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THE PERCEPTION OF LINGUISTIC VARIANTS IN DIALECTAL CONTACT: THE CASE OF FORTALEZA-CE

A PERCEPÇÃO DE VARIANTES LINGUÍSTICAS NO CONTATO DIALETAL: O CASO DE FORTALEZA-CE*

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ABSTRACT: This study analyzes the perception of the variable realization of /t, d/ before /i/ in the speech community of Fortaleza-CE in a context of dialectal contact encouraged by intrastate migration, contrasting the categorical palatalization in the capital with the predominance of stops in the interior and southern regions of the state, with emphasis on the Cariri region. The study is grounded in the Theory of Linguistic Variation and Change (WEINREICH; LABOV; HERZOG, 2006 [1968]; LABOV, 2008 [1972]), the social meaning of variation (ECKERT, 2008; CAMPBELL-KIBLER, 2010), and research on dialectal contact and linguistic attitudes (TRUDGILL, 1981; GARRET, 2010). In this context, an adaptation of the matched guise test was applied (LAMBERT *et al*., 1960; OUSHIRO, 2015) with speakers residing in Fortaleza, either native to the capital or migrants. Frequency and proportion analyses and ordinal regression with mixed effects were conducted using R software (R CORE TEAM, 2024). Results indicate that the stop variants [t] and [d] before /i/ are salient in the Fortaleza community and are associated with a higher degree of northeasterner identity, accent, and "sing-song" prosody compared to the palatalized variant, with the perception of this phenomenon influenced both by social factors within the community and by migration experiences.

KEYWORDS: linguistic Perception. Dialectal Contact. Matched-Guise.

RESUMO: Este estudo analisa a percepção da realização variável de /t, d/ diante de /i/ na comunidade de fala de Fortaleza-CE em contexto de contato dialetal incentivado pela migração intraestadual, opondo a categoricidade da palatalização na capital com a predominância de oclusivas no interior e sul do estado, com ênfase na região do Cariri. Fundamenta-se na Teoria da Variação e Mudança Linguística (WEINREICH, LABOV, HERZOG, 2006 [1968]; LABOV, 2008 [1972]), na significação social da variação (ECKERT, 2008; CAMPBELL-KIBLER, 2010) e em estudos sobre contato dialetal e atitudes linguísticas (TRUDGILL, 1981; GARRET, 2010). Nesse contexto, aplicou-se um teste baseado na técnica *Matched-Guise* (LAMBERT *et al*., 1960; OUSHIRO, 2015) com falantes residentes em Fortaleza, nativos da capital ou migrantes. Foram realizadas análises de frequência e proporção e regressão ordinal com efeitos mistos no *software* R (R CORE TEAM, 2024). Os resultados indicam que as variantes oclusivas [t] e [d] diante de /i/ são salientes na comunidade fortalezense e estão associadas a um maior grau de *nordestinidade*, *sotaque* e prosódia "cantada" em contraste com a variante palatalizada, sendo a percepção desse fenômeno influenciada tanto por fatores sociais internos à comunidade quanto pelas experiências de migração.

PALAVRAS-CHAVE: percepção linguística. contato dialetal. *Matched-Guise*.

1 Introduction

A distinct way of speaking is subject to pre-existing and shared beliefs, as well as to various social reactions and attitudes toward it (cf. ECKERT, 2008; CAMPBELL-KIBLER, 2010; GARRET, 2010; OUSHIRO, 2015; AUTHOR, 2024, among others). In the case of the variable realization of /t/ and /d/ before /i/, as in *tia* ("aunt") and *dia* ("day"), we find a particularly interesting phenomenon in the state of Ceará, Brazil. In the capital, Fortaleza, the palatalized variants [tʃ] and [dʒ] predominate, while in inland and southern regions, such as

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Cariri, the stop forms [t] and [d] are more frequent (BESSA, 2010a, 2010b; SARAIVA, 2019). The distinction between Fortaleza and the rural areas of Ceará provides fertile ground for investigating the perception of variants in a context of dialectal contact, understood here as the interaction between two mutually intelligible dialects of the same language (TRUDGILL, 1981). The constant movement of people from the interior to the capital, as well as daily displacements for tourism, commerce, and services, makes frequent contact between speakers who predominantly use either stop or palatal variants.

This study investigates the perception of the variable realization of the alveolar stops /t/ and /d/ before /i/ in the Fortaleza speech community, drawing on the assumptions of variationist sociolinguistics (WEINREICH; LABOV; HERZOG, 2006 [1968]; LABOV, 1972 [2008], 2011), with a focus on the problem of evaluation, which seeks to identify subjective correlates of variable forms. The research also aligns with the "third wave" of sociolinguistics by emphasizing the social meaning of variation (ECKERT, 2012) and examining how the community perceives and relates to linguistic variants (OUSHIRO, 2015).

