

The Emergence of Adult-like Command of Sociolinguistic Variables: A Study of Consonant Weakening in Spanish-Speaking Children

Manuel Díaz-Campos
Indiana University

1. Introduction

The purpose of this paper is to study sociolinguistic variation by examining it within the individual in order to determine whether there are differences according to speech style in terms of degree of “formality”. Specifically, this investigation examines the acquisition of variable phonology in different speech styles with the purpose of establishing when the emergence of an adult-like command of sociolinguistic variables takes place in children’s speech. Previous research (Díaz-Campos 2001) analyzing acquisition of sociolinguistic variables has presented an analysis based on the interaction between social class and age in order to observe whether lower socioeconomic background children acquire a more standard pronunciation after being exposed to more formal registers at school. The findings indicate that from a very early age the child shows the influence of the sociolect to which he or she is exposed at home. However, lower socioeconomic background children with one or more years of schooling begin showing linguistic patterns consistent with the school input. The present paper further analyzes acquisition of sociolinguistic variable phonology in terms of the interaction between age and style.

Investigations in the area of first language phonological acquisition have focused on examining regularities in the sound pattern of children’s speech (Jakobson 1968, Smith 1973, Stampe 1979, Macken 1980, 1992, Locke 1983, Ingram 1988, 1992, Kent 1992, Bernhardt and Stemberger 1998, Stemberger and Bernhardt 1999, Yoneyama, Beckman & Edwards to appear, among others). Jakobson (1968), for instance, focuses on describing a universal order of segmental acquisition in child language across languages. Jakobson’s structuralist account of child phonology takes into consideration the basic notion of system and opposing units, positing that the child begins acquiring the phonology of his/her language by learning structural distinctions such as consonant vs. vowel, oral vs. nasal, etc.

Generative accounts (Smith 1973, Stampe 1979, Macken 1980, 1992) also describe phonological acquisition based on universal grammar principles. They propose an explanation of how the child discovers patterns and makes generalizations according to those patterns following diverse models within generative phonology from traditional rule-based accounts to more cognitive-driven proposals such as Macken 1980, 1992. Developmental literature concerning child phonology explains phonological acquisition based on physiological and aerodynamic constraints on vocal production. For instance, the tendency to acquire stops first then fricatives can be explained by taking into account that the production of a fricative sound requires more control of vocal tract movements than the production of a stop consonant (Locke 1983:81). According to this perspective, physiological development as well as refinement of vocal tract movements are core elements for explaining general trends in child phonology. Functional explanations about child phonology (Ingram 1988, 1992, Bernhardt and Stemberger 1998, Stemberger and Bernhardt 1999, Yoneyama, Beckman & Edwards to appear) consider other factors to account for general tendencies in child language phonology. Specifically, Ingram 1988, 1992 and Yoneyama, Beckman & Edwards (to appear) study the role of frequency in the acquisition of segmental phonology, while Bernhardt and Stemberger 1998, Stemberger and Bernhardt 1999 present a formal analysis incorporating aspects related to the human cognitive system.

Phonological acquisition as well as other components of linguistic competence necessarily implies variation. The child goes from a newborn with no phonology to having completed the acquisition of the sound system of his/her language. There is notable variation from one month to the next as the child develops control over perception and production. Recent research (Roberts and Labov 1995; Roberts 1994, 1997a, 1997b; Chevrot, Beaud, and Varga 2000; Díaz-Campos 2001) has shown that there is also sociolinguistic-driven variation as the child has contact with different varieties of language within the speech community. Roberts and Labov 1995 and Roberts 1994, 1997a, 1997b study the acquisition of sound change variables in children from Philadelphia. Particularly, Roberts has analyzed the fronting and raising of the nucleus of (aw), as in *cow*, *crown*, *south*; the raising of the nucleus of long (ey), as in *cake* and *rate*; the backing of long (ayO) before voiceless final obstruents, as in *fight*, and *right*; and the deletion of final /t/ and /d/ in word-final consonant clusters as in *just*, *nest*, and *missed*. Roberts' findings reveal that children were learning the internal and external constraints that govern these variable phenomena in the adult model. Given the findings provided by this previous work, one has to wonder whether there is evidence to define variable phonology in child language in terms of style.

