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PHONOLOGICAL DEVELOPMENT IN A BILINGUAL CHILD

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A man who does not know
foreign languages is igno-
rant of his own.
Goethe

This paper examines one aspect of linguistic competence, i.e., phonological ability, and reports on the course of the phonological development of a six-year-old Spanish-English primary bilingual child. Primary bilinguals (those simultaneously acquiring two languages before about age six) seem to achieve monolingual-like pronunciation in both of their languages, at least as far as a phonetically trained listener can judge. In order to explore such dual oral performance, fragments of spontaneous, informal conversation in Spanish (Chilean Spanish) and in English (General American English) are analysed and discussed in some detail. Some theoretical aspects underpinning phonological processing and bilingual phonology are also touched upon.

1. INTRODUCTION

Bilingualism (and multilingualism, for that matter) is far more characteristic of present-day societies than many monolingual speakers would suppose. And even though bilingualism has received considerable attention —especially in such countries as Canada (officially bilingual) and the U.S.A. (whose strong Hispanic population has turned bilingualism into a political issue)— much still remains to be elucidated in terms of the cognitive processes involved in the acquisition and use of two different languages by the same speaker, the potential advantages that the functioning of the bilingual mind may display vis-à-vis the monolingual mind, and so on.

Bilingual phonology, for one, has not been intensively researched and, therefore, the number of studies is very restricted, both with respect to bilingual speech behaviour in general and bilingual acquisition in particular. As Watson

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(1991: 25) points out, "Phonology is to a large extent the Cinderella of bilingual studies." One reason for this can be put down to the peripherality of phonology in language processing. In fact, the non-specialist usually looks on phonology as being mainly concerned with the mechanics of language realization and, consequently, so far removed from the psychological issues of cognitive development and processing that it fails to attract enough attention.

This paper addresses one aspect of bilingual competence, i.e., phonological ability, and reports on the course of the phonological development of Annette, a six-year-old Spanish-English primary bilingual girl, with the aim of assessing her dual oral performance regarding three major tasks (Watson 1991: 44) which must be carried out by the bilingual (and which the monolingual escapes), namely: i) *differentiation,* ii) *avoidance of interference,* and iii) *learning to categorize acoustic input in two contrasting ways.*

Taped fragments of spontaneous, informal conversation between Annette and her parents and grandparents, were allophonically transcribed and analysed. The transcriptions are sufficiently narrow to bring out some of the finer features of Annette's spoken English and Spanish in keeping with the aim of this paper. The analysis was made only at the segmental level along the lines of a taxonomic-phonemic model; hence, suprasegmental, or prosodic, features were left untouched.

Annette is the daughter of an American father and a Chilean mother, and has consequently been exposed to English and Spanish from birth. Both her parents are college educated and share an upper-middle-class background. Apart from the day-to-day communication with her father, Annette socializes with English-speaking friends her age, and attends the Sunday school of an English-speaking church in Santiago. She has also been in contact with English on her trips to the U.S.A., Australia and New Zealand. Otherwise, she uses both English and Spanish at home and at a bilingual school, with Spanish naturally being the dominant language.

Bilingual children, like Annette, who have acquired their languages before about age 6, are variously termed "early bilinguals" (Taylor and Taylor 1990), "native bilinguals" (Snow 1993), or "primary bilinguals" (Watson 1991) —the term which is preferred in this paper.

2. Modularity and phonological processing

The theoretical notion of *modularity* (Fodor 1983, Jackendoff 1987), whereby an individual's knowledge is viewed not as a single entity but as one which involves a number of separate compartments or *modules,* is indeed a major contribution of recent research on the philosophy of mind and psycholinguistics to our understanding of the ways in which the bilingual mind processes language data. Although the precise nature of modular structure in the mind is still a matter of theoretical debate, Sharwood Smith (1991: 11) contends that "the advantages of viewing the mind as a modular entity are becoming clearer as the debate ensues and inevitably touches upon the interpretation of bilingual behavior."

The modules are highly independent systems, the prime example being the mental grammar which makes up the core of human linguistic ability. Grammatical competence (Fodor 1983) is regarded as being different in kind from a more generalized "encyclopedic knowledge," such as our knowledge of history and physics, as well as our idiosyncratic knowledge of events, people and places. This qualitative difference is important because the grammatical processing mechanisms are entirely independent of the other knowledge systems, and therefore handle the processing of relevant sensory information on their own.

The most recent version of Chomsky's theory of language, 'government and binding', also adopts a modular view. Language itself is regarded as being one of the mind's modules —comprised of a set of subsystems or principles, themselves modular— which operate concurrently in generating and understanding sentences (Wardaugh 1993, Chomsky 1981).

Nash (1997: 70) quotes Steven Pinker as saying that "the mind is like an ancient, jerry-built computer program made up of dozens of specialized "modules," each honed by hundreds of thousands, if not millions, of years of evolution. There are modules for stereo vision and manual dexterity, for understanding numbers and grammatical speech, for sexual jealousy and romantic love. Don't think of them as "detachable, snap-in components", he cautions. [...] A mental module, he says, "probably looks more like roadkill, sprawling messily over the bulges and crevasses of the brain"."

Recent research on dyslexia has shed new light on phonological processing and modularity as it draws attention to the phonological module. Actually, a new model of dyslexia (the phonological model) has emerged which emphasizes defects in the language-processing rather than in the visual system. This phonological model is based on the theory of modular brain organization, as Shaywitz (1996: 99) puts it:

> To understand how the phonological model works, one has first to consider the way in which language is processed in the brain. Researchers conceptualize the language system as a hierarchical series of modules or components, each devoted to a particular aspect of language. At the upper levels of the hierarchy are components involved with semantics (vocabulary or word meaning), syntax (grammatical structure) and discourse (connected sentences). At the lowest level of the hierarchy is the phonological module, which is dedicated to processing the distinctive sound elements that constitute language.

The phoneme, a mental construct, is the fundamental element of the linguistic system. Different combinations of a given number of phonemes produce every word in a language. The phonological module of the brain must first break down, or parse, words into their phonetic units before they can be identified, understood, stored in memory or retrieved from it.