Three evaluative dimensions were analyzed on a scalar basis: *Northeasternness, accent*, and *sing-song speech*, attributed to each variant. These were examined in relation to social variables intrinsic to the community (region of origin, gender, age, and educational level) and variables specific to migrants (time since migration, reason for migration, and proportion of life spent as a migrant) to determine how they influence perceptions of the variants.

This paper thus contributes to studies on linguistic perception in general and, more specifically, to research addressing dialectal contact, seeking to understand how perceptions vary and are influenced by social factors that extend beyond the classical categories of variationist studies, encompassing also patterns of mobility, migratory trajectories, and the interaction between distinct perceptual norms.

2.1 Linguistic Beliefs and Attitudes: Conceptual Foundations

Linguistic beliefs and attitudes can be understood as an integral part of linguistic competence, since they influence both the production and comprehension of language (Garrett, 2010). Beliefs arise from socialization processes and function as cognitive representations of the social world, serving to organize reality and ground people's attitudes toward certain objects, including linguistic ones.

Linguistic attitudes are structured along three main dimensions: cognitive, affective, and behavioral. The cognitive dimension corresponds to shared beliefs and social meanings; the affective dimension concerns feelings of approval or disapproval toward specific social objects; and the behavioral dimension refers to the predisposition to act in accordance with those judgments (GARRET, 2010; BOTASSINI, 2015). Such actions may relate both to the speaker's own linguistic use and to their interaction with others.

The pioneering study of linguistic attitudes was conducted in the field of social psychology by Lambert *et al*. (1960). To assess attitudes toward bilingualism in Canada, specifically in the province of Quebec, Lambert and colleagues developed the Matched-Guise technique. In this procedure, the same bilingual speaker read a text in French and in English, with all variables controlled so that the only difference between stimuli was the language used. Consequently, francophone and anglophone listeners believed they were evaluating two distinct speakers, when in fact they were judging the same person speaking two languages. Participants rated the recordings on attitude scales including attributes such as intelligence, kindness, and leadership. The results showed that these evaluations reflected social stereotypes associated with each language, revealing that linguistic attitudes are grounded in broader social

perceptions, in this case highlighting the higher social status attributed to English compared to French in that community.

Since Labov (2008 [1972]), the Matched-Guise method has been regarded as a valuable tool for analyzing sociolinguistic variants and has been widely applied in studies of linguistic beliefs and attitudes within variationist research (SENE, 2022). Its main focus is to investigate how people evaluate linguistic variants of a single language, seeking to identify the subjective correlates of variable forms, in line with the sociolinguistic evaluation problem proposed by Weinreich, Labov, and Herzog (2006 [1968]).

In this sense, linguistic attitudes play a central role in shaping and intensifying processes of variation, diversity, and linguistic change. They influence not only internal community practices but also phenomena resulting from migratory processes and contact between varieties (SILVA; GOMES, 2020).

3 Methods and Sample

The questionnaire on linguistic beliefs and attitudes developed for this study was approved by the Research Ethics Committee under protocol CAEE: 68403223.0.0000.505 and aimed to capture social meanings associated with linguistic variation. To that end, a methodological adaptation was implemented, inspired by OUSHIRO (2015, 2019) and by the recommendations in *Research Methods in Language Attitudes* (KIRCHER; ZIPP, 2022). The proposed method approximates the Matched-Guise technique, though it does not strictly follow the original assumption of identical speech excerpts. For this reason, it is referred to here as a Pseudo Matched-Guise design, in which two speakers emulated the stop and palatal variants in thematically equivalent excerpts containing comparable linguistic features but not necessarily identical content.

The stimuli were recorded at the Laboratory of Phonetics and Multilingualism (LabFom-UFC) at the Federal University of Ceará, in an acoustic booth using a unidirectional dynamic microphone (Shure SM48), and saved in .wav format with a 44.1 kHz sampling rate. Two volunteers, one male and one female, both undergraduate students in Letters, residents of Fortaleza with prior residence in the Cariri region, were selected as speakers. Each excerpt was approximately 20 seconds long, consisting of short statements expressing general opinions on political topics and containing around twelve tokens of either the stop or the palatal variant. To ensure consistency, acoustic analysis and stimulus manipulation were performed in Praat (BOERSMA; WEENINK, 2023), guaranteeing that each stimulus contained only the intended variant.

The test was distributed via the friends-of-friends method through the platforms Jotform and QualtricsXM. The final sample comprised 255 respondents, most of whom were natives of Fortaleza (62.35%) or the Cariri region (16.86%), followed by participants from other municipalities in Ceará (12.16%) and from other states (8.63%). In terms of social profile, the majority were women (63.92%), young adults under 29 years old (50.98%), and individuals with higher education or postgraduate degrees (82.75%).