2. Previous research

To make an understanding of acquisition of sociolinguistic variables clear, a discussion of the literature analyzing acquisition of variable phonology in English, French, and Spanish is presented. The discussion of the literature concerning acquisition of variable phonology offers a perspective for understanding theoretical and methodological issues related to the definition of sociolinguistic variables as well as sociolinguistic competence in child language. This aspect is crucially important since in the present paper an analysis of the acquisition of sociolinguistic variables within the individual is proposed by observing the interaction between *style* and *age*. The analysis of the interaction between these two factors allows the determination whether older children (i.e. 54 to 71 months-old) favor retention of intervocalic /d/, which is the preferred pronunciation in more formal styles in adult speech.

2.1. Variation in child language

This section is concerned with previous work dealing with the acquisition of sociolinguistic variables in children's speech. There has been interest in investigating this subject matter in English (Labov 1964, Payne 1980, Chambers 1988, Roberts 1994, Roberts and Labov 1995, Roberts 1994, 1997a and 1997b), French (Chevrot, Beaud, and Varga 2000), and Spanish (Díaz-Campos 2001, Díaz-Campos in press).

Labov (1964) presents the first research concerning the acquisition of sociolinguistic variables. He studies the fortition of /θ/ in words such as *think*, *thing*, etc. as well as r-deletion in word-final position and in preconsonantal position (e.g., *car*, *fourth*, etc). Labov's proposal points out that vernacular varieties would be acquired between the ages of 5 and 12 under the influence of the immediate social context, while more standard forms would be acquired later (around age 14) when the individuals began having contact with other members of the linguistic community outside of their friends and family.

This idea that sociolinguistic variation is acquired late in adolescence have been revised in different investigations dealing with acquisition of dialectal features (Payne 1980, Chambers 1988) as well as research done in the acquisition of phonological variation in English, French, and Spanish. Payne (1980) examines whether children who move from their native dialectal region to a new one acquire the phonological system of the latter. According to Payne, phonetically conditioned phenomena are easier to acquire than morphologically conditioned phenomena. Specifically fronting of (aw); centralization and backing of (ay); fronting and centralization of (uw) and (ow); raising of (oy) was found easier to acquire than the short-a pattern. He also found that the dialectal variety spoken by the parents as well as the age of arrival were important factors in determining the rate of success of the child in acquiring the new dialect. Chambers (1988) also studies the acquisition of dialectal features in a group of Canadian children whose families immigrated to the city of Oxfordshire in southern England. Chambers found that children acquire the features of the new dialect to some

degree. In particular, he points out that the elimination of Canadian pronunciation phenomena advanced faster in the speech of his subjects than the adoption of new features from the new southern England dialect. Both of the studies referred to above reveal that children are in the process of becoming members of the new communities in which their families have relocated.

Roberts (1994, 1997b) examines the acquisition of variable phonology in children from King of Prussia, Philadelphia. She studies the deletion of (t or d) in words such as *just*, *must*, and *missed* and the production of *ing* in children aged 3;2 to 4;11. Roberts's results show that children acquire patterns of variation at an early age. The author found that children were learning the internal constraints that govern /t/ and /d/ deletion in the Philadelphia dialect. Roberts interprets this as an indication that children simultaneously learn patterns of variation and complex grammatical forms.

Roberts and Labov (1995) study the acquisition of Philadelphians' short-a, but focusing on speech samples from children born in Philadelphia. The main point of this work was to compare the acquisition of patterns of stable variation and the acquisition of sound change in progress. The results show that three- and four-year-old children were acquiring the norms of the speech community with regard to the short-a pattern. One important observation is that the children were acquiring this dialectal feature even in environments of lexical change in progress (short-a before /l/ and before intervocalic /n/). According to Roberts and Labov, these findings show that during the preschool period children are able to acquire categorical grammatical rules, variable rules, and sound change in progress.

