Language contact and divergent paths of variation: Bilingual rhotics in two island communities

49th Linguistic Symposium on Romance Languages

University of Georgia

Falcon Restrepo-Ramos | Department of Spanish and Portuguese Studies | frestrepo@ufl.edu

UF UNIVERSITY of FLORIDA

STRUCTURE OF THIS PRESENTATION

- Introduction
  - *Sociolinguistic Background*
- This study
  - *The Study*
  - *Research Questions*
  - *Analyses*
  - *Results*
- Discussion
- Conclusion
- Acknowledgements

SOCIOLINGUISTIC BACKGROUND

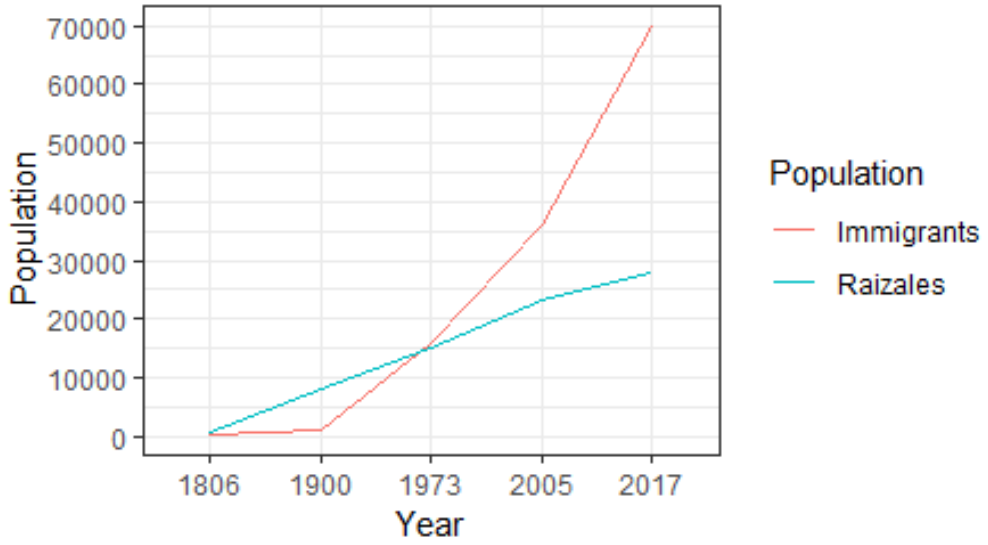
I. The Archipelago of San Andres, Colombia is home to an English-based Creole, known as Islander. A variety derived from the diaspora of Western Caribbean Creoles.

II. There are two main languages in contact in this territory: Colombian Spanish, spoken by Catholic, monolingual Spanish speakers and Islander Creole, spoken by protestant, Afro-Caribbean, bilingual speakers (Islander and Spanish).

III. The Islander-speaking Afro-Caribbeans in these Islands have the ethnonym of "Raizales" so as to be officially recognized as an ethnic group.

SOCIOLINGUISTIC BACKGROUND

IV. Population:



V. Language use: Virtually, all Raizales are bilinguals in Islander and Spanish. Young Raizales are more balanced bilinguals. English is mostly spoken in touristic contexts and Baptist churches.

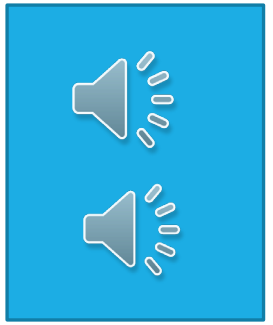
VI. Education: Spanish is the language of instruction in public schools. There are no university institutions in the island.

VII. Language policies: Both Languages are co-official in the islands as per the Colombian Constitution and other language Laws (Law 43, 1993; Law 1381, 2010).

THREE LINGUISTIC VARIETIES IN CONTACT

1. Islander Creole (Raizal Creole henceforth): Language derived from the Twi African Languages and British English. Population, migrated to the islands from Jamaica, and thus, it is mainly, an offshoot of Jamaican Creole.

2. Raizal Spanish: the bilingual Spanish variety emerged from contact and spoken by three generations of Raizales (R1, R2, R3).



3. Continental Spanish: The monolingual Spanish variety spoken by immigrants from mainland Colombia, particularly from the Caribbean coast, who have remained in the islands.

THE STUDY

What? Analyze the production of rhotics in the three linguistic varieties under study by means of acoustic, linguistic and social predictors.

Why? To my knowledge no study has analyzed acoustically the production of these segments (Bartens, 2013).

How? By conducting a cross-linguistic comparison.

Sample: Over 5000 Praat-annotated tokens sampled from 30 Raizal informants Data collected by means of sociolinguistic interviews and other elicitation tasks[1].

