The only instance of quantity differences in Spanish is the tap/trill rhotic contrast, which is found only in word-internal intervocalic position, as in *caro* ‘expensive’ vs. *carro* ‘cart’. On the other hand, sequences of identical consonants or ‘syntactic geminates’ may arise by word concatenation as in *come nueces* ‘s/he eat walnuts’ vs *comen nueces* ‘they eat walnuts’. A question that arises is to what extent consonant length can be used to convey differences in meaning reliably in a language without word internal geminates. The possibility of such a contrast would seem particularly questionable in the case of sequences of rhotics, as in *parti rocas* ‘I broke up rocks’ vs *partir rocas* ‘to break up rocks’, since, as mentioned, word-initial rhotics are trills or intrinsically long. In fact, for the rhotics, it has been claimed that there is no possible contrast of this type, so that examples like those just mentioned would always be ambiguous (Harris 1983, Quilis 1993).

In a small production experiment, Hualde (2004) found, nevertheless, a statistically significant difference between single consonants and sequences of identical consonants across word boundaries, even in the case of the rhotics. The question of whether differences in meaning can be reliably perceived remains standing.

We asked 11 native speakers of Spanish from Valencia, Spain to identify auditorily-presented recorded stimuli like those given above by pressing one of two buttons on a computer keyboard. For each consonant 20 stimuli were presented. Both numbers of errors and reaction times were measured. The results show that listeners identified the intended meaning with better than chance accuracy. Percentage of correct responses are presented in Fig 1. The consonants */n/*, */r/ and */s/* were chosen for the test because they can be inflectional suffixes, paradigmatically contrasting with their absence and thus giving rise to minimally contrasting utterances. Listeners were very accurate in the perception of the */n/* vs */n-n/* contrast (96% correct). For */r/* (71%), */r-r/* (71%) and */s-s/* (78%) accuracy was lower but still high. On the other hand */s-s/* was correctly perceived only 57% of the time. Reaction times were also significantly longer for */s/* and */s-s/* than for the other consonants, see Fig. 2.

As shown in Fig. 3 For */n/-/nn/* we find a near-categorical shift both in production and in perception between singleton and geminate at about 60 ms of duration. For both */s/-*/ss/* and */r/-*/rr/*, on the other hand, we find much greater overlap in our production tokens and also much lower accuracy in perception with a very gradual shift in perception depending on the duration of the token.

We conclude that the singleton vs ‘syntactic geminate’ contrast can be used in Spanish to convey meaning, although more reliably with some consonants, such as the nasals, than with others. Interestingly, we found that the contrast may be more reliable with the rhotics than with the fricatives, in spite of previous claims and of the fact that word-initial rhotics are trilled.
Figure 1. Percentage of correct identifications

Figure 2. Reaction Times (seconds) for each of the segments.

Figure 3. Percentage accuracy for each stimulus plotted against duration of the phoneme. Black indicates intended singleton production, while blue indicates intended geminate production. Circles = /n/, triangle = /r/, box = /s/