Roberts (1997a) studies three linguistic variables: (1) the fronting and raising of the nucleus of (aw), as in *cow*, *crown*, *south*; (2) the raising of the nucleus of checked long (ey), as in *cake* and *rate*; and (3) the backing of long (ayO) before voiceless final obstruents, as in *fight*, *right* and *mice*. Roberts' results show that all children were making progress in learning Philadelphia's vowel system. All the children had acquired the fronting of (aw), as well as the fronting of (uw) and (ow). Furthermore, even though the conditioning of the raising of the nucleus of (ey) is more complex, all children acquired this change in progress as well. Based on the results described above, Roberts claims that (1) children in preschool years are learning their local dialect; (2) the acquisition of sound change in progress seems to be influenced by the dialect background of their parents; and (3) it is the female-dominated sound changes that are advanced in early language acquisition.

Regarding the acquisition of sociolinguistic variables in French speaking children, Chevrot, Beaud, and Varga 2000 present an investigation in which they examine post-consonantal word-final /R/. The specific focus of their investigation was to determine whether sociolinguistic variation is acquired in a case-by-case fashion (i.e word by word) instead of the more traditional perspective that proposes the acquisition of variable rules. Chevrot, Beaud, and Varga (2000) include in their study two age groups children: 6 to 7 years of age and 10 to 12 years of age. According to their findings, they locate variability within the "lexical knowledge internalized for each word" (Chevrot, Beaud, and Varga 2000: 315). The location of variability at the lexical level allows explaining the cognitive nature of speech planning as well as the relationship of variable phonology and social constraints. Chevrot, Beaud, and Varga (2000) point out that cognitive constraints are related to speech production phenomena such as simplification of complex structures. Social factors affecting variability include evaluation of social variants, and the relationship between variants and speech register. Leaving aside the issue of the case-by-case hypothesis versus the variable rule hypothesis, Chevrot, Beaud, and Varga found variability in the speech production of their subjects. This is an important aspect to consider since in the present investigation a description of what it means to acquire a sociolinguistic variable will be proposed.

In the case of Spanish, Díaz-Campos (in press, 2001) has studied the acquisition of sociolinguistic variables in speech samples from 30 Venezuelan preschool children. Díaz-Campos (in press) analyzed the role of frequency in order to determine if sociolinguistic variation is acquired in a word-by-word fashion. His results indicate that variability is more likely to be found in frequent words. This is evidence that sociolinguistic variation is acquired word-by-word rather than by acquiring a variable rule.

Díaz-Campos (2001) examines two linguistic variables: 1) intervocalic /d/, and 2) syllable-final /r/. Díaz-Campos's (2001) investigation examines the interaction between *social class* and *age* in order to determine whether lower socioeconomic background children increase their levels of retention of intervocalic /d/ and syllable-final /r/ after one year of schooling under the assumption that such result would mean that this group of children is acquiring the more formal variety spoken at the school

setting. Recall that D’Introno and Sosa (1986) have reported that lower-class adult speakers tend to delete intervocalic /d/ more than middle and upper class speakers. D’Introno and Sosa (1986) also found that deletion of intervocalic /d/ was more likely to occur in informal styles. His findings reveal that 42-53 months-old children show a pattern of variability that is similar to the adults of their immediate community. In the case of 54-71 months-old children, the results indicate that lower socioeconomic background children increase their use of the more formal variants, namely the retention of intervocalic /d/ and syllable-final /r/. Díaz-Campos (2001) is defining sociolinguistic variation within specific groups according to their linguistic behavior in their use of intervocalic /d/ and syllable-final /r/. The present paper takes a step further by examining *style* and *social class* in order to observe whether children show sensitivity in their use of the variants according to the degree of formality. The specific research questions this investigation addresses are as follows: 1.) Is it possible to identify patterns of phonological variation in children’s speech according to style in terms of degree of “formality”? and 2.) Are these patterns similar to what has been reported for adult speakers?