Generation	Age Median	Island	Sex
1st Generation	72	San Andres	3 females, 2 males
2nd Generation	46	San Andres	3 females, 2 males
3rd Generation	28	San Andres	2 females, 3 males
1st Generation	61.5	Old Providence	3 females, 2 males
2nd Generation	43	Old Providence	3 females, 2 males
3rd Generation	26	Old Providence	2 females, 3 males

(and 8 Continental Spanish monolinguals).

THIS STUDY

FIRST ANALYSIS: NON-VIBRANT RHOTICS

Step 1. Recordings were trimmed by 15 minutes and submitted to Praat (Boersma and Weenik, 2005).

Step 2. By means of three Praat scripts (DiCanio et al, 2013; Kawahara, 2010; Lennes, 2002), three acoustic measurements were obtained automatically:

1. Segmental Duration

2. Formant Frequencies (F2, F3, F3-F2 Distance, F4, F5, F5-F4 Distance)

3. Spectral moments (Center of Gravity, Kurtosis, and Skewness)

Step 3. Data was submitted for analysis in SPSS (Discriminant Function Analysis) and R (R CoreTeam, 2013) for visualization and other statistical tests.

THIS STUDY

SECOND ANALYSIS: VIBRANT RHOTICS – TAPS/TRILLS (ONLY THE SPANISH VARIETIES)

Mixed effect model in Rbrul of the linguistic constraints conditioning tap and trill production in Raizal Spanish and Continental Spanish.

Variables	Categories	
Categorical		
Position in the word	Word-initial Complex onset Word-Final	Intervocalic Word-medial
Preceding segment	High vowel Mid vowel Low Vowel Pause	Liquid Sibilant Stop Nasal
Following segment	High vowel Mid vowel Low Vowel Pause	Liquid Sibilant Stop Nasal
Stress	Posttonic Tonic	Pretonic
Number of Syllables	Two- Three+	Three
Grammatical Category	Adjective Adverb Conjunction	Noun Preposition Verb
Continuous: F3 and Duration		
Random: Token and Informant		

Variables	Categories
Generation	First Second Third
Sex	Male Female
Education Level	Secondary Tertiary
Island of Dwelling	Old Providence San Andres
Occupation	Home Informal Employed Student
Speech style	Task Interview

RESEARCH QUESTIONS

R1. Is there a change in progress between non-vibrant rhotics across generations of Raizal Spanish speakers?

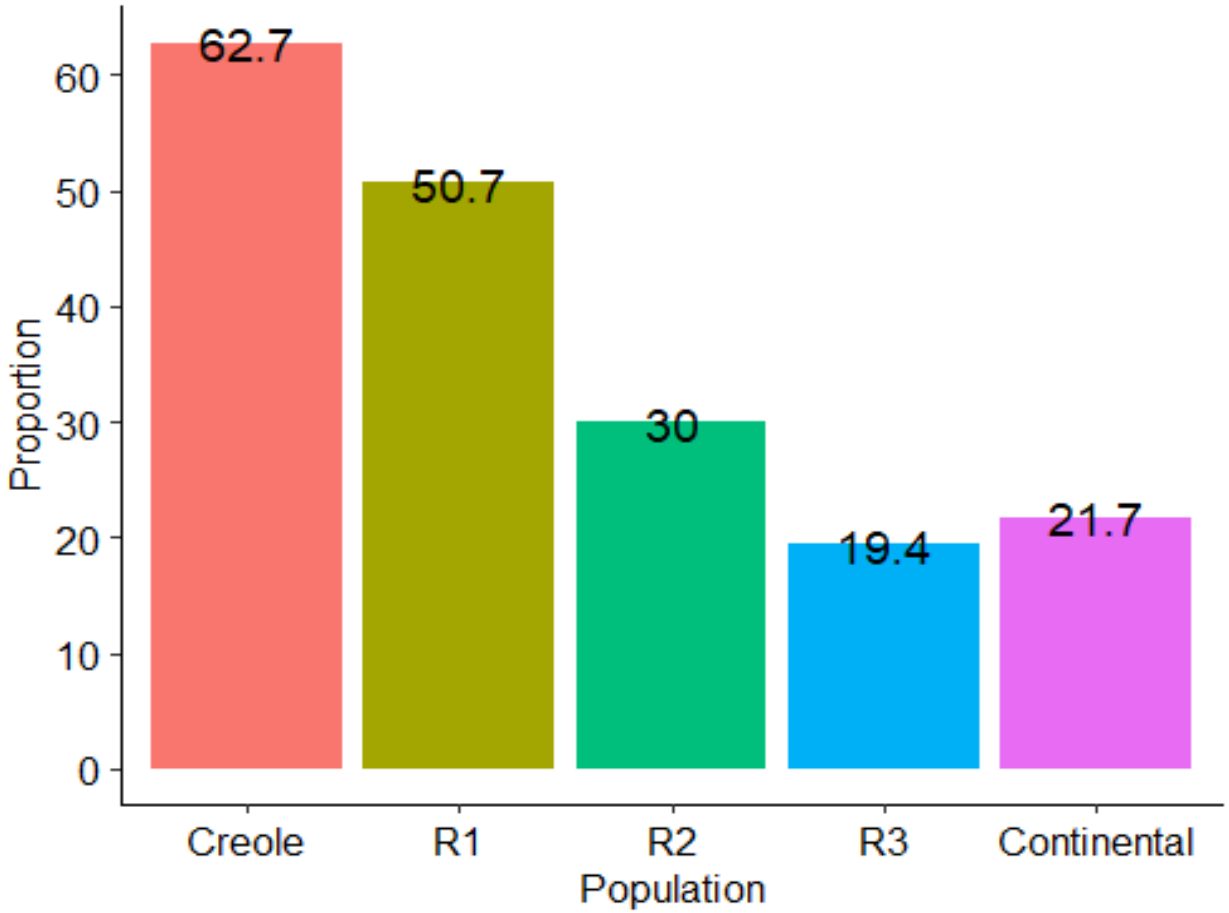
Hypothesis: Non-vibrant rhotics produced by senior Raizales will present more resemblance to Islander Creole than the other two adult and young generations, which in turn, will be converging toward Continental Spanish. This might be due to more balanced bilingualism in younger generations.

