

/r/ You The(re)?
Analyzing Rhoticity in the *Linguistic Atlas of the Gulf States*

Rachel M. Olsen and Margaret E. L. Renwick

Rhoticity is a socially significant linguistic marker, with variation in post-vocalic /r/ realization well-documented along geographic, socioeconomic, ethnic, age, and gender lines (Labov 2006; Labov, Ash & Boberg 2006; Schönweitz 2001). While many sociolinguistic studies rely on impressionistic analysis of rhoticity where /r/ is marked as present or absent, the reality of /r/ production is more complicated in that /r/ may be weakened, but not deleted, and it may be variably realized even by a single speaker. This study details methods for acoustic analysis and quantification of gradient post-vocalic /r/ realization, and hypothesizes that there will be individual and intradialectal variation within the speech sample examined. The focus here is the Southern U.S. English dialect, which is widely described as historically non-rhotic, although this feature dissipated over the course of the 20th century, and is only reported to remain today in certain Southern dialects (Dorrill 2003; Feagin 2003; Thomas 2008).

The data is speech from the *Linguistic Atlas of the Gulf States (LAGS)*, an extensive sociolinguistic audio corpus of interviews with 1121 speakers recorded from 1968-1983 across eight U.S. Gulf states (Pederson, McDaniel & Adams 1986). Non-rhoticity is expected as many speakers interviewed were born ~1900. The initial purpose of LAGS was to document lexical variation by eliciting and transcribing target items. However, these were collected in the context of conversational interviews totaling ~5300 hours (Montgomery & Nunnally 1998) that are untranscribed; thus a wealth of phonetic information remains to be analyzed. To capture the full extent of variation, this study uses complete audio interviews, specifically from one LAGS speaker area of five contiguous counties in southeast Georgia (~36 hours) produced between 1969-1979 by 10 speakers (5M; mean=63.7 years). 508 tokens of vowel+/r/ (e.g. /air/ wire, /ier/ year, /or/ porch), and /r/-colored vowel (e.g. /er/ church), were annotated for segmental quality in Praat (Boersma & Weenink 2015). F1, F2, F3 values were automatically extracted at 10% intervals, and trajectories plotted over time.

In the acoustic signal, rhoticity appears as an F3 drop in vowel+/r/ (Ladefoged 2003), or as overall lowered F3 in /r/-colored vowels (Mielke 2013). To examine F3 in vowel+/r/, F3 slope was calculated using intra-token F3 values measured at 20% and 80% intervals, as well as methods of Functional Data Analysis, which can describe curves using polynomial coefficients (Ramsay, Hooker & Graves 2009) (non-rhotic=smaller slope). For /er/, midpoint F3 values of /er/ and /wedge/ (e.g. stuff) were compared using Pillai scores (Hall-Lew 2010). When the formant values of two vowels (here, F3 of /er/ wedge/) are modeled by this method, low Pillai scores indicates high overlap (non-rhoticity of /er/), while high Pillai scores indicates distinct distributions (rhoticity). In /er or/, 4 females showed the most rhoticity, with the least rhotic female being older and African American, which is consistent with previous research (Schönweitz 2001; Thomas 2008); however this pattern was not evident for /ier air/. The impact of additional demographic factors is also explored. Findings indicate that rhoticity is variable even within this small region of the South.

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