3. Methodology

3.1. Corpus

The corpus of the present investigation consists of recordings in which 30 monolingual Spanish-speaking children were participants. These 30 recordings are part of a larger corpus, *Competencia narrativa de niños en edad escolar*¹ ‘Narrative competence of school-age children’ collected by Dr. Martha Shiro, professor of the Master’s Program in Linguistics at the Universidad Central de Venezuela.

Each interview lasts approximately 45 minutes to 1 hour. The recording session included four different parts. The first one consisted of a conversation with the children including questions such as: (1) How old are you? (2) How did you celebrate your birthday? (3) Do you have brothers and sisters? (4) Do you play with your brothers and sisters? (5) Do you get along with them? (6) What does your father do for a living? (7) What does your mother do for a living? (8) Does your father or your mother read stories to you at night? (9) Can you tell that story? (10) Who do you play with at school? (11) What is your favorite TV program? (12) What is that TV program about? There were several other questions with the same characteristics.

The second part of the interview included a trigger situation in which the interviewer was trying to obtain a story where the children were emotionally involved. Labov (1972) suggests that topics triggering the speaker’s emotional reaction are more likely to produce casual speech. The classical Labovian interview includes topics such as the danger of death in order to initiate the emotional involvement of the speaker during the conversation. Labov points out that talking about accidents, sickness, and natural disasters may be appropriate to generate the conditions for emotional speech. The topics suggested by Labov (1972) were adapted to the interviews of the children in this research. The interviewer shared a personal experience with the child as follows: “One day I was in the kitchen serving myself a glass of Coke and I did not hold the glass firmly. The glass fell down and broke, hurting my feet. Have you ever had something like that happen to you?” Another trigger situation included the following: “One day I was very sick and had to go to the doctor. Have you ever visited the doctor? What was that experience like?” The trigger situations worked very well for almost all the children. They were able to narrate a situation and to express their emotional reactions.

There has been some debate regarding the use of this technique since the assumption is that less attention paid to speech will generate a more casual variety. Even though Eckert (2001) questions that the reason for the emergence of the vernacular is due to the lack of attention, she recognizes that “indeed, audio-monitoring is likely to decrease when we are having fun being ourselves, when we take control of the discourse and talk about the things we care about...” Sharing a personal experience, as triggered by the questions proposed in the present paper, is a way to elicit a discourse in which the speakers will talk about things they care about in an informal style. This is also the case for the toy-play session in which the children had the opportunity to enjoy a fun activity.

The third part of the interview was a play activity with toys representing the characters from the movie *Aladdin*. The characters from *The Flintstones* were also used during the interview. The children were able to narrate their own version of the movie or to create new situations playing with the characters. Lower- and upper-class speakers were very familiar with the characters from both *Aladdin*

and *The Flintstones*. This is also a situation in which one would expect a more informal variety to emerge according to Labov (1972) and Eckert (2001).

Finally, the last part of the interview included a storytelling activity using the tale *La gallinita* 'The little hen'. The child had to retell the story with the pictures of the characters and events in the book. All the situations contained during the interview created a positive environment for obtaining a large amount of discourse suitable for performing a quantitative analysis.

3.2. *The definition of style*

In order to provide an analysis of the data in which we can observe patterns of sociolinguistic behavior within the individual it is necessary to determine whether it is possible to distinguish different speech styles. Even though the protocols for eliciting the data were not specifically designed to obtain formal and informal speech, there are sections of the interview in which children are more likely to engage in narrating a personal experience. It is possible to suspect that when the child engages in this type of emotional speech (see Labov 1972:49) she/he will be more likely to use the variants that are more common in spontaneous speech. Following the criteria proposed by Labov (1972) we have classified the *conversation* section as more careful than the *trigger* and *storytelling* sections where children tend to be more emotionally involved. This way of categorizing the different parts of the interview is useful for analyzing whether children use variable phonology in the same manner that adult speakers from the same speech community.