R2. Is speech variation spreading socially in the direction of Continental Spanish motivated by new generation of speakers?

Hypothesis: There will be a restructuring of the sociolinguistic constraints in tap and trill production in Raizal converging in the direction of Continental Spanish in younger Raizal generations.

THIS STUDY

DISTRIBUTION OF NON-VIBRANT RHOTICS IN THE VARIETIES OF THE ARCHIPELAGO.



NON-VIBRANT

IDENTIFYING THE PROPERTIES OF ISLANDER RHOTICS

NON-VIBRANT

Discriminant Function Analysis: determine the predictors that best discriminate between linguistic groups. For this analysis, non-vibrant rhotics in Continental Spanish, Raizal Spanish, and Raizal Creole were compared.

Structure Matrix

	Function	
	1	2
duration	**.778**	**.338**
F3	**-.687**	**.498**
F3-F2_distance	**-.461**	**.373**
F4-F5_distance	**.375**	**.225**
F2	**-.361**	**.209**
F5 mean	**.334**	.048
F4 mean	**-.143**	.052
COG	-.042	.350*
Skewness	.053	-.281*
Kurtosis	.050	-.223*

Classification Results[a,c]

			Predicted Group Membership			
		population	Creole	Raizal Sp.	Cont. Sp.	Total
Original	Count	Creole	237	82	9	328
		Raizal Sp.	258	850	342	1450
		Cont. Sp.	7	29	114	150
	%	Creole	72.3	25.0	2.7	100.0
		Raizal Sp.	17.8	58.6	23.6	100.0
		Cont. Sp.	4.7	19.3	76.0	100.0
Cross-validated[b]	Count	Creole	237	82	9	328
		Raizal Sp.	260	846	344	1450
		Cont. Sp.	7	30	113	150
	%	Creole	**72.3**	25.0	2.7	100.0
		Raizal Sp.	17.9	**58.3**	23.7	100.0
		Cont. Sp.	4.7	20.0	**75.3**	100.0

