunggewe.
    IR1s-stab(write on) paper IR3s-go IR3s-reach GEN1s-sister far-away [IR = irrealis]
    'I'll write a letter to my sister (far away).'

7.5.6.2   Results   We will first report the types of verb sequences observed from the transcripts of the signed responses of the six signers studied. We then move on to quantitative results on the three of those signers who all entered the school in 1977, the earliest possible year for entry. While year of entry is kept constant, the signers vary in terms of age at entry (ages 4, 7, and 9).

Under these experimental conditions, the LSN signers did not produce verbs that license both an overt subject and object NP in pre- and postverbal argument positions.[60] That is, we do not see sentences of the form:[61]

(9) *WOMAN PUSH MAN (NP V NP)
    'The woman pushed the man.'

For LSN signers, verbs, even those that are inherently transitive or ditransitive, tend to only allow a valency of one argument. However, SVCs are used to combine multiple verbs to encode more complex conceptual structures. In these constructions, an extra argument is often added to an utterance by allowing it to serve as the subject of a subsequent, adjacent verb. Typically, the primary meaning is expressed by the first verb,[62] whereas the second verb tends to express a result or termination of the event as in (10a). The second verb in each NP V NP V construction in 10a–d is added to support a second argument (i.e., MAN) that is associated with the verb PUSH. The intended meaning conveyed in each case is still 'The woman pushed the man.'

(10) a. WOMAN PUSH MAN GET-PUSHED
        'The woman pushed the man.'
        [lit. 'The woman pushed the man (man) got pushed']
     b. WOMAN PUSH MAN REACT
        [lit. 'The woman pushed the man (man) reacted']
     c. WOMAN PUSH MAN FALL
        [lit. 'The woman pushed the man (man) fell']
     d. WOMAN PUSH MAN CRY
        [lit. 'The woman pushed the man (man) cried']

The second verb in (10a) does not exhibit passive morphology. Instead, in the verb GET-PUSHED, the "pushee," as opposed to the "pusher," is marked with first person point of view. In (10a), PUSH is articulated from the perspective of the "pusher" (WOMAN)—the signer's full body extends two hands outward in a pushing gesture. However, for GET-PUSHED, the signer's body jolts backwards as if having received the thrust of a push by some unspecified agent.[63] These articulation differences mark different thematic arguments as role prominent in the two verbs. In PUSH, agent/source is role prominent, and in GET-PUSHED, patient/goal is role prominent. Although use of the signer's body may appear mime-like in these examples, it serves very different roles in Mimicas (mime-like), LSN (more conventionalized, systematically instantiating a second thematic role), and in ISN (clearly grammaticized morphologically to mark role prominence). In the second slot of double-verb constructions in LSN, psychological verbs and verbs that semantically take a second argument obligatorily mark the subject with first-person point of view. Subjects of other intransitives (e.g., activity verbs or unaccusatives like FALL) optionally mark their subjects in this way. In ISN, the same dichotomy is preserved, but the option of placing first-person point of view on the latter forms is reserved only for highly marked, extrasentential, role-play situations.[64]

Some signers favor a more neutral second verb like REACT to mark this termination across a wide class of verbs as in (10b). A similar neutral verb POSE (signer strikes a pose, usually similar to one depicted) marks addition of the object of psychological verbs like SEE, LOVE, and so forth. We are currently exploring whether any of these more general markers have emerged as a completive aspect[65] or ethical

dative marker in ISN. An extra verb, whose action is not depicted in the stimulus pictures, is often added in order to support the second argument as in (10c,d). Such a verb does not conflict with the depiction of the event, but it does add superfluous information that goes beyond what is conveyed in the picture—typically, contriving a possible subsequent reaction.

Similar valency effects, involving the inclusion of additional predicates to support extra arguments, have been observed in ASL when signers are asked to sign a *single* sentence introducing three distinct NP arguments. New arguments are often introduced as Topics and there are at most two Topics allowed per sentence. As a result, a request for a sentence comparable to "Each of *the students* gave *the teacher a box*"[66] yielded two clauses, one of which introduced a new predicate (SURPRISED) to support the third argument:[67]

(11) top   top
      BOX   STUDENT-EACH [distributive]$_{i,j,k}$ RP$_{1st p.\neq i,j,k}$GIFT-TO$_{1st.p(neutral)}$.
      box-topic   [student each-of-many]-topic   role-prominence = (1st per./
                                                       unspecified)$\neq$
                                                       subj. = (distributed plural)-give-a-gift-
                                                          to-obj = (1st per./unspecified)

      TEACHER SURPRISED
      teacher   surprised (adj.pass.)
      'Each of the students gave the teacher a gift.'
      [lit. Each of the students gave a gift to the teacher (teacher) was surprised.]

Topic constructions, such as example (11) from ASL, occur in LSN and ISN as well and provide evidence that the SVC is a multiple-verb utterance rather than a sequence of two distinct utterances. The argument of the second verb can appear in Topic position preceding the entire SVC. The subject of the second verb can be overt or null: TOP$_i$ NP V (NP$_i$) V.

