Spanish and French stop-liquid (SL) clusters display an asymmetric pattern of simplification conditioned by liquid type and stop voicing. A recent study (Colantoni & Steele, to appear) has shown that stop-rhotic clusters are variably broken up by an epenthetic vowel in both languages, whereas stop-lateral clusters are not. Moreover, voicing-based asymmetries are observed in stop-rhotic clusters. In Spanish, the epenthetic vowel is significantly longer when preceded by a voiced stop; in French, epenthesis is restricted to this environment. Indeed, when preceded by a voiceless stop, devoicing of the rhotic ensues leading to affrication in dorsal clusters. In summary, SL clusters can be simplified either via assimilation or dissimilation. What remains to be understood is what determines the strategy selected including the role played by voicing.

This paper seeks to motivate and formalize this variation within Optimality Theory as competition between Faithfulness and Markedness constraints. We propose that two factors are at play. First, we argue that the strategy adopted for cluster simplification is determined by the degree of similarity in voicing and manner of the members of the clusters as well as universal markedness constraints on voicing. In particular, if the liquid is high in sonority and thus differs greatly from the preceding stop, voicing will be maintained and little cluster simplification will occur. In contrast, if the liquid is doubly marked as with French [r] (i.e. voicing is marked both in fricatives and dorsals), a higher rate of simplification is expected. Laterals, being acoustically similar to vowels and consequently the optimal sonorants in both languages, should involve the least simplification. Second, we propose that the length asymmetry in the Spanish epenthetic vowel is directly related to asymmetries in the phonetic realization of stops; voiceless stops are longer than their voiced counterparts. As such, we predict compensatory lengthening effects for all [+continuant] segments. This would be consistent with previous observations of length compensation in French consonant-vowel sequences (Fischer-Jørgensen, 1968).

In order to test these hypotheses, a reading-task experiment was conducted with 10 speakers each of Argentine and Chilean Spanish, and Quebec and European French. The stimuli consisted of 48 target-words, controlled for liquid type and contextual effects, as well as 27 distractors. Both targets and distractors were embedded in a carrier sentence and read three times. For each of the 5760 tokens elicited, three parameters were measured: (i) stop and liquid duration; (ii) percentage of the segment voiced; and (iii) duration of the epenthetic vowel, when present.

The results obtained confirm the first hypothesis. Cluster simplification was a function of voicing and manner of the liquid. When the rhotic was realized as a tap, as in Argentine Spanish, clusters were simplified via quasi-categorical epenthesis. When <r> was realized as a fricative, as for the majority of the French speakers, a voicing asymmetry surfaced: (i) in voiceless clusters, the rhotic often assimilated to the preceding consonant, leading to an affricate in dorsal clusters; (ii) in voiced clusters, epenthesis was the most frequent strategy, as previously reported. When the rhotic was realized as an approximant, as with some of the Quebec French speakers, it patterned with /l/, which involved no epenthesis. The second prediction was also borne out with compensatory length-effects being observed for all [+continuant] segments (i.e. laterals, approximant and fricative rhotics). This synchronic variation favouring shortening in voiceless environments mirrors a diachronic simplification observed in the evolution of voiceless obstruent-liquid clusters from Latin to Spanish (Lloyd, 1993; Penny, 2002).

We formalize the interactions observed as competition between Faithfulness and Markedness constraints. For example, epenthesis is favored in voiced-rhotic clusters in French where Faithfulness constraints on voicing and manner to both members of the cluster outrank the epenthesis constraint (DEP-IO). In voiceless clusters, the tendency towards assimilation is driven by head faithfulness. In order to respect voicelessness in the stop, i.e. the head, and not violate the markedness constraint against differential voicing in obstruent clusters (e.g. AGREE), assimilation ensues.
References