Since 1994, Shaywitz and her Yale co-workers have used functional magnetic resonance imaging (fMRI) in studying the neurobiology of reading. As a result, they have come up with a tentative neural architecture for reading a

printed word, which in turn provides us with the exact location of phonological processing:

> Neural architecture for reading has been suggested by functional magnetic resonance imaging. Letter identification activates the extrastriate cortex in the occipital lobe; phonological processing activates the inferior frontal gyrus (Broca's area); and accessing meaning activates primarily the superior temporal gyrus and parts of the middle temporal and supramarginal gyri. (Shaywitz 1996: 101)

Another significant finding bearing on phonological processing, pointed out by Shaywitz, is the surprising difference between men and women in the locus of phonological representation for reading. In men, it turns out, phonological processing engages the left inferior frontal gyrus, whereas in women it activates not only the left but the right inferior frontal gyrus as well. These findings constitute the first concrete proof of gender differences in brain organization for any cognitive function. The fact that women's brains tend to have bilateral representation for phonological processing helps explain why, for example, after a stroke involving the left side of the brain, women are less likely than men to have significant decrements in their language skills.

The use of functional magnetic resonance imaging (fMRI) —a relatively new, non-invasive imaging technique— has proved to be instrumental in identifying which brain loci are activated, by an increase in the flow of blood, when such cognitive tasks as speaking or gesturing are performed. As reported in *Nature* (Winslow 1997), researchers at the Sloan-Kettering Memorial Hospital's Cancer Center, New York, have successfully employed this technique to capture images of the brain at work, and have found that the ability to speak another language is stored in different parts of the brain depending on the age of the person who becomes bilingual. Joy Hirsch, director of the Sloan-Kettering Functional Magnetic Resonance Imaging Laboratory and coordinator of the above study, claims that becoming bilingual late in life is thoroughly different from doing so earlier on. Thus, little children learning two languages simultaneously (i.e., primary bilinguals) have both languages stored in only one area of the brain. If, on the other hand, a second language is learnt later on —at secondary school, for example— the brain assigns a separate area to process it, according to the researchers. Hirsch says that their investigation does not make it clear at what age the brain begins to assign a separate area for a second language; however, a previous study points out that the process may occur at around ages 7 or 8.

There is unquestionably much to be gained from a modular approach to language-processing, and ongoing research will in all likelihood bring to light a host of new scientific facts within the next few years.

3. Bilingual phonology

The task facing children learning the phonology and phonetics of a single language is intrinsically complex; they must perform the following stages when confronted with an ever-varying mass of acoustic input:

1. learn to recognize distinct, but non-invariant acoustic patterns;
2. deduce the set of oppositions which constitute the phonological structure of the language;
3. associate the acoustic patterns with the phonological system, despite the non-invariance of the former;
4. master the correct articulatory routines to produce acoustic patterns which satisfy other native speakers as being adequate realizations of different phonemes (Watson 1991:27).

None of the four stages listed above, however, is remotely well understood; what they represent is actually only one of many different interpretations of how phonological competence is developed. The bilingual acquisition of phonology clearly poses, by contrast, twice as many problems to tackle. As a matter of fact, at each stage of the acquisition process, children are faced with many more different signals without automatically knowing which language they belong to, while younger children cannot initially even know that they represent two different languages.

In phonology, the first six years or so may be considered a critical period for acquisition. Languages appear to be acquired informally and mastered to nativelike proficiency in the early years, before about age 6, as pointed out above in connection with Hirsch's piece of research. After about age 14, languages have to be learnt with conscious effort and they are likely to be mastered to non-nativelike proficiency —i.e., as far as phonology is concerned, they will exhibit a certain degree of foreign accent.

Taylor and Taylor (1990: 333) mention ten compelling conditions which young children enjoy, from a sociopsychological point of view; older people, on the other hand, enjoy only a few. They are outlined below:

1. Children have a compelling need to communicate.
2. The language they are acquiring is their main means of communication.
3. Children are exposed to speech for much of their working time.
4. Children easily identify with their speech models.
5. Children have imitative impulses.
6. Children are not inhibited in trying out incorrect utterances.
7. Family members tolerate, even delight in, children's "cute errors."
8. Adults gear their speech to children's levels.
9. Speech is used in a concrete way, in a context of here and now.
10. Children's main activities in life are acquiring language(s) and gaining knowledge about the world.

All these conditions are available to young children whether they acquire one or two languages. And also, more importantly in the case of bilinguals, linguistic interference is less likely to be permanent and intractable in children than in adults. As EFL teachers, we know how hard it is for older people learning an L2 to get round the deep-rooted habits of their L1, which invariably intrude into their interlanguage.

How do primary bilinguals learn phonology? To begin with, according to Watson (1991), the main task is one of *differentiation;* that is, the child must

recognize first that the number of different stimuli around him/her represent the combined output of two different linguistic systems, and then identify which elements belong to which system. This is not an entirely difficult process for a bilingual child to cope with because, as Watson puts it, "Most bilingual children seem to be unaware that they are dealing with two different systems until the age of about two, by which time phonological development may be well under way" (1991: 34).

Furthermore, closely related to differentiation, we have *avoidance of interference.* Keeping two languages distinct clearly involves avoiding mutual interference. It is not an easy task because sometimes the two languages are perfectly distinct at the phonemic level, but some noticeable traces of interference show at the phonetic level. Such interference, however, is not universal and hinges, for the most part, on which language is dominant.

The other very important task is *learning to categorize acoustic input in two contrasting ways* so that sounds can be clearly perceived as belonging to one language and not to the other or to both of them. In other words, the phonological module appropriately filters the acoustic signal and matches it with one or the other language.

Let us now see the perceptible outcome of the above three tasks commingled in the oral performance of a primary bilingual.

4. The corpus

The following corpus is made up of representative utterances in both Spanish (Chilean Spanish; henceforth ChSp) and English (General American English; henceforth GA) illustrating spontaneous, informal speech. The recordings were made at different intervals over a fortnight. The informant was, for the most part, unaware of her being recorded, and responded fairly well to the trying process of questioning to elicit linguistic material. At a later stage, both the ChSp and GA utterances were repeatedly listened to and allophonically transcribed in such a way as to highlight those relevant contrastive features which were deemed necessary to achieve the aim of the study. The latest (1993) revision of the IPA was used in the transcriptions.

4.1 *Chilean Spanish*

Transcription Conventions

[ː]=long. [ːː]=extra long. [|]=pause. [||]=longer pause or break. ['']=strong stress. ["]=extra strong stress.