(12) MAN, WOMAN PUSH (MAN) GET-PUSHED
     'The woman pushed the man.'

It is also possible to have a topic corresponding to the entire second VP.

(13) a. MAN GET-PUSHED, WOMAN PUSH ((MAN) GET-PUSHED)
        'The woman pushed the man.'
     b. WOMAN REACT, MAN KICK IX(girl) POSE-OUCH
        'The man kicked the woman.'
     c. WOMAN POSE, MAN BOW BOW WOMAN POSE
        'The man bowed to the woman.'

Both NP topics and VP topics are more commonly produced by ISN than by LSN signers. The "topic test" provides direct evidence that certain multiple-verb sequences in LSN and ISN are indeed SVCs. Although LSN signers produce many multiple-verb sequences that could be analyzed as either sequences of single-valence verbs or SVCs, very few certifiable[68] SVCs are produced. It is always possible, however, that

many of these sequences of single-valence verbs are actually SVCs, but that topicalization is far less frequent in LSN.

ISN signers produce many SVCs, but in some instances where LSN signers would only use a SVC, ISN signers have begun to drop the second verb entirely as in:

(14) MAN, WOMAN PUSH (Top$_i$, NP$_j$ V [e$_i$])
    'The woman pushed the man.'

This suggests the emergence of double-valence verbs. But, the crucial example that the sentence indeed tolerates two full NPs within the same clause would be one where a second NP occurs in object position such as NP V NP.

In a second-generation ISN signer, such as Santos (age 7 at testing), who was exposed to the ISN signing of his aunt and uncle from birth and who entered school at a very young age, we see fully grammaticized transitive verbs without any topicalization, as in the form mentioned earlier as unattested in LSN signers:

(15) WOMAN PUSH MAN (NP V NP)
    'The woman pushed the man.'

These constructions undeniably involve double-valence verbs. The transition from LSN to ISN is signaled by the emergence of double-valence verbs but not by the loss of SVCs. We don't yet know if the emergence of double-valence verbs occurs immediately or requires a period of stabilization.

7.5.6.3   Quantitative Results   We will now examine three subjects quantitatively. All three entered the schools in 1977, the earliest possible class. But, they entered at three different ages: 4, 7, and 9. Testing was in 1993. Figure 7.2 presents a comparison between two Deaf females, both of whom entered school at the earliest possible date, 1977. Although these signers report that they did not sign at that time, they were also in the first large classes of Deaf students when the school truly became publicly accessible in 1980. Both of these women are currently fully enculturated, active adult members of the Deaf community. Both have Deaf spouses, and each has one hearing child. They differ in only one respect—one entered the school at age 9,[69] whereas the other entered at age 4. These subjects were chosen based on same year of entry and their varying ages, but for purposes of exposition, we will refer to the one who was 4 at year of entry as an ISN signer and the one who was 9 at year of entry as an LSN signer.[70]

The use of multiple verbs to describe single events is strongly represented in both signers, but we see a difference in the occurrence of constructions involving second object topics—the litmus test that these are indeed SVCs. Only 3% of the LSN signer's sentences are certifiable SVCs, whereas this is true of 30% of the ISN signer's sentences. We have broken down the type of SVCs produced into those that are not distinguishable from sequences of single-valence verbs, except by their semantics (NP V NP V), those that have a second subject topic with two verbs and all arguments overt (Top$_i$ NP V NP$_i$ V), those in which the second NP subject is null (Top$_i$ NP V $\varnothing_i$ V), and those with two NPs and a single verb, all of which involved topics (Top$_i$ NP V $\varnothing_i$).