3.3. *Statistical analysis*

The dependent variable of the present paper is the retention or deletion of intervocalic /d/. These two variants have a clear sociolinguistic value within members of the Venezuelan speech community (see D'Introno and Sosa 1986). As pointed out above (see section 2.1), in previous research (Díaz-Campos 2001) it has been shown that there is a positive interaction between the sociolinguistic factors *age* and *socioeconomic class*, which reveals that lower-socioeconomic background children from 54 to 59 months-old begin to retain more intervocalic /d/ after being exposed to the social variety spoken at school. Based on these previous results presented by Díaz-Campos (2001), four factors were created according to *age* and *style*: (1) careful style produced by 42 to 53 month-old children, (2) careful style produced by 54 to 71 month-old children, and (3) less careful style produced by 42 to 53 month-old children, (4) less careful style produced by 54 to 71 month-old children. The application value selected was retention of intervocalic /d/, so that the influence of the school in children's speech could be observed.

The data was submitted to a logistic regression analysis with GoldVarb 2000. The logistic regression analysis using GoldVarb 2000 provides the probabilistic weight for each one of the factors included within each factor group, indicating the significant statistical contribution of each factor with respect to the dependent variable. The maximum weight is 1.00 and the minimum 0.00. A weight greater than .500 favors the application value and a lesser probability disfavors it (see Sankoff 1988 for more statistical details regarding the software). The justification for including this statistical test is to observe the interaction between the independent variables *age* and *style* and determine which of the variants within each factors affects the retention of intervocalic /d/ in the speech samples we have analyzed. The logistic regression provides the tools for measuring the impact of the variables according to the order of selection and observes the statistical significance of a given variable.

4. Results

In this section, the analysis concerning the interaction between the independent variables *age* and *style* is presented. The results are based on 1,092 tokens. The findings show 83% /d/ retention, and 17% /d/ deletion in children's speech. This general tendency found is very similar to the one reported by D'Introno and Sosa (1986) for adult speakers. Specifically, D'Introno and Sosa (1986) point out that there was 88% retention and 12% deletion of intervocalic /d/. Table 1 presents the results of the interaction between the factor groups *age* and *style* for the current study.

Table 1: Results of the interaction between *age* and *style*.

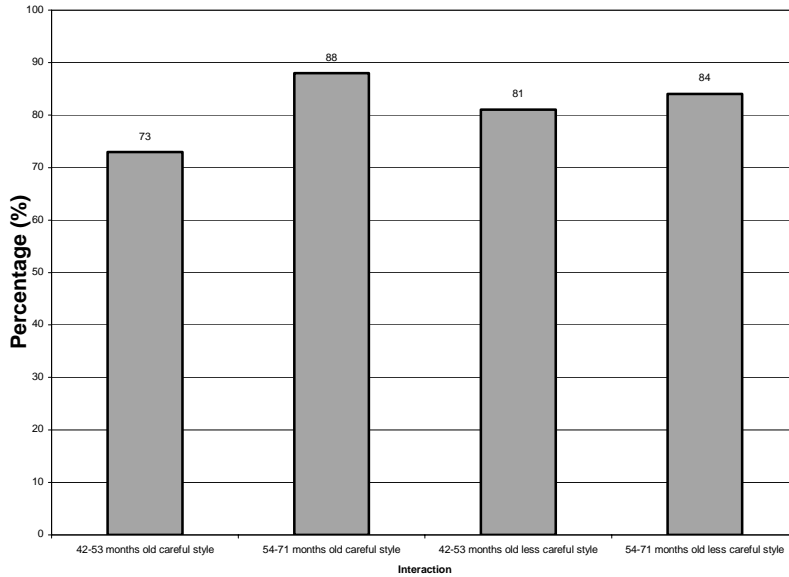
Factor Group	Factor	No of cases	%	Weight
Interaction between <i>age</i> and <i>style</i> .	Careful 42-53 months-old	187/256	73	.338
	Careful 54-71 months-old	406/457	88	.599
	Less careful 42-53 months-old	115/141	81	.455
	Less careful 54-71 months-old	202/238	84	.514
Input probability = .841 (910/1092); sample size per factor in parentheses				

The logistic regression analysis reveals that the factor *careful speech-54 to 71 months-old children* favors the retention of intervocalic /d/. According to regression analysis, this factor group has a significant weight of .599. Recall that any weight above .5 reveals a favoring tendency of the application value, namely the retention of intervocalic /d/. The factor *less careful 54-71 months-old* is in the border line toward favoring retention with a weight of .514. Regarding the factors *careful 42 to 53 months-old* and *less careful 42-53 months-old*, the statistical results indicate that these factors disfavor the retention of intervocalic /d/.