Expected phonetic realizations:

(a) *Vowels:* [i, e, a, o, u, ja, je, jo, ju, ei̯, eu̯, ai̯, au̯, wa, we, wi, wo];
(b) *Consonants:* [p, b, β̞, v, t̪, d̪, ð̞, k, g, ɣ, tʃ, f, s, x, m, n, ɲ, l, ɾ, r, j, dʒ].
NB The accommodatory *dorso*-(front) *velar* stop/fricative articulations (conditioned by a following [j, i, e]) are indicated by the use of [+], and the *dorso*-(back) *velar* ones (conditioned by a following [o, u]) by the use of [–],

respectively (the same convention also applies to the English transcriptions). /o/ is qualitatively nearer to CV [ɔ] than to CV [o], as the usual phonetic symbol (equated with the <o>grapheme) suggests.

Utterances

The following 42 utterances make up the ChSp sample.

—*En español. ¿Cómo estás?*

(1) ¿Español ? ¿Así como "buenos días?"

[ehpa'ɲol | a'si 'k̲omo 'bwenoʊs 'dɪəs *(imitating an American-accented pronunciation)* ||]

—*No, no, así no. Fuerte.*

(2) Canciones

[kan'sjones ||]

—*¿Sólo canciones?*

(3) Sólo canciones.

["solo kan'sjones: ||]

—*¿Te gustan esas canciones?*

(4) Sí.

["si ||]

— *¿Qué es eso, Annette?*

(5) Son unos chocolates que tu abuela te dejó.

['son unoh tʃok̲o'laţeh k̟e ţ̲wa'β̞ wela ţe ð̞e'x̲o ||]

—*No, no escucho.*

(6) Toma tu regalo de cumpleaños.

['ţ̲oma ţ̲u re'ɣalo e k̲umple'aɲo ||]

—*¿Cuál?*

(7) Esto, mira: esto es el dormitorio de nosotros, esto es mi oficina ... esto es mi oficina, podemos hablar lo que quieres ... lo que quieres hacer acá; y ésta, mamá, sabes, ésta es la sala de juego, ¿ya?

['ehţ̲o 'mira | 'ehţ̲o eh e l̲ d̲ormi'ţ̲oɾjo ð̞e nosoţ̲roh | 'ehţ̲o eh mjofi'sina | 'ehţ̲o eh mjofi'sina | po'ð̞emo a'β̞ɾlaɾ lo k̟e 'k̟jereh | lo k̟e 'k̟jere a'seɾ a'ka || 'jehţ̲a ma'ma 'saβ̞ɾeh | 'ehţ̲a 'sala eh la 'sala e 'x̲weɣ̞o | 'dʒa ||]

—*¿Y ésta de acá? Están en un bosque.*

(8) ¿Por qué?

[poɾ'k̟e ||]

—*Porque hay bandidos, ... hay de todo.*

(9) Pero en un bosque no hay bandidos.

['pero en um 'bohk̟e nwaı̯ β̞ɾaɲ̲'d̲ioh ||]

—*En algunos sí.*

(10) No, hay sólo lobos.

["no:ː | 'aı̯ 'solo 'loβ̞ɾoh ||]

—*¿Te gustó el viaje que hicimos a la costa?*

(11) Sí.

['si ||]

—*¿Te gustó la compañía?*

(12) Sí.
['si ||]
—*¿Qué compañía?*
(13) Eh ... el del tío Tom y el de la mami.
[e:: | eɭ̟ d̪eɭ̟ t̪io 't̪om | 'jeɭ̟ d̪e la 'mami]
—*¿Qué me dices de la tía Rosa?*
(14) También.
[t̪a'mjen ||]
—*¿Qué más?*
(15) Eh ... me gustó estar con mi mami y también con el tío Tom, y cuando veía con los "binoculars". Y lo que más me gustó fue estar arriba (de) ese árbol.
[e:: | me ɣ̟uh't̪o 't̪aɾ k̲om mi 'mami | i t̪a'mjeŋ k̲on el 't̪io 't̪om | i 'k̲waɳd̪o β̞̟e'ia k̲on loh bɾ'nɒk̟ʲjʊlə̟z̟ || i lo k̟e 'mah me ɣ̟uh't̪o | 'fwe 't̪aɾ a'ri ese 'aɾβ̞̟ol ||]
(16) Fresca.
['fɾehka ||]
—*Pero ¿por qué fresca?*
(17) Porque yo le hice un dibujo y le pinté todo. Y después ella hizo un dibujo y yo se lo tuve que pintar; ella no lo pintó.
['poɾk̟e 'jo 'lise uɳ d̪i'β̞̟uk̲o i le piɳ't̪e "t̪o:: | i ð̟eh'pwe 'eja 'isuɳ d̪i'β̞̟uk̲o i 'jo se lo 't̪uβ̞̟e k̟e piɳ't̪aɾ | 'eja 'no lo piɳ't̪o ||]
—*¿Está firmado?*
(18) No, ella lo dibujó no más.
['no | eja lo ð̟iβ̞̟u'k̲o no 'mah ||]
—*Bueno, entonces quiere decir mitad de mérito cada una, ¿no es cierto?*
(19) ¡No! Nada que mitad, porque yo le había dado ... yo ... ella me dijo todos los colores, y yo pinté un dibujo, ¿ya?, y ella sólo lo dibujó. Y la única cosa ... lo que estaba haciendo ... estaba leyendo su Quijote. Y no pensaba nada cuando yo estaba pintando su dibujo, el dibujo que yo le hice a ella. Y después ella me hizo uno a mí; pero ella me ... ellos ... en el otro mitad mitad ... pero todo yo (he) hecho más que ellos ... ella sólo dibujó y yo pinté ... dos.
["no:: | "na k̟e mi't̪a | 'poɾk̟e jo le a'β̞̟ia 'ð̟ao | dʒo | eja me 'ð̟ik̲o "t̪o:: loh k̲o'loɾeh | i jo piɳ't̪e uɳ d̪i'β̞̟uk̲o 'ja | i eja 'solo lo ð̟iβ̞̟u'k̲o || i la 'unika 'k̲osa | lo k̟e eh't̪aβ̞̟a 'sjeɳd̪o | eh't̪aβ̞̟a le'jeɳd̪o su k̟i'k̲ot̪e || i no pen'saβ̞̟a "na: k̲waɳd̪o jo eh't̪aβ̞̟a piɳ't̪aɳd̪o su ð̟i'β̞̟uk̲o | eɭ̟ d̪i'β̞̟uk̲o k̟e jo 'lise a eja | i ð̟eh'pweh eja 'miso uno a 'mi | 'peɾo eja me | ejos: | en el oɾo mi't̪a mi't̪a | 'peɾo 't̪o: jo 'etʃo mah k̟e ejos | eja 'solo ð̟i'β̞̟u'k̲o i jo piɳ't̪e | 'dos ||]
—*¿Quién va?*
(20) La Mamá Lucy, la Señora Queenita, y la Señorita Marisabel, y la Señorita Nettie Kins.
[la 'ma'ma 'lusi | la se'ɲoɾa k̲wi'nit̪a | i la 'seɲo'ɾit̪a 'maɾisa'β̞̟el | i la seɲo'ɾit̪a 'neti 'k̟ʰɪnz̟ *(imitating English)* ||]
—*Es una verdadera máquina la Queenie.*
(21) Sí, señorita.
['si seɲo'ɾit̪a ||]
—*¿Para dónde va la Queenie?*