PERCENT OF SERIAL VERB TYPES PRODUCED BY TWO SIGNERS
DIFFERING IN AGE (9 VS. 4) AT SAME YEAR OF ENTRY

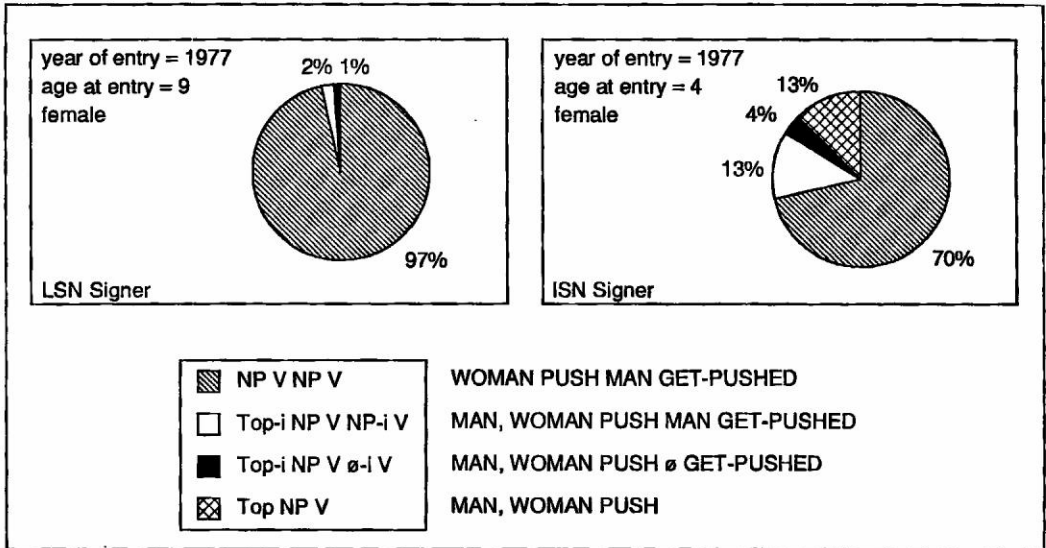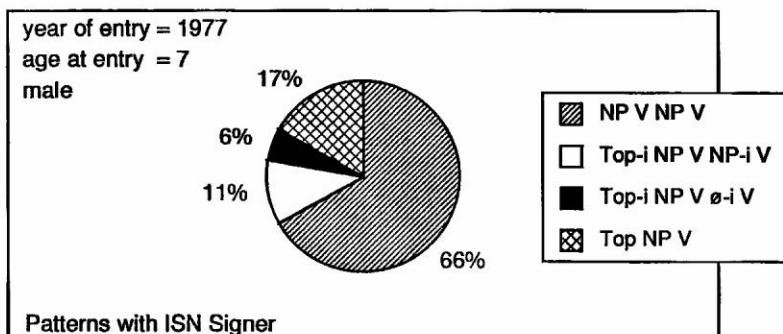|		
▨ NP V NP V	WOMAN PUSH MAN GET-PUSHED	
☐ Top-i NP V NP-i V	MAN, WOMAN PUSH MAN GET-PUSHED	
■ Top-i NP V ø-i V	MAN, WOMAN PUSH ø GET-PUSHED	
▩ Top NP V	MAN, WOMAN PUSH	

Figure 7.2
This figure provides a direct comparison of serial verb constructions (SVCs) produced by two female signers who both entered school with the first classes of deaf children and therefore have been signing for the same length of time. All potential SVCs are represented including NP V NP V sequences that cannot be definitively distinguished from non-SVC sequences. The signer who entered at age 9 produces only single-valence verbs, with little indication that the verb sequences are more than strung together in sequence. The signer who entered at age 4, via topic marking on the argument of the second verb in the conjunct, shows that these sequences form a single grammatical construction. Furthermore, the ability to produce two arguments with a single verb in 13% of her utterances signals the emergence of multiple-valence verbs in this signer.

The LSN signer produces none of the Top NP V constructions, but the ISN signer produces them in 13% of her responses. These constructions may mark the first oc-currence of double-valence verbs. However, they may not be instances of two fully expressed NP arguments. They could be analyzed as a base-generated topic followed by a verb that takes a null object.

We argue that the critical period for native first-language acquisition of input falls somewhere between these two signers. In our initial set of subjects, we had a male signer who also entered in 1977 but at 6–7 years of age. This signer is also fully enculturated into the Deaf community and has a Deaf spouse. As seen in comparing figure 7.3 with figure 7.2, he patterns most closely with the ISN signer. This signer produces certifiable SVCs 34% of the time. And, he produces the Top NP V con-struction 17% of the time.[71] The emergence of this Top NP V construction in con-junction with a significant increase in spatial agreement, which we know to include person agreement with both subject and object, suggests that at least some Top NP V

PERCENT OF SERIAL VERB TYPES PRODUCED BY
ANOTHER SIGNER AGE 7 AT SAME YEAR OF ENTRY

Figure 7.3
The profile of serial verb constructions used by a 6–7-year-old male signer, who also entered school in 1977 and has been signing for the same amount of time, patterns with the ISN signer, suggesting that, at least in his case, some level of native-like language acquisition is possible up to age 7.

constructions involve double-valence verbs, possibly with moved rather than base-generated topics. If the emergence of double-valence verbs is an indicator of the shift from LSN to ISN, then this places the ability to learn ISN as a first language at somewhere below 7 years of age at entry. Late learners (8–14 years of age at entry) still acquire the language, just not natively.

Despite the fact that these signers were all tested in 1993, 16 years after their earliest possible contact with other signers and with over a decade of exposure to ISN signers, differences between the LSN signer and the two ISN signers still remain. In fact, with the exception of 3% of the sentences produced, the LSN signer doesn't show any clear-cut evidence of producing certifiable SVCs. However, in the six signers coded, we only found the NP V NP construction in the ISN signer that entered the Deaf community much later, in 1985. This was also the youngest signer to enter the Deaf community. Santos was the nephew of the male ISN signer whose data are reported in figure 7.3, and his uncle was the receiver in this testing session. The claim that ISN needs time to stabilize may be suggested by this. It is also possible, as is the case with Santos, that exposure from birth (or at least from a much younger age) has an even greater impact on native mastery of the language. We have not examined enough cases to verify or deny this. This experiment is only a pilot study; many more subjects need to be tested before drawing any final conclusions.