For the migrant population (N = 96), additional variables were considered: reason for migration, with study (38.54%), family (22.92%), other (21.88%), and work (16.67%); time since migration, with up to 10 years (46.88%), between 11 and 30 years (33.33%), and over 30 years (19.79%); and proportion of life as a migrant, in which roughly 40% of participants had lived more than half their lives in Fortaleza. Among migrants from the Cariri region (N = 42), the distribution was more detailed: 45.24% had lived in the capital for less than one-third of their lives, 32.56% between one-third and two-thirds, and 20.93% for more than two-thirds.

Quantitative analyses were conducted in R software (R CORE TEAM, 2023) using ordinal mixed-effects regression models (function *clmm*() from the *ordinal* package). These models considered the interaction between stimuli and social profiles, including a random effect for participant. For model reference categories, the following groups were set as baselines: gender (female), birthplace (Fortaleza), education (higher education), proportion of life as migrant (less than one-third), and reason for migration (other). Results are presented in log-odds and were later converted into probabilities using the *ilogit* function to facilitate interpretation.

4 Analysis and Discussion

The results presented in this section refer to the evaluations made by participants after listening to the speech stimuli. Perceptions were investigated along three specific dimensions — geographic identification, stylistic perception, and prosodic characteristics — which were operationalized through the following statements: (1) "This person is Northeastern"; (2) "This person has an accent"; (3) "This person speaks in a sing-song way." Responses were recorded on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree". The following discussion presents the analysis and interpretation of each of these dimensions.

Table 1 — Ordinal logistic mixed-effects model of *Northeasternness* ratings for /t, d/ before /i/ among residents of Fortaleza (N = 249)

Coefficients	**Logodds**	**S.E.**	**Z-value**	**p-value**
Variant [Stop]	1.929	0.501	3.848	**<0.01***
Gender [male] * Stop Variant	1.691	0.847	1.997	**0.05***
Age * Stop Variant	0.026	0.014	1.836	0.07
Age * Gender [male] * Stop Variant	-0.055	0.025	-2.220	**0.03***
Education [High School] * Stop Variant	0.496	0.366	1.356	0.18
Place of birth [Ceará] * Stop Variant	-0.167	0.446	-0.375	0.71
Place of birth [Cariri] * Stop Variant	0.082	0.405	0.203	0.84
Place of birth [other states] * Stop Variant	-0.663	0.521	-1.273	0.20
Threshold Coefficients				
Strongly disagree|Disagree	-5.524	0.704	-7.843	**<0.01***
Disagree|Neutral	-3.272	0.637	-5.136	**<0.01***
Neutral|Agree	-1.046	0.620	-1.687	0.09
Agree|Strongly Agree	2.168	0.629	3.449	**<0.01***
Random effects				
Variance	2.90			
Standard deviation (S.D.)	1.70			
N (speakers)	249			
Observations	996			

Source: author's own elaboration.

The random effects in the model for *Northeasternness* indicated moderate variance, suggesting that participants' responses were consistently dispersed around the mean. The threshold coefficients showed that most speakers tended to position their evaluations toward the upper end of the scale, favoring "agree" and "strongly agree." The difference between variants proved statistically significant ($p < 0.01$): the stop form was more robustly associated with the attribute *Northeasternness*. In probabilistic terms, the stop variant reached

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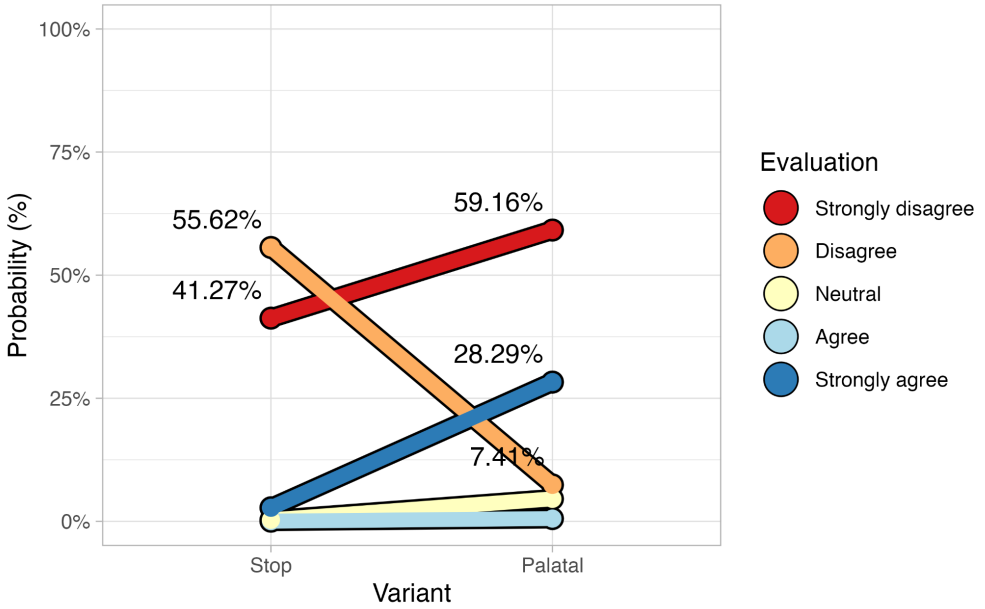
approximately 87% likelihood of being rated in the higher levels of the scale, reinforcing its salience as an identity marker of Northeastern speech.