Best acoustic predictors

Predicting Capabilities

NON-VIBRANT

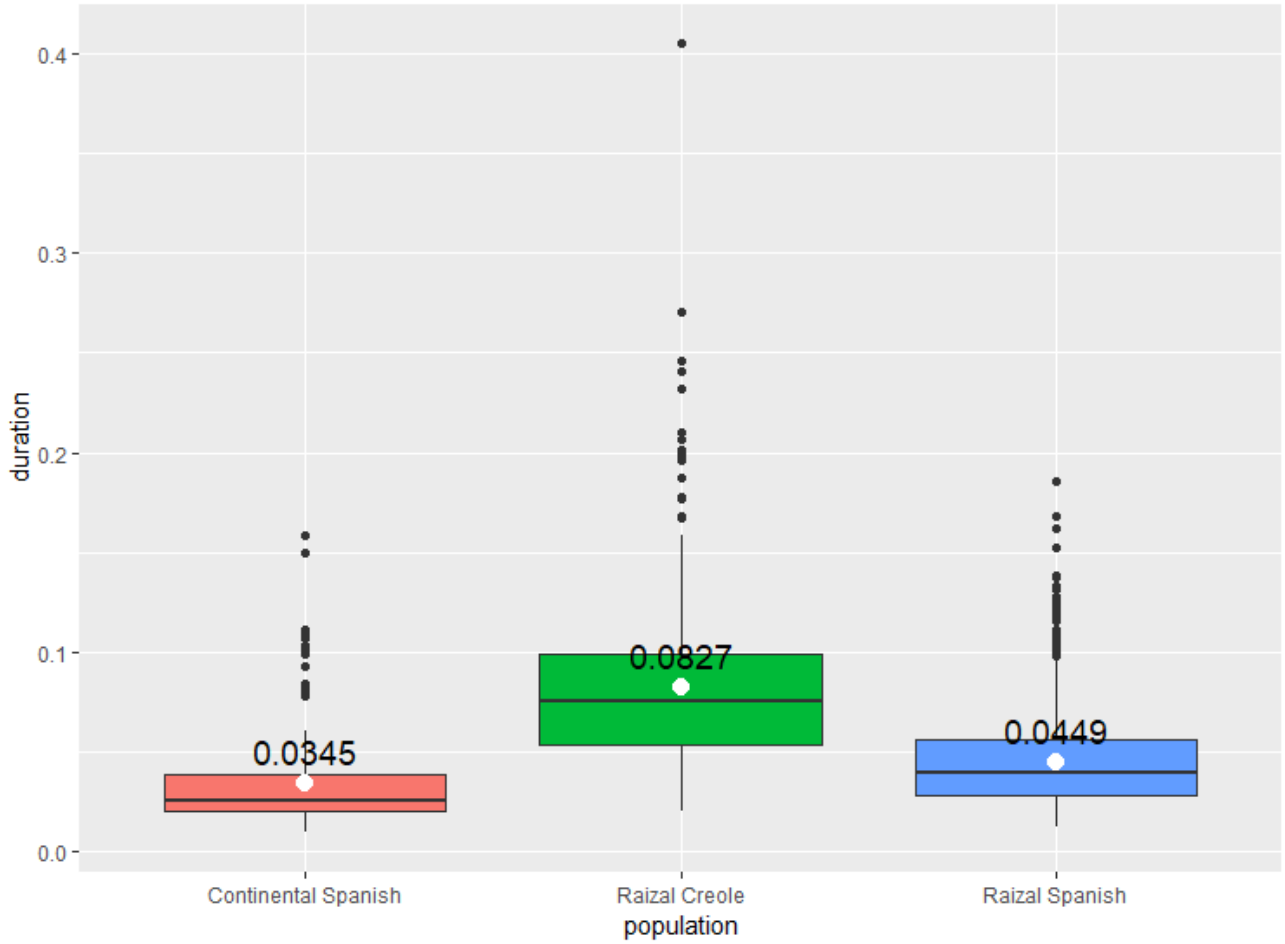
English Sibilants (Jongman et al, 2000)	COG	**Spanish Fricative Trill (Colantoni, 2006)**	COG	**Rhotics in the Archipelago**	COG
/f, v/	5108	[ř]	1300Hz - 5500HZ	/r/ Continental	861Hz
/s, z/	6133	--	--	/r/ Raizal Creole	777Hz
/ʃ, ʒ/	4239	--	--	/r/ Raizal Spanish	755Hz

Table 4.3 A comparison of COG values reported for English sibilants, Spanish fricative trills and the rhotics in the Archipelago.

English Sibilants (Jongman et al, 2000)	Skewness	**Spanish Fricative Trill (Colantoni, 2006)**	Skewness	**Rhotics in the Archipelago**	Skewness
/f, v/	0.077	[ř]	0.8 -5.8	/r/ Continental	11.84567
/s, z/	-0.229	--	--	/r/ Raizal Creole	13.61165
/ʃ, ʒ/	0.693	--	--	/r/ Raizal Spanish	14.45552

Table 4.4 A comparison of skewness values reported for English sibilants, Spanish fricative trills and the rhotics in the Archipelago.