The use of single-valence verbs seems to be a natural stage in the emergence of serial verbs and in the emergence of transitivity in language. Single-valence verbs circumvent the need to use syntactic means of identifying grammatical relations. They are an expected grammatical characteristic of early stages in the emergence of a language and may be expected in spoken-language pidgins as well. However, the events expressed by pidgin speakers are not limited to those involving a single

participant role. Sequences of clauses taking a single NP argument, one option in the UG inventory, provide an obvious solution to the tension between the complexity of concepts to be expressed and the restrictions on the pidgin grammar used to express them. SVCs seem the logical next step in the grammaticization of these clause sequences. This does not make them any less a characteristic of fully articulated languages. What can also be seen in figures 7.2 and 7.3 is that even after the emergence of double-valence verbs, SVCs still occur with a relatively high frequency.

The Nicaraguan data do not argue against the African Substratum Hypothesis, but they do provide the control condition where substrate influence is brought to zero and serial verbs still emerge, countering the claim that SVCs are marked in creoles as well as the claim that SVCs must come from substrates with SVCs. These data weaken Nylander's (1986) arguments against a weak form of Bickerton's claim—that first-language acquisition *could* circumvent the need for substrate input to a creole.

7.5.6.4 Discussion   We raise the possibility that, as a consequence of creolization, SVCs arise from semantically multiple-valence verbs and subsequently some of the secondary verbs in SVCs are reanalyzed as object markers (Lord 1982), causative markers (Kegl 1985), aspect markers, and so on. If serial verbs are indeed marked structures in adult, non-recently emerged languages (like English), then we *might*, over time, expect a gradual decrease in the number of SVCs in favor of more traditional single-verb clauses. Or, we may expect that languages with a creole in their history would be more likely to have SVCs. However, because SVCs do remain an option in the universal inventory of language structures, once recruited, the option of using such constructions would be expected to remain in the syntactic inventory of the language. SVCs arose in ISN in the absence of any substrate influence, African or otherwise, and despite some encroachment from syntactically multivalence verbs, they remain in the syntactic inventory of the language.

We now move away from the debate between the Language Bioprogram Hypothesis and the African Substratum Hypothesis and consider the function a SVC serves. Verbs are characterized by not only a representation specifying the arguments they require syntactically but also by a more semantically based representation—a Lexical Conceptual Structure (LCS; see Hale and Laughren 1983; Jackendoff 1990). The LCS decomposes a verb's meaning into semantic concepts like GO, BE, STAY, and MOVE. It also includes elements bearing certain semantic/thematic roles like event, state, goal, source, theme, place, and so forth with respect to the verbs. In essence, the LCS is a *superset* of the information that gets lexically encoded into a verb's representation. Languages vary in terms of the components the LCS maps into the argument-structure representation of a verb or class of verbs.

Consider the possibility that an individual has innately available a complete set of LCSs (conceptual information being independent of language) without having specific information as to how these LCSs are mapped to the lexical items at hand for purposes of use in a syntax. Consider also the possibility that early LSN signers/ pidgin speakers have a restricted syntax such that the only way of differentiating grammatical relations and other material predicated of the verb is to have a valency

of only one argument or element per verb. Sequences of single-valence verbs allow these LCSs to be fully expressed using this restricted syntax. As the pidgin expands and stabilizes, single-valence verb constructions become tighter and more constrained, taking on more and more characteristics of SVCs. As the pidgin creolizes, single-valence verb sequences become further grammaticized, are uniformly replaced by SVCs, with those that are strongly associated with high-frequency LCSs tending to be replaced by multivalence verbs. More subjects must be tested before we can pin down the developmental mileposts, but the initial results indicate that such information is extractable from the population at hand. We are just now at the stage where we can engage in detailed elicitation sessions and collaborative analysis of the linguistic details of SVCs as well as a range of other syntactic structures with our LSN and ISN signing colleagues. However, until we have more extensive elicitation data, we hesitate to provide any theoretical proposals for the analysis of these constructions here. The minimal data we have to date fit well with the account proposed by Baker (1989) but are not sufficient to argue for selection of that account over numerous others, including a Chomsky-adjoined VP structure proposed for resultatives and copular constructions by Kegl and Fellbaum (1988, 1989).

7.5.7 Conclusion
In this chapter, we have explored the parallels between various models of creolization and the process of language emergence that we have had the opportunity to observe first hand in Nicaragua. Our agenda has not been to argue that LSN *is* a pre-pidgin and that ISN *is* a creole. On the contrary, our goal has been to demonstrate that the language-emergence process in Nicaragua constitutes one of the few case in which the human bioprogram for language or innate human-language capacities, by virtue of no coexisting language input, have been forced to take a singular role in shaping the emergent language.

We have purposely not followed a formulaic line of argument that plugs ISN into a set of predetermined "creole characteristics," such as those proposed by Bickerton (1977, 1981, 1984). By definition, all of the grammatical characteristics attributed to creoles also appear in noncreoles. Without a means of filtering out noncreoles and their influence on creole characteristics, no such inventory of creole criteria can be maintained. Whether ISN does or does not match this list of criteria is irrelevant. Creolists following an innateness program might consider turning to ISN for a list of innately determined language characteristics unconfounded by coexisting language input, keeping in mind modality-dependent markedness differences, of course.