(22) Va (a) salir con nosotros. Ahí viene la máquina.
[ba sa'lir kon no'sotroh || a'i 'vjene la 'makina *(giggling)* ||]
—*¿Fotos?*
(23) Sí. Fotos, mira.
['si || 'fotoh 'mira ||]
—*¿Ésas son fotos?*
(24) No.
['no ||]
—*¿Qué son?*
(25) Sólo páginas que tienen fotos, ... dibujos.
['solo 'paxinah ke 'tjenen 'fotoh ldi'βuxoh ||]
—*¿Por qué termina feliz?*
(26) Porque se casan y todos los malos se mueren.
['porke se 'kasan | i 'to: loh 'maloh se 'mweren ||]
—*¿Quiénes se mueren?*
(27) Los malos.
[loh 'malos:: ||]
—*¿Quién atacó a la Queenie?*
(28) Casi la atacan.
['kasi la'takan ||]
—*¿Dónde la atacaron?*
(29) Casi. Nadie la atacó, pero casi.
['kasi ||'naðje la ta'ko | 'pero "kasi ||]
—*Dile: "Queenie, ladra".*
(30) ¡Arf!
['ɑɻf *(imitating the barking of a dog)* ||]
—*No, pues, háblale como persona.*
(31) Pero ... pe... pe... es que le tengo que hacer ruido.
['pero | pe | pe | eh ke le 'teŋgo kja'ser 'rwiðo ||]
—*Dile: "Queenie, ladra".*
(32) ¡Ladre! ¡Ladre! Nada, ¿viste?
['laðre || "laðre || 'naða | 'vihte ||]
—*¿Cómo?*
(33) Tenemos que salir.
[te'nemoh ke sa'lir ||]
—*¿Para qué?*
(34) Para que la Queenie ¡arf, arf!
['para ke la 'kwini 'ɑɻf 'ɑɻf ||]
—*¿Quién?*
(35) Um ... el pastor alemán.
[um | el pah'tor ale'man ||]
—*¿Cuál pastor alemán?*
(36) El que salta la reja.
[el ke 'salta la 'rexa ||]
—*¿Qué tipo de pájaro?*
(37) Como una paloma. Pobre pajarito estaba lleno de plumas.

[ko'muna pa'loma || 'poβ̞ɾe paxa'ɾiṯo 'ṯaβ̞a 'jenwe 'plumah ||]
—*¿Y qué dijo la María Isabel?*
(38) Le dio pena ... ¡aah!
[le 'ð̞jo 'pena | 'a:: ||]
—*¿Lo viste tú?*
(39) Mm. Yo fui la que descubrí adonde estaba el "body" del pájaro.
['m: | 'dʒo 'fwi la k̟e ð̞ehku'β̞ɾi að̞o̤n̤de 'ṯaβ̞a el 'bɒɾi ð̞el 'paxaɾo ||]
—*No te escucho.*
(40) Si quieres sale a ver.
[si 'k̟jereh 'sale a 'veɾ ||]
—*¿Dónde? ¿En qué parte?*
(41) Allá. ¿Tú conoces la casa donde el pastor alemán salta la reja?
[a'ja || ṯu ko'noseh la 'kasa 'ð̞o̤n̤del pah'ṯoɾ ale'man 'sal̤ṯa la 'rexa ||]
—*Sí.*
(42) En esa casa, en el primer árbol, ahí.
[en 'esa 'kasa | en el pɾi'meɾ 'aɾβ̞ol | a'i ||]

Discussion

The sample displays well-defined, typical ChSp features in Annette's speech. A representative selection of them is listed below.
(i) *Substitution of* [h] *for preconsonantal* [s], as in [unoh tʃoko'laṯeh k̟e ...] (5), even in prevocalic position as in ['eh̤to eh e̤l...] (7), and also in utterance-final position as in [...d̤oɾmi̤'toɾjo ð̞e nosо̤ṯoh |] (7). In some contexts, however, she carefully pronounces —and even lengthens— final [s], e.g., ['solo kan'sjones:] (3), [loh 'malos::] (27), where preconsonantal [s] is replaced by [h] and utterance-final [s] comes out extra long.
(ii) *Elision of syllables,* as in [...'ṯaɾ a'ri ese ...] (15) —a typical elision in colloquial ChSp which results in considerable clipping of words, or dropping of monosyllables— (cf. full forms [...eh'ṯaɾ a'riβ̞a ð̞e ese...]).
(iii) *Elision of intervocalic consonants,* as in [... a'ria ...] (15), (cf. full form [a'riβ̞a]), etc. The elision of [b] in [ṯa'mjen] (14) and (15), instead of [ṯam'bjen], is typical of Annette's age group.
(iv) *Characteristic Spanish dental* [t̪] *and* [d̪] —as distinct from English *alveolar* [t] [d] and *postalveolar* [t̠] [d̠] (Catford 1988: 91)— even when she pronounces English names as in [... ṯio 'ṯom...] (13), and [...'neṯi ...] (20).

Furthermore, note the accommodatory, intrinsic, or co-articulated allophonic alternation of /l/ ([l̪] before [t̪, d̪]); and also the stop realization of /d/ ([d̪]) after /l/, a non-accommodatory or extrinsic allophonic alternation of /d/.
(v) *Characteristic Spanish liquids* [l] [ɾ] [r], as distinct from English [ɬ] [ɻ] [ɹ̠] [ɹ̥̠].
(vi) *Assimilation* of /n/ to /m/ in [... en um 'bohk̟e ...] (9), of /n/ to [ŋ] in [... i ṯa'mjeŋ ko̤n ...] (15). An interesting example of assimilation is illustrated by the pronunciation of "un" as [um] in (37), where [n] becomes [m] in preparation for a following [p], the initial sound of the originally intended