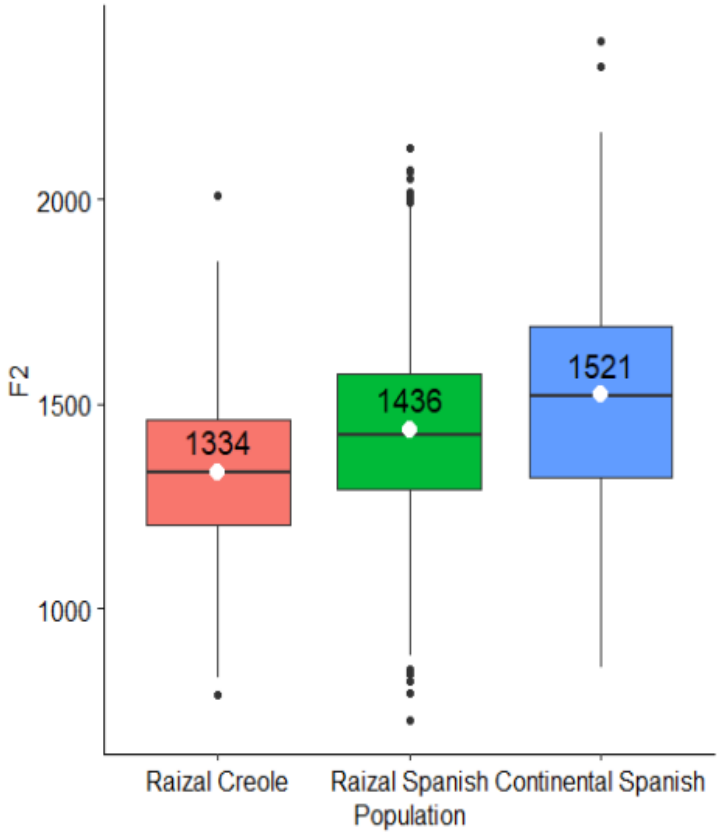
APPROXIMANT ISLANDER RHOTICS: DURATION (MS)