It is serendipitous that the "clean case" of language emergence turns out to have been a signed as opposed to a spoken language. But, it is also fortuitous in the sense that adding signed-language data to our body of information concerning the conditions under which languages arise allow us to also filter out modality-specific characteristics of language that are tangential to core components of the innate human-language capacity. We have been able in Nicaragua to witness first hand the source point of language genesis. We have discovered that the source of language is within us but that the conditions for its emergence depend crucially upon community.

Notes

1. Throughout this chapter, following standard conventions in the signed language literature, we use _deaf_ when referring to hearing loss and _Deaf_ when referring to cultural identification as a member of the Deaf community.

2. A standard convention for notating signs in American Sign Language is to present the most common English word used as a translation of that sign in all caps. We will use English glosses except in cases where certain translations are better captured using the Spanish gloss. The dual representation here "mimicas/MIMICAS" signals the use of _mimicas_ as both a spoken and signed term.

3. Discussion of what constitutes membership in a Deaf community is a complex issue best addressed from within the Deaf community itself. For an excellent overview of what "Deaf World" means within the North American Deaf community, see Bahan 1994.

4. Over time, with the flourishing of Nicaraguan Sign Language and publicly available education for deaf people, access to Spanish has actually increased. In the early 1980s, trying to elicit the alphabet often yielded a random listing of remembered letters. Typically, signers could fingerspell their names and common color terms and could (many laboriously) look at a printed Spanish word and fingerspell it, frequently without knowing its referent. In recent years, we have begun to see more language-contact phenomena between Spanish and Nicaraguan Sign Language in the form of increased use of fingerspelling and, in a few cases, introduction of signs for Spanish words that previously were not used in signing.

5. By "plantation model," we mean a model that specifically links pidginization to situations where individuals of varying language backgrounds are relocated to serve as slaves on plantations in an area where their primary languages are not dominant. A single language like English or French serves as the superstrate, and multiple, mutually unintelligible languages serve as the substrate. A pidgin arises to facilitate communication between speakers of the substrate and superstrate languages.

6. It is important to note that unlike the acronym ASL for American Sign Language, which has been adopted into both English and American Sign Language, the acronyms LSN and ISN are *not* allowable acronyms in Nicaraguan Spanish, where pronounceable acronyms are favored. For this reason, we will not use ISN to refer to the current Spanish name used as a cover term for the signed language forms in Nicaragua, which we expect will eventually acquire an appropriate pronounceable acronym. We will use the acronym ISN only as a research term to refer to the fully emerged form of Nicaraguan Sign Language, excluding the peer-group/pidgin jargon.

7. Singleton et al. (1995) demonstrate a clear discontinuity between gesticulation and nonverbal gesture, and they argue that any continuum from gesture to language (such as the one proposed by Kendon (1988a) and McNeill (1992)) should not use gesticulation as an anchorpoint. Kegl and Morford (1994) and Morford and Kegl (in press) in a companion paper to the LSN/ISN comparison presented here, explore the nature of the boundary (whether it is qualitative or a matter of degree) between Mimicas and LSN, along with attempting to identify in Mimicas precursors of the grammatical features characteristic of LSN and ISN.

8. See Goldin-Meadow and Feldman 1975. This article has been followed by numerous studies that further examine the characteristics of home-sign systems (Butcher, Mylander, and Goldin-Meadow 1991; Feldman, Goldin-Meadow, and Gleitman 1978; Goldin-Meadow 1982, 1993; Goldin-Meadow and Feldman 1977; Goldin-Meadow and Mylander 1983, 1990; among others).

9. We thank Bencie Woll for pointing out that a larger signing space and symmetrical use of the two hands is strongly characteristic of International Sign Language as well. International Sign Language is a pidgin that is used in situations where signers do not share a signed language in common (Moody 1987; Woll 1990; Supalla 1991).

10. In language-contact situations between Deaf signers and hearing speakers, the bimodal communication mode between them does not simultaneously provide equal information in each modality. An individual's communication in this situation may be "speech driven," meaning that the underlying structure is predominantly based upon knowledge of a spoken language and not a signed language; or it may be "sign driven," meaning that the structure of a signed language is predominant and speech, when accompanying, is accommodating to that mode (see Maxwell and Bernstein 1985 and Stewart, Akamatsu, and Bonkowski 1987). In speech-driven signing, we also have the added confound that was noticed by Singleton, Goldin-Meadow, and McNeill (1995). Gesture accompanying speech tends to be far more impoverished than gesture alone.

11. This signer, although she identifies strongly with the Deaf community, actually has a bit of residual hearing—enough to benefit somewhat from a hearing aid for the short time she had one, which was about 6 months. She has more Spanish skills than most.

   Also note that in sign-driven PSN, the signing base is variable and could be from Mimicas, LSN, or ISN.

12. Except for a social worker who had a deaf daughter, this teacher was the one staff member at the vocational school who signed the most with her students. Her signing skills could still be characterized as minimal, although her ability to comprehend LSN surpassed her ability to produce it. This excerpt is taken from a class she was teaching to predominantly Deaf students.