4.1. Discussion

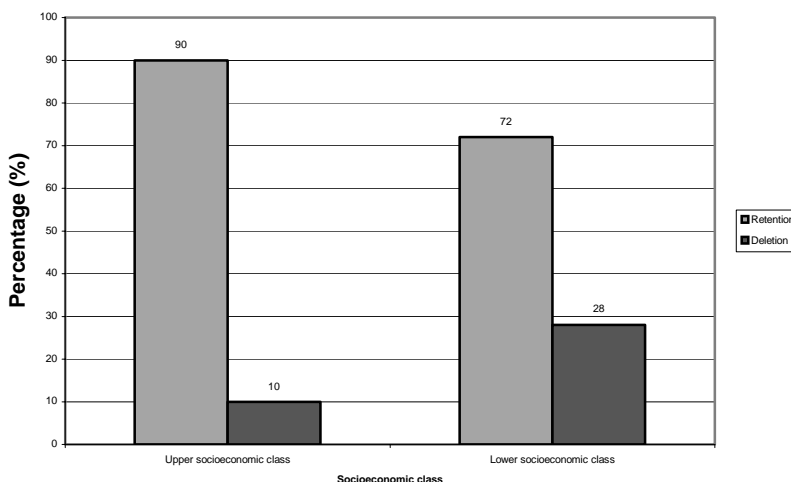
The main point of this investigation is to determine whether it is possible to define sociolinguistic variation in children's speech by differences in the use of variable phonology according to style. By observing speech style differences, the patterns of variation within the individual will be captured. Based on Díaz-Campos (2001), we know that lower-class background children from 54-to-71 months-old increased their levels of retention in comparison to lower-class background children from 42-to-53 months-old. Díaz-Campos (2001) claims that this result reveals that children are using the variants of intervocalic /d/ with a similar sociolinguistic value as adult speakers from the same community. Taking this observation as a point of departure, one would expect to observe differences in the use of the variants of intervocalic /d/ according to *style* and *age*. In other words, if children show individual stylistic variation, the expectation would be to find more retention in the group of children from 54-to-71 months-old in formal styles since these children have been exposed to the variety spoken at school for one year or more. Figure 1 illustrates the tendencies presented in Table 1, so a visual representation of the results described can be appreciated.

Figure 1: Retention of intervocalic /d/ according to age and style



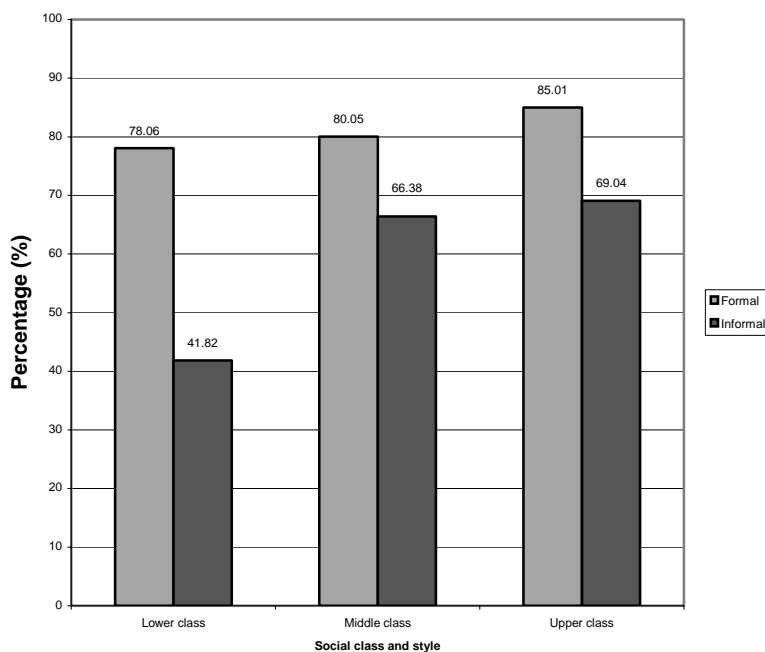
The outcome of the logistic regression analysis reveals that 54-to-71 months-old children tend to retain intervocalic /d/ in formal styles. In the case of the youngest group (i.e. 42-to-53 months-old) in the more careful style, a tendency disfavoring retention is found. This finding is not surprising since this group of speakers is under the influence of speech styles spoken by members of the immediate community in whose speech the more casual variant of intervocalic /d/ would be expected (i.e. deletion). However, a borderline effect is also found in this same group of speakers (i.e. 54-71 months-old children) in less careful styles. What is the role of socioeconomic class? How do we know that these results reflect no more than a simple maturational effect? In order to examine the role of socioeconomic class, we have examined the distribution of retention and deletion of intervocalic /d/ according to socioeconomic class (see Figure 2).