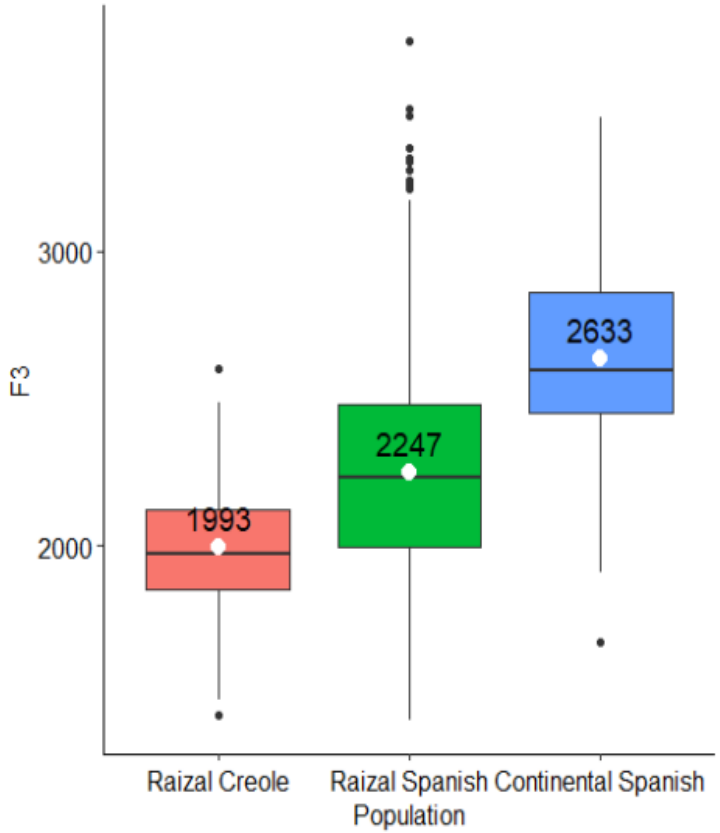


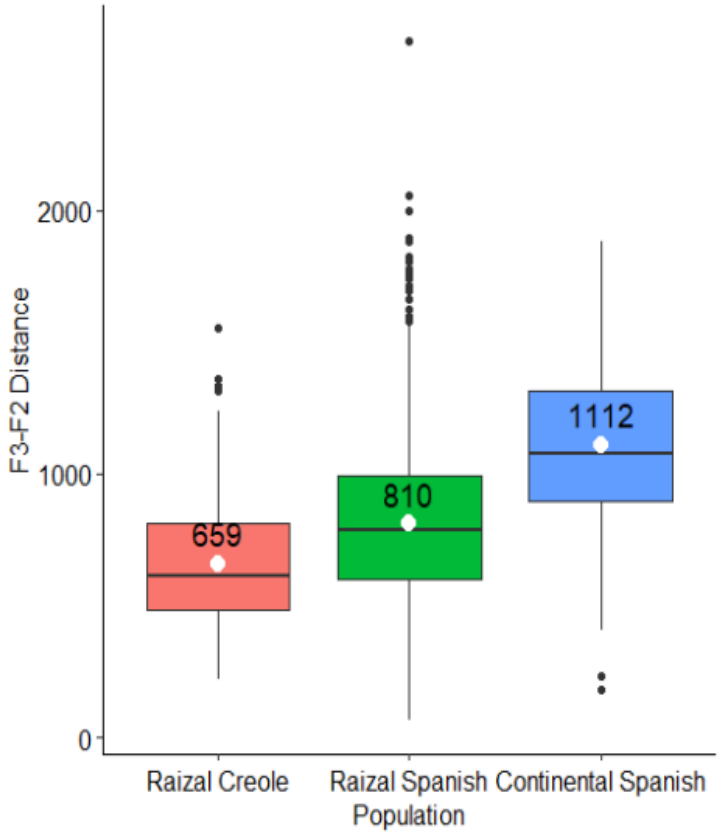
NON-VIBRANT

AND THE PLACE OF ARTICULATION? F2, F3, AND F3-F2 FREQUENCIES

NON-VIBRANT







F3 DIFFERENCES ACROSS GENERATIONS. INTERCEPT: F3 IN ISLANDER CREOLE

Random Variables Token and Informant	*Dependent variable:* F3 in Taps
Raizal – First Generation	Estimate: 213.27 ($p = 0.0102$) **
Raizal – Second Generation	Estimate: 278.31 ($p = 0.0014$) **
Raizal – Third Generation	Estimate: 368.63 ($p = 4.91e-05$) ***
Continental Spanish	Estimate: 595.41 ($p = 4.91e-05$) ***
Intercept	Estimate: 2,010.19
Observations	1,554
Log Likelihood	-10,828.06
Akaike Inf. Crit.	21,672.13
Bayesian Inf. Crit.	21,714.91
Note: *p = 0.05 **p = 0.01 ***p<0.01	

Random Variables Token and Informant	*Dependent variable:* F3 in Trills
Raizal – First Generation	Estimate: 201.39 ($p = \mathbf{0.06285}$)
Raizal – Second Generation	Estimate: 382.60 ($p = 0.00136$) **
Raizal – Third Generation	Estimate: 500.91 ($p = 4.34e-05$) ***
Continental Spanish	Estimate: 688.50 ($p = 4.41e-06$) ***
Intercept	2,009.12
Observations	702
Log Likelihood	-4,834.83
Akaike Inf. Crit.	9,685.66
Bayesian Inf. Crit.	9,722.09
Note: *p = 0.05 **p = 0.01 ***p<0.01	