13. Such nonmanual markers of future tense have been identified in ASL by Aarons, Bahan, Kegl, and Neidle (1995).

14. Again, this is a recognized feature of ASL (Baker and Padden 1978).

15. A close look at the regularities in gesture found in PSN suggests that it may be worthwhile to take a closer look at gesture influences on purely spoken pidgins as well.

16. By "first generation" we mean the first cohort of home signers to enter the schools. These are the set of individuals entering in 1977–1980. It is not clear how to define generation from this point on since there are so few cases of familial deafness. In the case of Santos, whose uncle was a member of this initial group (having entered in 1977 at age 7) and who, by the way, patterns more with ISN than LSN signers, we have a traditional generation. Given the rapidly changing nature of the language and the language pool, it is not clear that to speak in term of generations gives us any explanatory benefit. It is more practical at this point to speak in terms of chronological year of entry and age at entry to the schools rather than in terms of generations. Senghas (1995b) uses these categorizations as a base and examines the extent to which these two factors can be linked to differences in grammatical complexity that are hypothesized to differentiate between LSN and ISN.

17. The entire population of Nicaragua is 3.5 million, most of which is centered in Managua, so a population study is indeed tractable.

18. These cartoons had been used by Kegl in previous studies to elicit narratives from Deaf ASL signers and were originally used at the National Technical Institute for the Deaf in Rochester, New York, to elicit written English essays from entering college students.

19. The term "signed language" used here is not intended to extend to secondary sign languages such as the signed languages developed by hearing aborigines in the North Central Desert of Australia for situations requiring speech avoidance or certain ritual communication (Kendon 1988b). Secondary signed languages, often strongly influenced by the spoken languages they co-occur with, often lack many spatial grammar components.

20. The individuation of the referents associated with CHILDREN would typically have been established earlier in the discourse or would be first established here via a kind of backward anaphora. It would be redundant to doubly specify the distributive marking within a single sentence. The phrase MAN POINT$_i$ is used to establish a relation between MAN and an arbitrary point in the signing space that thereafter will serve as a referential index for that referent, as it does in the subject agreement on LOOK-AT.

21. This construction was first observed by A. Senghas and is described in Senghas 1994, 1995b.

22. Berenz (1996) notes a parallel phenomenon in Brazilian Sign Language, where NPs are reduced in a similar fashion when serving as anaphors.

23. We have included this slight discrepancy in the narrative, where the anaphor is built from *fly* rather than *crashed*, to illustrate that there are some verbs than tend to get chosen over others. It may have to do with their ability to be nominalized. Note here than *crash* is unaccusative (lacking an external argument at D-Structure), whereas *fly* is unergative (having a D-Structure external argument (i.e., the referent, X). We are not ready to pursue this issue here.

24. The symbol "#" in these examples indicates that the point or pointing complex is an enclitic that forms a single phonological unit with the verb.

25. Supalla (1990) describes exactly this sort of serial verb construction with respect to motion/location verbs in American Sign Language.

26. For a discussion of morphological verb classes in ASL, see Padden 1988.

27. The temporal postposing of person-agreement markers, as in the LSN verbs for SPEAKING and LOOK-AT, come about as close as signed languages get to isolated morphology. Similar constructions have been noted by S. Supalla (1986) in the signed output of some young deaf children of hearing parents in the United States whose primary input is Manually Coded English. Susan Fischer (personal communication) noted the similarity of these postverbal pointing gestures to what have been identified in other signed languages as auxiliaries (Bos

1994; Fischer 1992, 1993; Smith 1990; Engberg-Pedersen 1993). In those languages, these forms typically occur with verbs that cannot be spatially inflected. These pointing enclitics in LSN maybe precursors to auxiliaries in ISN.

28. Recall that LSN signers, currently also exposed to ISN can and do incorporate some of its features into their signing, so we would not predict zero occurrence of person inflection.

29. The sign for WATCH is unrelated to the sign for LOOK-AT and involves resting one's chin on one's fist while looking upward. This points to a distinction between LSN and ASL, where aspectual distinctions that would be signaled morphologically in ASL are realized with distinct lexicalizations in LSN. Where, in LSN we see vocal/mouth gestures (like the rapid protrusion and retraction of the tongue while vocalizing "blʌlʌlʌlʌlʌlʌlʌ") that co-occur with nonmodulated signs like FALL to signal iterativity; in ISN these mouth gestures are often mirrored by circular reduplicative movements over the course of the path of "falling" that suggest the beginnings of a realization of aspectual morphology on the hands. This is another feature of the grammar that we are tracking but do not yet have quantitative data analyzed for.

30. This sign is used to depict egg-shaped objects. Many fruits and vegetables are signed in compounds that specifies how they are prepared (cutting lengthwise, in slices, squeezed, etc.). All the cutting signs here involve a flat open palm handshape. Some three-part compounds also specify if they are to be drunk versus eaten.