Figure 2: Distribution of intervocalic /d/ according to social class



As can be seen in Figure 2, socioeconomic class plays an important role in the distribution of the variants of intervocalic /d/ in children's speech. Children with a lower socioeconomic background show a lower percentage of retention (72%) than children with an upper socioeconomic background (90%). This finding indicates that retention of intervocalic /d/ in this group of children is not a maturational phenomenon, but a sociolinguistic one. Taking these findings into consideration, one can point out that the tendency favoring retention in 54-71 months old children can be analyzed as a piece of evidence of the emergence of style in this group. Figure 3 presents D'Introno and Sosa's (1986) results for adult Venezuelan speakers.

Figure 3: Retention of intervocalic /d/ in adults speakers according to social class and style (adapted from D'Introno and Sosa 1986: 143)



In formal styles retention of intervocalic /d/ is higher across speakers of all socioeconomic classes, while in formal styles one can see that 41.82% lower class speakers have a reduction in the retention of /d/. As pointed out above, this pattern of sociolinguistic behavior is analogous to the one found in the children's data, revealing that children are learning the constraints related to style of speech at a very early age. The results of the interaction between the factor groups *age* and *style* indicate that it is possible to define the acquisition of sociolinguistic variables in terms of the individual, reinforcing previous findings (Díaz-Campos 2001) in which sociolinguistic variation was defined by observing the interaction of *age* and *socioeconomic class*.

5. Conclusions

This study provides an understanding of what it means sociolinguistic variation in children's speech. The finding that the factor group *socioeconomic class* plays a role in the distribution of the variants of intervocalic /d/ does not reveal whether children are sensitive to constraints such as speech style. For that reason, an analysis of the interaction between *age* and *style* was performed in order to see whether children use the variants of intervocalic /d/ with a similar value than the one found in adult speakers.

Is it possible to identify patterns of phonological variation in children's speech according to style in terms of degree of "formality"? The results reveal that children from 54 to 71 months-old increase their levels of retention of intervocalic /d/ in the sections classified as careful speech. This finding is an indication that children are beginning to acquire style differences that are reflected in their pronunciation. A borderline effect was also found for 54 to 71 months-old children in less careful styles. For that reason, an examination of the role of the variable socioeconomic class was performed in order to rule out that the increase of intervocalic /d/ retention was due to a maturational effect. The findings reveal that socioeconomic class is an important factor. Children with lower class background are less likely to retain than children with upper class background. This piece of evidence allows us to claim that the increase in intervocalic /d/ retention in 54-71 months old children in careful style reveals the emergence of individual variation in this group of speakers.

Are these patterns similar to what has been reported for adult speakers? The findings reported here indicate that children are performing very similarly to adult speakers by increasing levels of retention in more formal styles. Children from 54 to 71 months-old are using the variants of intervocalic /d/ with a sociolinguistic value that corresponds to the adult model.

Notes

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