Figure 1 — Probabilities of *Northeasternness ratings* for /t, d/ before /i/ on a Likert scale (1 – Strongly disagree | 5 – Strongly agree) among residents of Fortaleza (N = 249)



Source: author's own elaboration.

The probability plots reveal that the association between variants and Northeastern identity is distributed unevenly along the Likert scale. Disagreement responses were minimal for both variants (under 5%), but a clearer pattern emerged between the *neutral* and *agreement* levels: the palatal variant concentrated 28.3% of responses at the neutral level and 59.2% in partial agreement, suggesting a more negotiable perception of its connection with Northeastern identity. The stop variant, however, stood out at the "strongly agree" level (55.6%), compared to only 7.4% for the palatal form. These findings indicate that, while both variants can be associated with Northeastern speech, the palatal occupies an intermediate evaluative space, whereas the stop variant is perceived as a stronger marker of *Northeasternness.*

Regarding social variables, both gender and the interaction between gender and age were significant. Among men, the likelihood of associating the stop form with Northeastern identity decreased progressively with age. Model estimates show that a 20-year-old male participant had roughly 74.4% probability of strongly agreeing that the stop form characterizes a Northeastern speaker, while this probability dropped to only 4.5% among men aged 70. This tendency may relate to patterns of social mobility and contact networks. Historically, older men in Fortaleza were more active in professions and public spaces involving interregional interaction — such as transportation, commerce, and construction — which exposed them to diverse varieties of Brazilian Portuguese. In contrast, women in Ceará, particularly up to the 1970s and 1980s, often had more limited social and geographic mobility, typically engaged in domestic work or in traditionally female professions like teaching, sewing, and craftwork (OLIVEIRA, 2007).

As a result, men's broader social networks may have led them to naturalize the stop variant, reducing its perceptual salience as a specifically Northeastern marker and bringing it closer to the prestigious palatal variant of the capital. This interpretation resonates with findings from Bortoni-Ricardo (1985) and Milroy (1980): although their research focuses on language

production rather than evaluation, both show that open social networks tend to promote the diffusion of prestigious forms, whereas dense and closed networks preserve local variants. The perceptual logic seems to mirror this sociolinguistic pattern: older men, embedded in broader networks, relativize the opposition between stop and palatal variants, while younger men maintain the stop as a strongly indexical marker of regional identity.

In the case of migrants from the Cariri region, a specific analysis was conducted due to the linguistic and social contrast between this region and the capital. The results of the ordinal mixed-effects regression model for *Northeasternness* among Cariri migrants in Fortaleza showed moderate variance, with the stop variant presenting a 99.37% probability of being rated in the higher agreement levels ("agree" and "strongly agree").

Table 2 — Ordinal logistic mixed-effects model of *Northeasternness* ratings for /t, d/ before /i/ among Cariri-born speakers residing in Fortaleza (N = 42)

Coefficients	**Logodds**	**S.E.**	**Z-value**	**P-value**
Variant [Stop]	5.056	1.124	4.500	**<0.01***
Time since migration (in years) * Stop Variant	0.012	0.041	0.284	0.78
Proportion of life spent as a migrant [between 1/3 and 2/3] * Stop Variant	2.098	1.181	-1.776	0.08
Proportion of life spent as a migrant [more than 2/3] * Stop Variant	-1.473	1.716	-0.859	0.39
Reason for migration [Work] * Stop Variant	-2.703	1.283	-2.107	**0.04***
Reason for migration [Study] * Stop Variant	-2.359	1.176	-2.005	**0.04***
Reason for migration [Family] * Stop Variant	0.220	1.346	0.164	0.87
Threshold Coefficients				
Strongly disagree|Disagree	-3.738	0.704	-7.843	**<0.01***
Disagree|Neutral	-0.651	0.637	-5.136	**<0.01***
Neutral|Agree	1.804	0.620	-1.687	0.09
Agree|Strongly Agree	5.022	0.629	3.449	**<0.01***
Random Effects				
Variance	1.19			
Standard deviation (S.D.)	1.09			
N (speakers)	42			
Observations	168			

Source: author's own elaboration.

The variables time since migration and proportion of life as a migrant did not significantly alter the evaluation of the stop variant, indicating that length of residence in the capital does not substantially affect the perception of its Northeastern identity. The only significant factor was the reason for migration: individuals who moved for study or work were less likely to evaluate the stop form as typically Northeastern compared to those who migrated for family or other reasons (such as health or lifestyle).