31. The deverbal anaphors mentioned earlier would also fall into this category but are clearly not SASSs.

32. Classifiers in ASL were first identified by Frishberg (1974), further elaborated on by Kegl and Wilbur (1976), and analyzed in great detail in the context of verbs of motion an location by both T. Supalla (1982, 1986) and McDonald (1982). We use a different analysis of classifiers; this analysis appears in Shepard-Kegl (1985) and Kegl and Schley (1986).

33. Kegl (1985) presents an analysis of handling classifiers as causative markers in ASL. Kegl and Schley (1986) present an analysis of object classifiers in ASL.

34. The translation of the excerpt of this ASL speech is taken from Padden and Humphries 1988.

35. A handful of deaf children were enrolled in a school for special education that was established by Hope Somoza in 1977. (At the time, the Somozas had a child with special needs.) However, these children were not in classes together and, by their own report, did not learn or use any signs among themselves at that time. However, this school was made public in 1980 and currently serves as the primary school for Deaf children in Managua. So, that first handful of deaf children did constitute part of the first generation of LSN signers and are among the signers we are documenting. Despite their reports to the contrary, we are conservative in counting their initial contact as occurring in 1977.

36. In 1995, Kegl and Morford identified a deaf (homesigning) mother and hard-of-hearing son on Corn Island, and in 1998 Kegl identified and tested a deaf (homesigning) mother with a deaf son. Both mothers (in their 50s) had limited gestural communication. The first son used home signs but considered spoken English his primary form of communication. The second son had learned to sign from peers in school, but does not use ISN with his deaf mother.

37. The details of this development from mimicas to LSN and the demarcation of the boundary between the two is left to a companion paper by Morford and Kegl (in press).

38. We refer to ISN as a single entity, although it is obvious there are, even within the school, dialectal/idiolectal variants of ISN. All of these variants of ISN, however, share an increased and consistent use of previously sporadic grammatical devices as well as other new, qualitatively different grammatical devices. Although a "continuum" is evident within ISN, it is still noticeably disjunct from the varying dialects/idiolects of LSN.

39. If at any point, a group of bilinguals existed in the substrate, these were they. However, the dyslexic hearing students were peers only at the vocational school (ages 15 and up), and with the establishment of the Deaf Association and increased group identity among Deaf students, this interaction quickly waned—even in the school environment. What was striking was the lack of Spanish influence on their LSN and the abrupt decline in their use of LSN once they were no longer accepted as peers. Even the formerly most fluent among these hearing signers have had no contact with the Deaf community since about 1988. Since 1990, however, there has been an increased interaction of some hearing (typically younger) siblings of Deaf signers in Association and Community affairs, filling the roles of interpreter, Association secretary, and so forth.

40. This is clearly related to the change in philosophy on the part of the Ministry of Education in 1992 to support the used of Nicarguan Sign Language in the curriculum.

41. We have not presented here the data that demonstrate that most signers age 15 or older at their first contact with the community, who had no prior mastery of a first language (i.e., Spanish), do not even master the basics of LSN. These individuals remain "minimal language skills signers"—namely, languageless for life. These cases are discussed by Kegl and Morford (1995) and Morford and Kegl (in press).

42. However, see Thomason and Kaufman 1988 for counterexamples and arguments to the contrary.

43. Following Boas (1917, 4), Thomason and Kaufman (1988, 11) characterize genetic relation as follows: "a claim of genetic relationship entails systematic correspondences in all parts of the language because that is what results from normal transmission: what is transmitted is an entire language—that is a complex set of interrelated lexical, phonological, morphosyntactic, and semantic structures." They claim (p. 10) "that languages arising outside of normal transmission are *not* related to *any* antecedent system." [their emphasis]

44. We will return to an issue raised by Thomason and Kaufman (1988, 150) regarding the process they term "abrupt creolization," which we will argue best characterizes the Nicaraguan case. In this case, they argue that the form that feeds creolization is not a pidgin but an emerging contact language in a pre-pidgin state.

45. Thomason and Kaufman (1988, 149) clearly state that "a pidgin is by definition a second language."

46. Baron (1975) proposes a power-based distinction between pidgins and trade jargons.

47. By late-learner characteristics, we mean incomplete or inconsistent use of strictly ISN grammatical devices. We take the term *late learner* from work by Newport (1990), Mayberry (1993) and Mayberry and Groschler (1994).

48. Kegl and Morford (1995) and Morford and Kegl (in press) are part of an ongoing research project that attempts to see if elaborate gestural communication in a homesign situation might be a predictor of better success in language acquisition after contact, possibly even for older signers. If so, it would force use to reconsider the point at which pidginization is postulated to occur.

49. For us, what exactly constitutes a critical mass has yet to be determined, but we assume that such a critical mass was well exceeded when the schools were established in 1980.

50. While Bickerton's archival data from Hawaiian Creole English (Roberts 1991) and his documentation of still living speakers of the pre-creole pidgin is claimed to be another such case, it is different in kind (Bickerton 1992). Bickerton's evidence is data preserved in the written record, which is by definition only a selected subset of the data available at the time. Furthermore, his data from pre-creole pidgin speakers (the immigrants before 1930) were collected after the fact and not in the creolization and pre-creolization context. We have the

benefit of having been there during what may qualify as the creolization event. As such, whereas our findings still involve interpretation, we had the luxury of being able to directly observe the events as they were happening rather than speculate in retrospect about how they might have occurred.