NON-VIBRANT

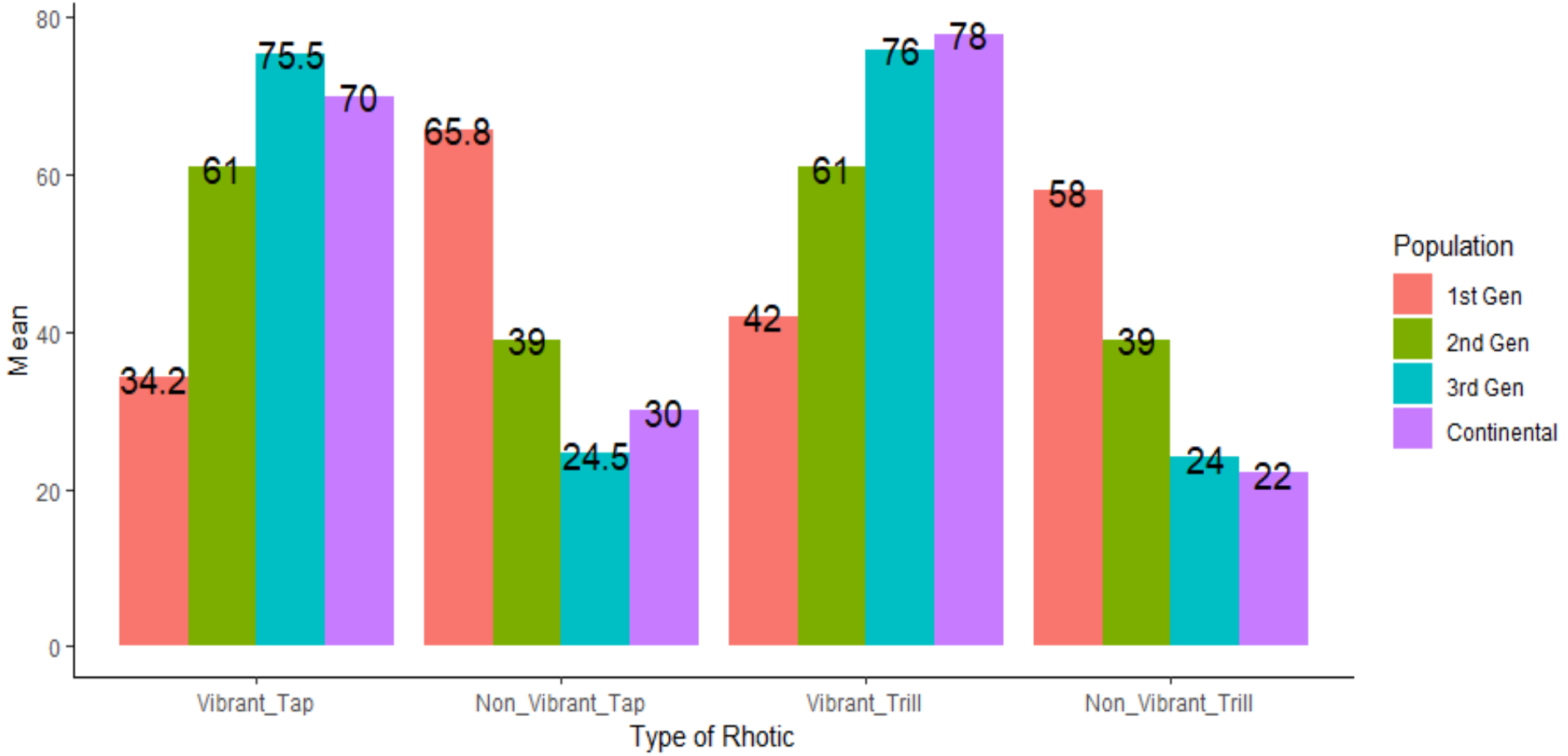
F3-F2 DIFFERENCES ACROSS GENERATIONS. INTERCEPT: F3-F2 IN ISLANDER CREOLE

Random Variables Token and Informant	*Dependent variable:* F3-F2 Distance in Taps
Raizal – First Generation	Estimate: 72.22 (p = **0.362130**)
Raizal – Second Generation	Estimate: 132.56 (p = **0.107456**)
Raizal – Third Generation	Estimate: 185.32 (p = 0.026419) *
Continental Spanish	Estimate: 399.01 (p = 0.000135) ***
Intercept	Estimate: 695.14
Observations	1,554
Log Likelihood	-10,791.52
Akaike Inf. Crit.	21,599.04
Bayesian Inf. Crit.	21,641.83
Note:	*p = 0.05 **p = 0.01 ***p<0.01

Random Variables Token and Informant	*Dependent variable:* F3-F2 Distance in Trills
Raizal – First Generation	Estimate: 72.69 (p = **0.499553**)
Raizal – Second Generation	Estimate: 255.85 (p = 0.028260) *
Raizal – Third Generation	Estimate: 379.97 (p = 0.001614) ***
Continental Spanish	Estimate: 557.55 (p = 0.000164) ***
Intercept	Estimate: 696.91
Observations	702
Log Likelihood	-4,852.91
Akaike Inf. Crit.	9,721.81
Bayesian Inf. Crit.	9,758.24
Note:	*p = 0.05 **p = 0.01 ***p<0.01

NON-VIBRANT

DISTRIBUTION OF VIBRANT TAPS AND TRILLS IN RAIZAL SPANISH



VIBRANT

VIBRANT TAPS

Factor Group	Relative Frequency Vibrant				Probability			
	1st Gen	2nd Gen	3rd Gen	Cont.	1st Gen	2nd Gen	3rd Gen	Cont.
Word Position								
Final	37	78	83	60	.63	.64	.63	[.41] **
Medial	21	71	88	59	.39	.58	.66	[.41]
Intervocalic	46	63	75	71	.65	.45	.42	[.56]
Complex	17	42	65	75	.32	.32	.29	[.60]
Range					*33*	*32*	*37*	*19*
F3								
Log odds	.00294	.00246	.0025	.00106				
Duration								
Log odds	[-3.653]	43.684	[12.688]	3.875				

Factor Group	1st Gen	2nd Gen	3rd Gen	Cont.
Word Position				
Final	√	√	√	⊗
Medial	⊗	√	√	⊗
Intervocalic	√	⊗	⊗	√
Complex	⊗	⊗	⊗	√
F3				
Log odds	+	+	+	+
Duration				
Log odds	-	+	+	+

Factor Group	Relative Frequency Vibrant				Probability			
	1st Gen	2nd Gen	3rd Gen	Cont.	1st Gen	2nd Gen	3rd Gen	Cont.
Preceding Segment								
Vowel	47	66	81	80	.77	.75	.69	[.59]*
Consonant	14	36	53	64	.23	.25	.31	[.41]
Range					*54*	*50*	*38*	*18*
Grammatical Category								
Noun	46	70	77	78	.62	[.55]	[.54]	[.56]
Other	35	59	73	77	.38	[.45]	[.46]	[.44]
Range					*24*	*11*	*9*	*12*
Number of Syllables								
Three+	42	56	78	67	[.51]	[.46]	[.54]	.36
Two-	41	65	73	90	[.49]	[.54]	[.46]	.64
Range					*2*	*12*	*8*	*28*
F3								
Log odds	.00252	.0013	[.00111]	-.00224				
Duration								
Log odds	[-15.127]	20.639	[-4.089]	14.754				