This suggests an attitudinal distinction: migrants who moved voluntarily for educational or professional purposes tend to relativize regional linguistic features, while those who migrated due to external pressures preserve stronger ties to their original linguistic identity. Although this research did not focus on social class, we remind that similar patterns were reported by Alves (1979) in her study of Northeastern migrants in São Paulo, where participants of higher socioeconomic status showed less rigid attitudes toward their variety of origin. It is also important to note that stop realizations of /t/ and /d/ before /i/ are not exclusive to the Northeast; they are common in rural and interior dialects of São Paulo and appear in parts of the South and

Midwest, whereas palatal variants dominate in Northeastern capitals such as Teresina, São Luís, and Salvador (CARDOSO *et al*., 2014). Thus, the less categorical perception of Cariri migrants may reflect both exposure to other Brazilian Portuguese varieties and their specific social trajectories, which modulate how they evaluate variants.

Tabela 3 — Ordinal logistic mixed-effects model of "accent" ratings for /t, d/ before /i/ among residents of Fortaleza (N = 249)

Coefficients	**Logodds**	**S.E.**	**Z-value**	**P-value**
Variant [Stop]	4.224	0.465	9.083	**<0.01***
Gender [male] * Stop Variant	-0.577	0.292	-1.973	**0.05***
Age * Stop Variant	-0.015	0.011	-1.364	0.17
Education [High School] * Stop Variant	0.702	0.362	1.939	>0.05
Place of birth [Ceará] * Stop Variant	-0.078	0.433	-0.179	0.86
Place of birth [Cariri] * Stop Variant	-0.902	0.406	-2.222	**0.03***
Place of birth [other states] * Stop Variant	-0.436	0.535	-0.814	0.42
Threshold Coefficients				
Strongly disagree|Disagree	-4.939	0.624	-7.920	**<0.01***
Disagree|Neutral	-2.403	0.585	-4.108	**<0.01***
Neutral|Agree	-0.767	0.578	-1.328	0.18
Agree|Strongly Agree	2.176	0.584	3.727	**<0.01***
Random Effects				
Variance	2.47			
Standard deviation (S.D.)	1.57			
N (speakers)	249			
Observations	996			

Source: author's own elaboration.

The ordinal regression analysis for *accent* showed a moderate variance among participants' evaluations, indicating a reasonably consistent pattern of responses. The threshold coefficients suggested that the most positive evaluations were concentrated at the upper end of the Likert scale ("agree" | "strongly agree"). For the stop variant, the model estimated positive log-odds corresponding to a 98.6% probability of being evaluated in the higher levels of the scale. The distribution of probabilities along the Likert scale revealed that "strongly agree" responses overwhelmingly favored the stop variant (63.6% versus only 5.2% for the palatal), whereas neutral and disagreement levels were more commonly associated with the palatal form. Therefore, the clearest point of differentiation lies in the highest level of agreement, where listeners most strongly attributed *accent* to the stop variant.

Image 2 — Probabilities of *accent* ratings for /t, d/ before /i/ on a Likert scale (1 – Strongly disagree | 5 – Strongly agree) among residents of Fortaleza (N = 249)

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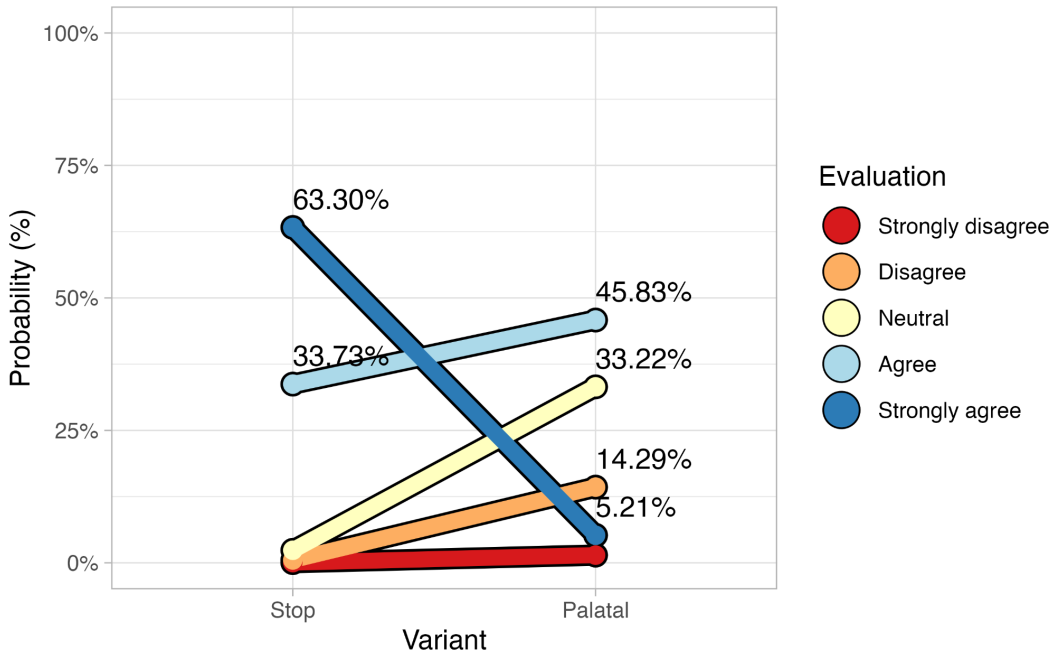


Source: author's own elaboration.