word "perro" —which is not articulated because it is replaced by another, more precise, phrase, i.e., "el pastor alemán".
(vii) *Compression* (Wells 1990) in [... t̪wa'β̞wela ...] (5), [... mjofi'sina ...] (7),[... nwai̯ ...] (9), [... 'jel ...] (13), [... k̟ja'seɾ...] (31) (cf. full forms [mi ofi'sina], [no 'ai̯], [i el], [k̟e a'seɾ], respectively). Note the compressed and elided pronunciation of "lleno de" as ['jenwe] (37), rather than as ['jeno ð̞e], etc.
(viii) [β̞] / [v] *Co-occurrence.* The sample shows the occurrence of [v] as a co-allophone of /b/ —in positions where standard books on Spanish phonology describe only [β] or [β̞]— e.g., [a'i 'vjene ...] (22), [I 'vih̪e II] (34), [...'sale a veɾ II] (42). The occurrence of [v] in these examples can be ascribed to the influence of spelling on pronunciation; however, the context-sensitive [b] occurs initially in [ba sa'liɾ ...] (22) —irrespective of spelling. The elocutionary insistence on pronouncing the <v>grapheme as [v] is, in my opinion, unnecessary pedantry. Conversely, a different phenomenon, which is widespread in Chilean Spanish —and most likely in other Latin American accents as well— is the pronunciation of the <b>grapheme as [v] in contexts where the literature would unequivocally transcribe [β] or [β̞], especially in such combinations as <bl> and <br>. As a matter of fact, I have very often asked some of my undergraduate students to read out the following ad hoc sentence: *"Abramos nuestras biblias en la Epístola de Pablo a los Hebreos;"* and the spoken version has almost invariably turned out to be [a'vɾamoh 'nweh̪ɾah 'vivljah en la e'pih̪ola ð̞e 'pavlo a loh e'vɾeoh], rather than [a'β̞ɾamoh 'nweh̪ɾah 'β̞i̯β̞̟ljah en la e'pih̪ola ð̞e 'paβ̞̟lo a loh e'β̞̟ɾeoh]. As it happens, this fact is not unknown to American lexicographers. Actually, the *Random House Dictionary* (1987) transcribes *Bahía Blanca* and *Blasco Ibáñez* as (bä ē´ä vläng´kä) and (blä´ skô ē vä´ nyeth, -nyes), respectively; likewise, the *American Heritage Dictionary* (1992) transcribes (bä ē´ä vläng´kä) and (bla skō ē-vän´yĕth, -nyĕs), respectively.

In imitating the barking of a dog (32 and 36 above), Annette uses the American "arf" (Agnes 1996) rather than the Chilean "guau," even though she is talking in Spanish. The cultural influence of her American father is noticeable here.

Two examples of code mixing (the use of elements, especially nouns, of one language in the other) can be seen in (15) and also in (39) where she says [bɪ'nɒk̟̊j̟ʊlə˞z̟̊] = *binoculars*, rather than *binoculares;* and ['bɒɾi] = *body*, rather than *cuerpo,* probably because she does not know the equivalent words in her other language.

To sum up, Annette's pronunciation is just like that of any other Chilean girl of her age group and social standing.

4.2 *General American*

Transcription Conventions

[ˑ] = half-long. [ː] = long. [ːː] = extra long. [ʰ] = aspirated. [˭] = unaspirated; *also* audible release of lenis plosive. [̥] = devoiced. [̚] = no audible release. [‿] = no separate release.

[ˌ̪] = dental. [˕] = lowered. [˔] = raised. [̈] = centralized. [̩] = syllabic. ['] = strong stress. ["] = extra strong stress. [|] = pause. [||] = longer pause or break. [̫] = unintelligible. [ʔ] = glottal stop. [ʍ] = voiceless labial-velar fricative (as in the pronunciation of those who distinguish between *which* and *witch* or *where* and *wear*). /ɔ/= [ɒ(ː)] or [ɔˠ(ː)] when rhotacized (Wells 1990).

Expected phonetic realizations:

(a) *Vowels:* [i ̞, ɪ, ɛ̝, æ, ɐ, ɒ̝~ɔˠ, ʊ, ʉ̞, ʌ̞, ɜ˕, ɚ, ə, ɐ̞ɪ, ʊ̞ʊ, äɪ, äʊ, ɔɪ]
NB The CV-based vowel qualities specified here are exactly the ones used below. In order to avoid notational overloading, however, only plain vowel symbols (unless otherwise specified) are employed in the transcriptions.
(b) *Consonants:* [p, b, t, t̪ɹ̞, tʃ, d, d̪ɹ̞, dʒ, k, g, f, v, θ, ð̞, s, z, ʃ, ʒ, h, m, n, ŋ, l, ɬ, ɮ, j, w].

Utterances

The GA sample is made up of the following 41 utterances.

(1) Huh, wow! Those are sharp teeth and they ha ... they're different. These ... are sh ... I think they're sharper than these.
['hʌ | "waːʊ 'ðoʊz ɚ 'ʃɑːɹpˀ 'tʰiθ ənd͡ ðeɪ hæ | ð̞ɛˠ 'dɪfɻənt‿ ‖ 'ð̞iːz̞ː ‸ ɑːˠ ʃː | aɪ 'θɪŋkˀ ð̞ˠ 'ʃɑˠpˀ‿ɚ ðən̪ 'ðiːz̞ ‖]
—*The killer whale. Can you read this?*

(2) The killer whale. Killer whales ... everybody thinks they're killer whales. Some people think the killer whales are not fierce, and blue whales can eat killer whales; that's (the) wrong way because killer whales come in groups and they eat the blue whale.
[ð̞əː 'ɻɪlɚ weɪɬ ‖ 'ɻʰɪlɚ weːɪɬz̞ | 'ɛvɻibɒɾi 'θɪŋks ðɛˠ 'ɻʰɪlɚ weːɪɬz̞ ‖ 'sʌm 'pʰipɬ'θɪŋkˀ ð̞əː 'ɻʰɪlɚ weɪɬz̞ | ɑˠ 'nɒtˀ 'fɹːˠs | ənː 'bluː weːɪɬz̞ kˀ‿ən 'itˀ 'ɻʰɪlɚ weːɪɬz̞ | 'ð̞æts 'ɻɒŋ weɪ bɪ'ɻʰɒz̞'ɻʰɪlɚ weɪɬz̞ 'kʰʌm ɪŋ 'gɻuːps | ən̪ ðeɪ 'it̪ ð̞ə 'bluː weːɪɬː ‖] '
—*They attack them?*