Factor Group	1st Gen	2nd Gen	3rd Gen	Cont.
Preceding Segment				
Vowel	√ →	√ →	√ →	√
Consonant	⊗	⊗	⊗	⊗
Grammatical Category				
Noun	√ →	√ →	√ →	√
Other	⊗	⊗	⊗	⊗
Number of Syllables				
Three+	√ ↘	⊗ ↗	√ ↘	⊗
Two-	⊗	√	⊗	√
F3				
Log odds	+	+	+	-
Duration				
Log odds	-	+	-	+

VIBRANT TRILLS

DISCUSSION OF THE RESULTS

R1. Is there a change in progress between non-vibrant rhotics across generations of Raizal Spanish speakers?

- A Discriminant Function Analysis has shown that Duration, F3, F3-F2 Distance, and F5-F4 Distance best discriminate between Islander and Spanish. Since no spectral moments are correlated with any rhotic realization, no assibiliated production was found.

- Based on these findings, it has been determined that Islander Creole produces a postalveolar approximant and Continental Spanish an alveolar approximant.

- Formant frequencies in non-vibrant rhotics across generations of Raizales are associated with either Raizal Creole or Continental Spanish:
  - Approximant rhotics in older generations appear with a place of articulation that increasingly converges in the direction of Islander post-alveolar approximants.
  - Younger generations are converging in the direction of Continental Spanish alveolar approximants.

DISCUSSION OF THE RESULTS

R2. Is speech variation spreading socially in the direction of Continental Spanish motivated by new generation of speakers?

- Although the distributional frequency of vibrant rhotics is converging toward the monolingual variety, the nature of tap and trill variation diverges with the behavior of taps and trills in the monolingual variety.
- Lack of shared significant factor groups and constraint hierarchy seems to corroborate the interplay of internal linguistic mechanisms in tap/trill production.
- There seems to be an Implausible connection between these Spanish varieties.

DISCUSSION

CONCLUSION

- This is the first time that it has been confirmed by quantitative acoustic methods the manner and place of articulation of the rhotics of the Archipelago.

- The evidence on non-vibrant rhotic variation points toward a “reversed” language change accelerated by contact with Spanish.

- Vibrant realizations are the result of generational continuity arisen through community-internal transmission.

- Non-rhoticity has also been found in the data and further studies should focus on the sociolinguistic variation of this phenomenon.

ACKNOWLEDGEMENTS

UF | Spanish and Portuguese Studies
College *of* Liberal Arts and Sciences

UF | Center for Latin American Studies
UNIVERSITY *of* FLORIDA

UF | Department *of* Linguistics
College *of* Liberal Arts and Sciences

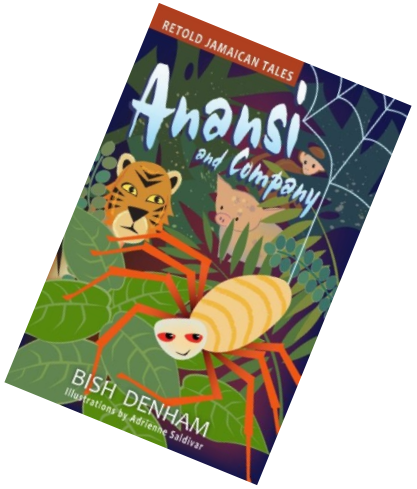
Special thanks to:

- The wonderful people of the Archipelago of San Andres
- To my dissertation committee:
  - Dr. Jessi Aaron
  - Dr. Gillian Lord
  - Dr. Valdes-Kroff
  - Dr. Essegbey
- Special thanks to advising professors:
  - Dr. Stefanie Wulff
  - Dr. Andrew Lotto
  - Dr. Aaron Broadwell

Falcon Restrepo-Ramos, PhD Candidate
Dept. of Spanish and Portuguese Studies, University of Florida
frestrepo@ufl.edu

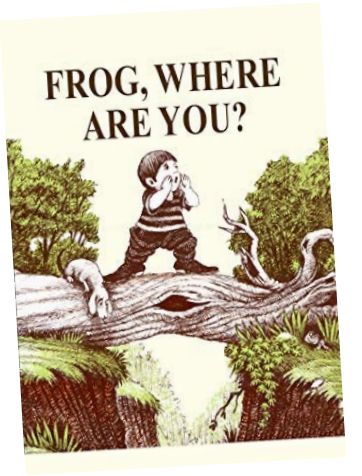
[1]ELICITATION TASKS

- Raizal female (66) telling a Anansy story (the trickster spider)



- Interaction task between two adult Raizales

- Raizal female (34) narrating the picture book A Frogstory (Mercer, 1969)



THIS STUDY