Among social variables, only gender and place of origin produced significant effects on *accent* evaluation. The results showed that men were less likely to associate the stop variant with the idea of an *accent* compared to women. This pattern can be interpreted in light of the gender paradox proposed by Labov (2001): women tend to align more with socially legitimized and standardized variants, while men show greater tolerance for non-normative forms. In this context, women's tendency to assign *less accent* to the palatal variant (and consequently *more accent* to the stop form) can be explained by the fact that the palatalized variant is institutionally established in formal and media contexts — the so-called *"neutral accent"* heard in journalism and educational materials (DACOREGIO, 2021). As for place of origin, participants from the Cariri region were less likely to classify the stop form as accented, with a negative interaction effect (-0.902 log-odds), corresponding to only 28.9% probability of associating it with the idea of an accent. This suggests that for these speakers, the stop variant does not function as a marker of social or regional differentiation, but rather as a natural feature of their everyday speech.

Table 4 — Ordinal logistic mixed-effects model of "accent" ratings for /t, d/ before /i/ among Cariri-born speakers residing in Fortaleza (N = 42)

Coefficients	**Logodds**	**S.E.**	**Z-value**	**P-value**
Variant [Stop]	2.168	1.044	2.076	**0.04***
Time since migration (in years) * Stop Variant	-0.085	0.043	-1.967	**0.05***
Prop. da vida como migrante [between 1/3 and 2/3] * Stop Variant	-0.330	1.119	-0.295	0.77
Proportion of life spent as a migrant [more than 2/3] * Stop Variant	2.403	1.833	1.311	0.19
Reason for migration [Work] * Stop Variant	-0.184	1.267	-0.146	0.88
Reason for migration [Study] * Stop Variant	0.765	1.107	0.691	0.49
Reason for migration [Family] * Stop Variant	3.541	1.364	2.596	**0.01** **
Threshold Coefficients				
Strongly disagree|Disagree	-4.423	0.624	-5.302	**<0.01***
Disagree|Neutral	-2.640	0.585	0.223	**0.04***

Neutral|Agree	-1.191	0.578	5.529	0.43
Agree|Strongly Agree	1.026	0.584	7.382	0.18
Random Effects				
Variance	1.67			
Standard deviation (S.D.)	1.29			
N (speakers)	42			
Observations	168			

Source: author's own elaboration.

For Cariri migrants in Fortaleza, the model again showed moderate variance, with the stop variant estimated at an 89.7% probability of being evaluated at the upper end of the *accent* scale — a result consistent with the general sample. Among social factors, the reason for migration stood out as significant: those who moved for family reasons displayed a strong positive effect (3.541 log-odds), corresponding to a 97.2% chance of perceiving their own variant as accented. This suggests that, unlike migrants who relocated for study or work (and therefore often adapt more easily to the prestige norm), those who migrated due to family decisions or external circumstances are more likely to recognize their speech as different from that of the host community. This finding parallels Alves (1979), who observed that migrants from lower socioeconomic backgrounds tend to value the speech of the destination community more highly, leading to linguistic accommodation. The time since migration and place of origin variables, on the other hand, were not statistically significant. Still, it is important to consider that palatalization of alveolar stops has been described as an expanding phenomenon in Brazilian Portuguese (ABAURRE; PAGOTTO, 2002). As such, more recent migrants encounter a capital city where palatal variants are increasingly dominant, which may heighten their awareness of their own speech as "marked" — reinforcing their perception of the stop form as accented.

The regression model for *sing-song speech* displayed greater variance than the previous analyses (standard deviation = 2.41), suggesting higher inter-speaker variability. Unlike the results for *Northeasternness* and *accent* — which concentrated positive evaluations at the "strongly agree" level — this model showed a broader distribution across the Likert scale. Still, the stop variant had a higher probability of being associated with *sing-song speech* (≈ 60%) compared to the palatal.