(3) They attack them and they eat them, and they kill them, and they eat them. And sometimes ... in Canada ...they ... when fisher boats are fishing like that, killer whales come and suck the fish, and then they eat it, and then the fishermen pull their fish out and the only thing they pull out is the fish's lips.
[ð̞eɪ ə'tʰækˀ ð̞əm | ənd͡ ðeɪ 'it̪ ð̞əm | ənd͡ ðeɪ 'kɪɬ̪ ðəm | ənd͡ ðeɪ 'it̪ ð̞əm ‖ ən 'sʌmtˀ‿aɪmz̞ | ɪnː 'ɻʰæːnədə̝ː | ð̞eɪ | wɛn 'fɪʃɚ boʊts ɚ 'fɪʃɪŋ laɪkˀ 'ð̞ætʰ | 'ɻʰɪlɚ weɪɬz̞'kʰʌm ən 'sʌkˀ ð̞ə 'fɪʃ | ənd͡ 'ðɛn̪ ðeɪ 'iɾ ɪtˀ‿ | ənd͡ 'ðɛn̪ ðə 'fɪʃɚmən 'pʰʊɬ̪ ðˠ fɪʃ 'aʊɻ̊ | ən̪ ðə 'oʊnli 'θɪŋ ðeɪ pʰʊɬ 'aʊɾ ɪz ðə 'fɪʃɪz l ïps ‖]
—*What happens here? What can they do, the killer whales?*

(4) They can grab a baby sea lion and they take it to outer sea and then they give them a flip with the tail and kill them and play with it and then eat them.
[ð̞eɪ kˀ‿əŋ 'gɻæːb ə 'beɪbi 'siː laːɪən | ənd͡ ðeɪ 'tʰeɪkˀ ɪt̪ tˀ‿u ði 'aʊɾɚ 'siː ənd͡ ðɛn̪ ð̞eɪ 'g̊ɪv ðəm ə 'fɬɪpˀ wɪð ðə 'tʰeɪɬ | əŋ 'ɻʰɪɬ̪ ðəm | əm 'pɬeɪ wɪð ɪɾ ən̪ 'ðɛn 'it̪ ð̞əm ‖]
—*What do they have on their back?*

(5) A dorsal fin.
[ə ˈdɔːˠsɻˈfɪnː ||]
—*What for?*
(6) The killer whales ... I don't know.
[ðə ˈkʰɪlɚ weɪɬz̩ | aɪ ˈdoʊn ˈnoːːʊ ||]
—*It's hard to listen to your own voice.*
(7) Yeah, but you can listen when you talk with your own ears.
[ˈjɛə | b̥ətʼ ju kʼən ˈlɪsn̩ wɛn ju ˈtʰɒːkˀ wɪð jɚ ˈoʊn ˈɪːˠz̩ ||]
—*I know, it never sounds the same.*
(8) Why?
[ˈʍaːɪ ||]
(9) And when you record it? Mo-om, that tape is not recording my voice. I ... hear it.
[ən ˈwɛn ju ɻɪˈkʰɔˠɾ ɪtˀ || ˈmɑ·ɑːːm | ˈðæt͡ˈtʰeɪpʼ ɪz ˈnɒtˀ ɻɪˈkʰɔˠɾɪŋ maɪ ˈvɔɪs | aɪ ˈhɪˠ ɪtˀ ||]
—*What's that, there on that tile?*
(10) Two dogs, and they got married. There's a sun and there's a blue sky, two birds ... and the mountains, and ... she's gonna have a baby.
[ˈtʰuː ˈdɒgz̩ | ənn̩ ðeɪ gɒʔ ˈmæːɻiˌdʼ || ð̩ɚ·z ə ˈsʌːn | ənn̩ ðɚ·z ə ˈbluː ˈskʼaːɪ | ˈtʰuː ˈbɝːːdz̩ | æːnn̩͡d ðə ˈmaʊntʼənz̩ | ən ʃɪz ɡ̈ɒnə ˈhæv ə ˈbeɪbi ||]
—*What's her name?*
(11) Pascuala.
[pʼɑsˈkwɑlɑ ||]
—*And the other one at the back?*
(12) Toffee.
[ˈtʰɒfiː ||]
—*Mm ... Toffee! She has blue eyes?*
(13) Yeah.
[ˈjɛə ||]
—*Why?*
(14) Because they want them with blue eyes. And because there was no black so I had to do it with blue that was the darkest colour.
[b̥ɪˈk̲ʰɒz ðeɪ ˈˈwɒnn̩t̩ ð̩əm wɪð ˈbluː ˈaːɪz̩ *(annoyed)* || ən bɪˈk̲ʰɒz ðɚ· wəz ˈnoʊ ˈblæːkʼ | soʊ aɪ ˈhæt͡ tə ˈduː ɪtˀ wɪð ˈbluː | ˈð̩ætˀ wəz ðə ˈdɑˠkʼəs ˈkʰʌlɚ· ||]
—*What letter is "Bouncy Benn" for?*
(15) For ... "B".
[fɚ·ː | ˈb̥iː ||]
—*And what's that green thing underneath?*
(16) Grass.
[ˈð̩ɻæːs ||]
—*Are they playing there?*
(17) No, they're just walking and they're going to the clinic because she's gonna have her baby.
[ˈnoʊ | ð̩ɛˠ ˈdʒʌs ˈwɒːkʼ̩ɪŋ | ənn̩͡d ðɛˠ ˈɡ̈oɪŋ tʼə ðə ˈkl̥ɪnɪkˀ b̥ɪˈk̲ɒʃ ʃɪz ɡ̈ɒnə ˈhæv ɚ· ˈbeɪbi ||]
—*In what clinic?*