51. It is important to note at this point that the asymmetric and symmetric pidgins referred to here both involve continua. Each is a cover term for a continuum of pidgins that vary between forms that are more superstrate-like on one end and more substrate-like on the other. Despite this variability, the basic dichotomy remains.

52. For sample critiques, see short notes by Singler (1986) and Nylander (1986).

53. In the United States, over 90% of deaf children have hearing parents whose primary language is English. Among the small percentage of Deaf children of Deaf parents, an even smaller percentage have parents who themselves learned to sign from their parents. For this reason, it has been argued that ASL involves a process of recurrent "recreolization." The term *recreolization* goes back to a paper on sign languages as creoles by Fischer (1978, 329), where she noted the large proportion of nonnative speakers in the communication environment of deaf children (including but not limited to their parents) and pointed out that "most deaf children are forced to *re*-creolize ASL in every generation." Newport (1982, 1988, 1990, this volume) has gone on to examine this situation in great detail in terms of its consequences for language acquisition.

54. This is an asymmetric signed pidgin used between hearing and Deaf signers in the United States.

55. Whatever the analysis, SVCs involve complex syntactic constructions, requiring complex VP and clausal representations and intricate processes for the identification of arguments. They are a major leap in complexity from simple sequences of single valence verbs (Baker 1989; Bickerton and Iatridou 1987; DeGraff 1992).

56. The data to be presented here are taken from pilot experiments performed in the process of exploring the best design for a much larger study. As a result, the data were not elicited under exactly the same conditions. We will select individuals from this group of subjects for purposes of comparison here. The comprehensive reporting of results awaits testing of a much larger number of subjects grouped by date of entry and age at entry into school.

57. We are grateful to Ted Supalla and Elissa Newport for their permission to use these materials with our Nicaraguan subjects.

58. We are grateful to Malia Crawford for transcribing these data.

59. It is interesting to note in this example that the second and third verbs are both unaccusative—verbs whose S-Structure subject is actually a D-Structure object.

60. We do however sometimes see the registration of multiple arguments via a following "auxiliary" consisting of a smooth pointing movement that incorporates points to more than one argument (in LSN signers) or via directional or spatial marking on the verb (in ISN signers). Morphological inflection is independent of the ability of a given verb to allow more than one overt NP argument.

61. Only very rough glosses of the manual signs are used here. Nonmanuals and other morphological details are not coded. Parentheses are used to collapse multiple variants. For example, MAN, WOMAN PUSH (MAN) GET-PUSHED spells out as both MAN, WOMAN PUSH MAN GET-PUSHED and MAN, WOMAN PUSH GET-PUSHED.

62. Causatives and verbs involving handing and manipulation of objects usually have a verb of handling first, with the primary meaning expressed by the second verb.

63. For detailed discussion of role prominence in ASL see Kegl 1985, Shepard-Kegl 1985, and Kegl 1995. For a discussion of the precursors of role prominence markers in homesign and

their grammaticization in LSN and ISN, see Kegl and Morford 1995 and Morford and Kegl, in press.

64. For a detailed discussion of role play, see Loew, Kegl, and Poizner, 1997.

65. Our attention was drawn to this possibility by Viviane Déprez.

66. This sentence and the valency problem with its arguments was originally brought to Kegl's attention by Ursula Bellugi (personal communication).

67. Several notational conventions are used in this example. A nonmanual marker of topic, involving raised eyebrows and head tilted back is realized concurrent with each NP topic: top _____. The line indicates the manual material over which the nonmanual spreads. The subscripts "i,j,k," and "1st p" indicate points established for referents in the signing space. In this case, a distributive plural marker "[distributive]$_{i,j,k}$" establishes a plural referential index for STUDENT with which the verb GIFT-TO exhibits subject agreement. "RP" indicates role prominence. A clitic involving the signer's whose torso can be shifted toward or moved to agree with a third-person referent established at some position in the signing space. In this case, no shift occurs per se. Instead, a default use of narrator's position is used to assigned some unspecified person as the object of the verb GIFT-TO 'give a gift to'. The assignment of role prominence means that the event is viewed from this person's point of view. This is not a passive. Unlike English, ASL can split between a referential and a role-prominent subject. It also sets up this "unspecified referent" to be construed as coreferent with the subject of the sentence TEACHER SURPRISED via a kind of discourse-level backwards pronominalization.

68. By "certifiable," we mean those sequences that are unambiguously SVCs and can be syntactically distinguished from simple sequences of single-valence verbs.

69. More precisely, this signer was between 8 and 9 years of age, depending upon the month in which she entered school, a piece of information we do not currently have available.

70. Actually, these signers were also tested on the Koumal narratives in the population study and subsequent to this experiment included in the subject pool in Senghas 1995b, where they also fell into these two classifications once analyzed.

71. This is the one subject of these three whose receiver was an ISN rather than an LSN signer. In follow-up studies, we will better control for this factor.

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