Studies of substratal effects in the formation of new language varieties have seldom combined both acoustic sophistication and the examination of a broad suite of pronunciation features. This study provides an example of how such work can be conducted. The study focuses on Pearsall, Texas, a community in southern Texas in which Mexican Americans have formed an established community for four generations and exhibit a shift from Spanish dominance to English dominance. A variety of segmental and prosodic variables are examined, both for different generations of Mexican Americans and for Anglo speakers of the contact dialect, and the variables are compared statistically. Results show that some Spanish interference features are discarded, while others take on a life of their own as markers of Mexican American identity.