(18) In the dog clinic ... in dog clinic.
[m: | ɪn̪ ðə "dɒ:g̊= klɪ̥nɪkˀ || ɪn "dɒ:g̊= klɪ̥nɪkˀ ||]
—*What are those?*
(19) Tiles. Those tiles that you put on the roof ... and it has a window.
['tʰa:ɪɬz̥ || ðo͡ʊz̥ 'ta:ɪɬz ðət= ju 'pʰʊt= ɒn̪ ðə 'ɻu:f | ənd ɪtˀ 'hæz ə 'wɪndo:ʊ ||]
—*You wanna go with Mama Lucy?*
(20) Yes.
['jɛs::]
—*Why?*
(21) Because I want to go with her ... her and you, Mommy, you know that.
[bɪ'k̲ʰɒz aɪ "wɒ:nt͡ t=ə 'g̲o͡ʊ wɪð hɚ | hɚ ən 'ju: 'mɑmi | ju 'no͡ʊ 'ðæ·æ:tʰ ||]
—*What are those?*
(22) Foxes. And the owners are two beautiful foxes; that ... you and me are the owners of this beautiful house, did you know that?
['fɒksɪz̥ || ən̪ ðə 'oʊnɚz ɚ 'tʰu: 'bju:ɾɪfʊł 'fɒksɪz̥ | ðæt= ≈ 'ju: əm 'mi: ɚ ði 'oʊnɚz əv ðɪs "bju::t=ɪfʊł 'haʊs | 'd̥ɪdju 'no͡ʊ 'ðætʰ ||]
—*What's her name?*
(23) Mrs Foxtailina is her name. "La que se cree la muerte."
['mɪsɪz̥ 'fɒkst=eɪ'li:nə ɪz ɚ 'neɪm || (*switches to Spanish*) la k̟e se 'kɾe: la 'mweɾ̪te ||]
—*Why? Why does she think she's so great?*
(24) Because she says: Oh, this is my house, it's so nice, but look at yours. Mrs Foxtailina, we say, look at your house, this is yours. Oh, mine is so beautiful, that's what she says.
[bɪ'k̲ʰɒʃ ʃi 'sɐz̥ | 'o:ʊ | 'ðɪs ɪz 'maɪ 'haʊs | ɪts 'so:ʊ 'naɪs | b̥ə? 'lʊk= ətˀ 'jɔːˑz̥ || 'mɪsɪz̥ 'fɒkst=eɪ'li:nə wi seɪ | 'lʊk= ət= 'jɔːˑ haʊs | 'ðɪs ɪz 'jɔːˑz̥ || 'oʊ 'maɪn ɪz̥'soʊ 'bju:t=ɪfʊł | 'ðæts wɒtˀ ʃi 'sɛz̥ ||]
—*How did you draw her?*
(25) Mm. Very ugly. Because ... and she puts her ... white tip and she uses nice colours to dress up with, but she's a fox ... ugh ... she's ugly.
[m: | 'ɣɛɻi 'ʌgli || bɪ'k̲ʰɒz̥ | ən ʃi 'pʰʊts ɚ ≈ 'ʍaɪt 'tʰɪp= | ənd̥ˀ ʃi 'ju:zɪz 'naɪs 'kʰʌlɚz̥ t=u d̻ɹ̥ ɛs 'ʌpˀ wɪð̥ | b̥ət 'ʃi: ɪz ə 'fɒks | ʊx | ʃiz 'ʌgli ||]
—*How did he die, though? I don't remember he died.*
(26) No, he got trapped and they took him to the ...
['no͡ʊ | hi g̲ɒt 't̻ɹ̥ æpˀt= ən̪ ðeɪ 'tʰʊk= ɪm t=ə ðə ||]
—*Where? Where did they take him?*
(27) To the zooo!! Huh, huh, huh.
['tʰuˑ ðə "zu::ʷə̯ | 'hʌ hʌ 'hʌ ||]
—*But, in the end, did they save him from that cage?*
(28) No, then he left the zoo, and then they put him back in the zoo, and he stayed there.
['no͡ʊ | 'ðɛn hi 'lɛf ðə 'zu: | ən̪ 'ðɛn̪ ðeɪ 'pʰʊt= ɪm 'bæk= ɪn̪ ðə 'zu: | ən hi 'st=eɪd̪͡ ðɛˑ ||]
—*What's Dinotopia?*
(29) It's where humans and dinosaurs live together side by side.
[ɪts ʍɛˑ 'hju:mənz ən 'daɪnəsɔːˑz 'lɪvˌ t=ʊ'gˠɛðɚ 'saɪb͡ baɪ 'sa:ɪd̪= ||]

—*And where was Will from?*
(30) U.S.A.
['juː ɛs 'eːɪ ||]
—*What about the nannies, the dinosaurs' nannies?*
(31) They had furry water bottles, and they had a saddle. On one side there was a baby, and on the other another baby.
[ð̥ɐɪ 'hæːd̥ˀ 'fɜˠːi 'wɒːɾəˠ bɒɾɬz̥ | ən̪ ðɐɪ 'hæɾ ə 'sæɾɬ || ɒn 'wʌn 'saɪd̪͡ðəˠ wəz ə 'beɪbi | ən ɒn̪ ði 'ʌðəˠ ə'nʌðəˠ beɪbi ||]
—*What's that?*
(32) Waterfall City.
['wɒːɾəˠfɒːɬ 'sɪɾi ||]
—*And ... tell me more about it. How do you get there?*
(33) You have to get on these ...er ... like airplanes but made out of bamboo, and then you fly across to Waterfall City, and then you see the great rock that they made and then hear the waterfalls.
[ju 'hæɪ̯ tˀə 'gˠɛtˀ ɒn̪'ðiːz̥ | ɜˠː | laɪkˀ 'ɛʲpɬeɪnz̥ | b̥əʔ 'meɪɾ 'aʊɾ əv bæm'buː | ən̪ 'ðɛn ju 'flaɪ ə'k̥i̯̊ ɒs tˀə 'wɒːɾəˠfɒːɬ 'sɪɾi | ən̪ 'ðɛn ju 'siː ðə 'gɻeɪtˁ 'ɻɒkˁ ð̥əd̪͡ð̥ɐɪ 'meːɪɾ ən̪ 'ðɛn 'hɪʲ ðə 'wɒːɾəˠfɒːɬz̥ ||]
—*Is it dangerous?*
(34) Very dangerous.
['ʏeɻi 'deɪn̪dʒəɻəs ||]
—*Why?*
(35) Because you can fall down the waterfall, and you're dead.
[b̥ɪ'k̠ʰɒz ju kˀən 'fɒːɬ 'daʊn̪ ðə 'wɒːɾəˠfɒːɬ | ən jɔʲ 'dɛd̥ˀ ||]
(36) I have to think, you know that.
[aɪ 'hæɪ̯ tˀə 'θɪŋkˀ | ju 'noʊ 'ðætʰ ||]
—*What about?*
(37) About doing the drawing. I can do a castle ... and here I can ... and here I'm gonna do a house, after I get dressed, a nice house.
[əbaʊt͡ 'd̪uːɪŋ ðə "d̪ɪ̯̊ ɔːːɪŋ || aɪ kˀən 'duː ə 'k̠ʰæsɬ | ən 'hɪːʲ aɪ kˀən | ən 'hɪːʲ aɪm g̈ɒnə 'duː ə 'haʊs | 'æfɬi̯̊ aɪ gˠɛ_͡'d̪ɪ̯̊ ɛːstˀ | ə 'naɪs 'haʊs ||]
—*Two stories?*
(38) Yes.
['jɛsː ||]
—*What's that? Is that a tropical island?*
(39) Yeah. "Copihues," rabbits.
['jɛə || k̠o'piwes (*Spanish*) | 'ɻæbɪts ||]
—*Rabbits? Are those rabbits?*
(40) Yeah. ... and a rabbit, a ship.
['jɛə || ≈ ənd ə 'ɻæbɪtˀ | ə 'ʃ ïpˀ ||]
—*And who's there?*
(41) You, Mommy, Daddy and me.
['juː 'mɑmi l'dædi əm 'miː ||]

Discussion

Just as in the ChSp sample, the GA sample displays the characteristic features of the pronunciation most widely used in the United States. No appreciable interference from ChSp has been perceived, which is indicative of the independent operation of the two languages.