Table 5 — Ordinal logistic mixed-effects model of "sing-song speech" ratings for /t, d/ before /i/ among residents of Fortaleza (N = 249)

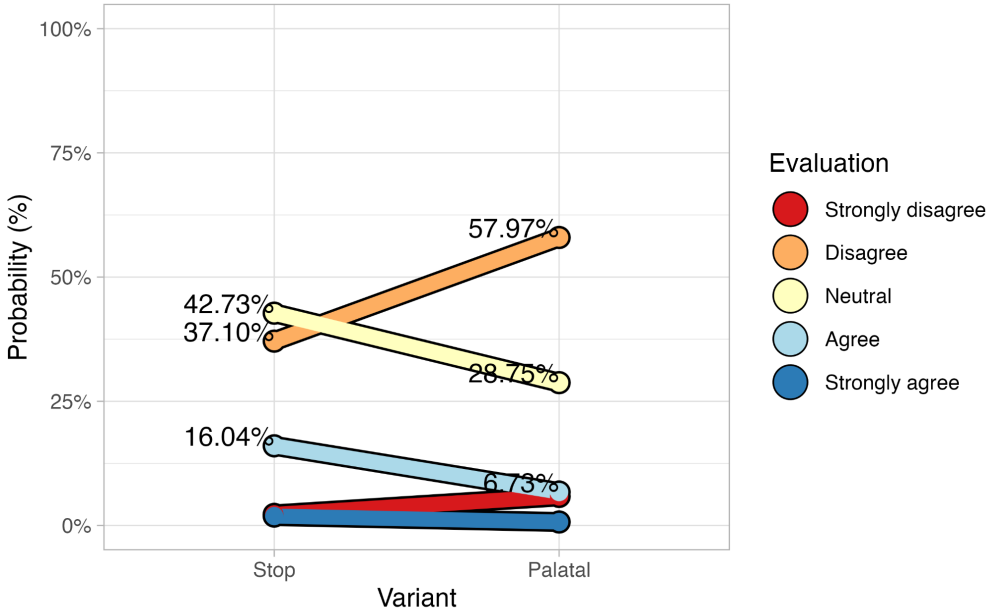
Coefficients	**Logodds**	**S.E.**	**Z-value**	**P-value**
Variant [Stop]	0.408	0.004	101.723	**<0.01***
Gender [male] * Stop Variant	-0.391	0.004	-97.390	**<0.01***
Age * Stop Variant	0.020	0.003	7.454	**<0.01***
Education [High School] * Stop Variant	0.852	0.337	2.529	**0.01** **
Place of birth [Ceará] * Stop Variant	-0.342	0.362	-0.946	0.34
Place of birth [Cariri] * Stop Variant	-0.230	0.354	-0.649	0.52
Place of birth [other states] * Stop Variant	0.262	0.465	0.564	0.57
Threshold Coefficients				
Strongly disagree|Disagree	-3.338	0.624	-16.630	**<0.01***
Disagree|Neutral	0.018	0.585	0.118	0.91
Neutral|Agree	2.009	0.578	482.658	**<0.01***
Agree|Strongly Agree	4.456	0.584	1054.220	**<0.01***
Random Effects				

Variance	5.82
Standard deviation (S.D.)	2.41
N (speakers)	249
Observations	996

Source: author's own elaboration.

When separating levels of agreement, the model estimated a 16.0% probability that participants would associate the stop form with *sing-song speech*, compared to only 6.7% for the palatal. Extreme values ("strongly disagree" and "strongly agree") remained low for both variants (between 0.7% and 5%). The palatal variant received more evaluations in the "disagree" range, while neutral responses were also slightly higher for this form. Indeed, neutrality was the only point where the palatal surpassed 50% probability, indicating that it is not strongly associated with the notion of *sing-song speech*.

Image 3 —Probabilities of *song-song speech* ratings for /t, d/ before /i/ on a Likert scale (1 – Strongly disagree | 5 – Strongly agree) among residents of Fortaleza (N = 249)



Source: author's own elaboration.

Significant predictors in the model for *sing-song speech* included education, age, and gender.

Participants with secondary education showed a higher probability (≈ 70%) of attributing a *sing-song* quality to the stop form — a result possibly connected to the oral tradition of Northeastern culture, marked by popular poetry, troubadour performances, and cordel literature, particularly rooted in the Cariri region and widely disseminated across the state. Conversely, speakers with higher education tended to align more closely with prestigious norms and written standards, reinforcing the distinction between "popular" and "educated" speech (FARACO & ZILLES, 2017). Age also exerted an influence: both younger and older participants associated the stop variant with *sing-song speech*, though to different degrees. A 20-year-old participant still had about 12% probability of disagreeing with that association, whereas for a 70-year-old this probability dropped to 5%, suggesting that with age, the perception of the stop variant as a prosodic feature becomes more consolidated.

Finally, gender again emerged as relevant: men were less likely (≈ 40%) to agree with the *sing-song* evaluation, while women reinforced the association to a greater extent. This may reflect social indexing: men may downplay the feature due to its association with rural or stigmatized speech, whereas women emphasize it as part of regional identity. Interestingly, in the evaluation of *Northeasternness*, men had shown positive associations with the stop variant, suggesting that they do not reject it as a marker of regional identity, but rather perceive it less as a distinct prosodic style.