Even though prosodic features are not accounted for in this paper, it is worth mentioning that intonational contours can be clearly perceived as being different in the two accents; this fact goes to show that both segmental and suprasegmental features do not overlap in either language.

GA phonemes and allophones (both intrinsic and extrinsic) are displayed in such a way that nativelike performance is beyond doubt.

Typical GA features in Annette's idiolect are:

(i) *Rhoticity,* e.g., [... ˈðoʊz ə˞ ˈʃɑːɻpˀ ...]] (1), [[ð̩ɛɻ ˈʃɑɻpˀ=ə˞ ...] (1), etc.
(ii) *T Voicing* (Wells 1982), i.e., pronouncing [t] like [ɾ] in unstressed syllables: [... ˈbjuːɾɪfʊɬ ...] (22), [... ˈwɒːɾə˞ bɒɾɬ̩z̩ ...] (31), [...ˈwɒːɾə˞fɒːɬ ˈsɪɾi...] (32), etc. Compare, however, the careful pronunciation of unstressed [t] in [... ðɪs ˈˈb̩juːːt=ɪfʊɬ ˈhaʊs ||] (22).
(iii) *D Tapping* (Wells 1982), i.e., pronouncing [d] like [ɾ] in unstressed syllables: [... ɻɪˈk̟ʰɔɻɾɪŋ...] (9), [...ən̩ ðeɪ ˈhæɾ ə ˈsæɾɬ̩...] (31), [... ˈmeɪɾ aʊɾ əv...] (33), etc.
(iv) *Long* [æː] (irrespective of phonetic environment), e.g., [...ˈk̟ʰæːnədə̟ː...] (3), [...ˈgɻæːb...] (4), [ˈg̊ɻæːs] (16). Note also the disyllabic pronunciation of *that* as [...ˈðæ·æːtʰ||] (21).
(v) *Wh-* pronounced as [w] in [...wen...] (7), but as [ʍ] in [ˈʍaːɪ ||] (8) and [... ʍɛɻ...] (29), both pronunciations alternate within GA.
(vi) [ɔ] *in complementary distribution with* [ɒ] as co-allophones of /ɔ/, i.e., rhotic [ɔɻ(ː)] as in [...ˈdɔːɻsɬ̩...] (5), but [ɒ(ː)] elsewhere, e.g., [..ˈtʰɒːkˀ ...] in (7) and in [ˈwɒːɾə˞fɒːɬ...] (32). Annette also uses [ɒ] in words where GA has [ɑ], e.g., [...ˈɛvɻibɒɾi...] (2), [ˈfɒksɪz̩ ||] (22).
(vii) [ɬ] varies freely in clusters before vowels, typical GA feature, [...fɬɪpˀ...] and [...pɬ̩eɪ...] (4), but not otherwise (cf. [...ˈkʰɪlə˞...] (2), [...ˈsiː laɪən...] (4), [...ˈlɪsn̩..] (7), etc.).
(viii) Fully voiced [z] between vowels. Note the extra emphatic pronunciation of zoo as [...ðə ˈˈzuːːʷə̟ ||] (2).
(ix) Both *aspiration* and *absence of aspiration* of /p, t, k/ are complementarily distributed throughout the sample, e.g., [... ˈdɑɻk=əs ˈkʰʌlə˞ ||] (14), etc.
(x) *T Glottalling,* i.e., the use of a glottal stop,[ʔ], which masks the release stage of the oral /t/ (Wells 1982). Examples, [... ɡ̊ɒʔ ˈmæːɻid̥ ||] (10), [...b̥əʔ ˈlʊk= əˀ ...] (24).
(xi) *Assimilation* of /z/ to /ʃ/ in [b̥ɪˈk̟ʰɒʃ̟ ʃi...] (24), of /n/ to /m/ in [...ˈjuː əm ˈmiː ...] (22), of /d/ to /b/ in [ˈsaɪb baɪ ˈsaːɪd̥ ||] (29),etc.
(xii) *Centralized* /ɪ/, [ï], in [...l ïps...] (3),and in [...ʃ ïp= ||] (40).

An example of code switching (a change from one language to another in the same utterance or conversation) can be seen in (23): [ˈmɪsɪz̩ ˈfɒkst=eɪˈliːnə ɪz ə˞ ˈneɪm || (*switches to Spanish*) la k̟e se ˈkɾeː la ˈmweɾt̟e ||].

Annette's switch to English reflects the amazing mechanism involved in the processing of a primary bilingual's languages.

5. Conclusion

Annette's two phonological systems have been shown to operate independently and to exhibit their distinctiveness in such a way that monolingual-like performance is readily perceptible to a phonetically trained listener.

The three major tasks pointed out by Watson(1991) in connection with the way in which primary bilinguals learn phonology —i.e., *differentiation, avoidance of interference,* and *learning to categorize acoustic input in two contrasting ways*— are clearly borne out by the samples analysed in this paper. As regards General American English, my observations have been corroborated by two native American speakers, friends of Annette's parents, who agree with me as to the "Englishness" of Annette's oral performance.

Chomsky's and Pinker's conception of language as being a genetic endowment, and, the existence of a genetically determined phonological module render the theoretical notion of *modularity* (Fodor 1983) amenable to experimentation in the area of bilingual phonology. The utilization of functional magnetic resonance imaging (fMRI), as well as other technological breakthroughs, will certainly contribute enormously towards our understanding of bilingual processing before this century draws to a close. In particular, we may well find answers to the main questions addressed in the psycholinguistics of bilingualism, i.e., the representation, storage, organization, accessing, and processing of a bilingual's languages, and the degree to which the bilingual's languages are functionally dependent or independent (Malmkjaer 1991). This paper has touched upon the phonological development of a primary bilingual child, and upholds the independent operation of a primary bilingual's languages.

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