In the regression model restricted to Cariri migrants, data dispersion was lower (SD = 1.06). The difference between variants remained statistically significant and favored the stop form, which had a 59.9% probability (0.442 log-odds) of being evaluated as *sing-song speech*.

Table 6 — Ordinal logistic mixed-effects model of "sing-song speech" ratings for /t, d/ before /i/ among Cariri-born speakers residing in Fortaleza (N = 42)

Coefficients	**Logodds**	**S.E.**	**Z-value**	**P-value**
Variant [Stop]	0.442	0.002	222.141	**<0.01***
Time since migration (in years) * Stop Variant	-0.024	0.002	-12.591	**<0.01***
Proportion of life spent as a migrant [between 1/3 and 2/3] * Stop Variant	-0.054	0.571	-0.094	0.92
Proportion of life spent as a migrant [more than 2/3] * Stop Variant	0.702	0.002	352.585	**<0.01***
Reason for migration [Work] * Stop Variant	-0.688	0.712	-0.966	0.33
Reason for migration [Study] * Stop Variant	0.275	0.002	138.278	**<0.01***
Reason for migration [Family] * Stop Variant	0.816	0.698	1.168	0.24
Threshold Coefficients				
Strongly disagree|Disagree	-0.176	0.247	-0.710	0.48
Disagree|Neutral	1.922	0.002	1018.014	**<0.01***
Neutral|Agree	3.437	0.002	1820.402	**<0.01***
Agree|Strongly Agree	5.148	0.327	15.763	**<0.01***
Random Effects				
Variance	1.13			
Standard deviation (S.D.)	1.06			
N (speakers)	42			
Observations	168			

Source: author's own elaboration.

Time since migration showed a negative coefficient (-0.024 log-odds), indicating that the longer migrants had lived in Fortaleza, the less likely they were to associate the stop form with *sing-song speech*, in contrast with the general sample. However, when considering the proportion of life spent as a migrant, those who had lived more than two-thirds of their lives in the capital showed a positive effect (0.702 log-odds), suggesting a greater likelihood of associating the stop variant with this evaluation. These findings highlight two temporal perspectives: chronological time, expressed in years since migration, produced a negative effect, suggesting that older migrants have come to perceive the feature as less salient, likely due to its lower visibility when they first arrived; relative lifetime proportion, measured as the share of life lived in Fortaleza, produced a positive effect, indicating that the more integrated migrants are into the urban community, the more they internalize local discourses that frame the stop variant as part of a *sing-song* Northeastern speech style.

5 Conclusion

This study set out to analyze the perception of the variable realization of /t, d/ before /i/ in the speech community of Fortaleza, within a context of dialectal contact marked by the contrast between the categorical palatalization of the capital and the predominance of stop variants in inland regions, especially in the Cariri area.

To achieve this, an adaptation of the Matched-Guise technique was employed, using recorded stimuli evaluated along three perceptual dimensions — *Northeasternness*, *accent*, and *sing-song speech*. These were examined in relation to social variables such as gender, age, education, and place of origin, and, for migrants, additional factors including time of residence in the capital, proportion of life lived in Fortaleza, and reason for migration. The use of ordinal mixed-effects regression models allowed the analysis to capture both community-wide tendencies and subgroup-specific patterns, offering a more comprehensive perspective on perceptual variation.

The results revealed that the stop variant was consistently associated with higher levels of *Northeasternness*, greater identification as an accent, and stronger links to *sing-song* prosody. However, these perceptions were not homogeneous across speakers. Among natives of Fortaleza, interactions between age and gender revealed noteworthy contrasts: younger men were more likely to associate the stop variant with Northeastern identity, whereas older men tended to downplay this association. In the evaluation of *accent*, women attributed *less accent* to the palatal variant — aligning with socially legitimized prestige forms — while Cariri migrants tended to naturalize the stop variant as part of their local norm. Among migrants, the reason for migration also proved decisive: moves motivated by study or work reduced the perception of the stop form as typically Northeastern, whereas family-based relocations increased the likelihood of recognizing it as an accent. In relation to *sing-song* speech, the effects of education, age, and gender were particularly meaningful: participants with secondary education, older speakers, and women were more prone to associate the stop variant with this prosodic feature, whereas higher-educated speakers and men tended to neutralize this perception.

Taken together, these findings demonstrate that in large urban centers such as Fortaleza, dialectal contact must be regarded as an integral part of speakers' daily experience. Alongside linguistic production, there are also patterned ways of perceiving linguistic variation, which are shaped by social stratification and individual trajectories. Linguistic beliefs and attitudes are therefore sensitive to variation and deeply conditioned by social experience. In the case of migrants, such attitudes can generate evaluative pressure, especially when the host community stigmatizes certain forms, prompting speakers to accommodate linguistically as a strategy of social adaptation. Thus, linguistic perception emerges as a privileged field for understanding how speakers assign social meaning and value to variants, and how these evaluations, in turn, sustain processes of social differentiation within urban communities.

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