This talk focuses on the status of plural /s/ in Occitan, a Romance language of Southern France. Like many other Romance languages, Occitan marks plurality on a noun phrase by affixing /s/-deletion and the preservation of plurality in Modern Occitan

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an /s/ plural morpheme to the article, the noun, and any adjectives. However, again like many other Romance languages, such as Spanish and Portuguese, this /s/ is currently undergoing weakening and deletion. So, I'll be examining what happens to the singular/plural distinction when /s/ weakens: does the distinction on the noun phrase collapse? Or is it preserved by some other mechanism?

I'll start by providing some background information on the language under study. Occitan is a collection of dialects spoken in Southern France,
This language has also been referred to historically by the names Provençal and Langue d'Oc, with this latter term being used to distinguish the language of Southern France, Langue d'Oc, from the language of northern France, Langue d'Oil. Both names make reference to the medieval language's word for “yes,” “oc” and “oil” respectively. I'll be focusing in particular on the Lengadocian dialect.

Occitan and French are both members of the Gallo-Romance branch of Romance languages; however, the two followed different paths of development beginning in the 5th century with the invasion of Gaul by foreign tribes. Northern France sustained invasions by Britons, Saxons, and particularly Franks, who lent their name to the nation, while Southwest France, with the exception of Gascony, which was invaded by the Basques, received minimal outside influence. There was an invasion of Visigoths, in the 5th century, but they were small in number and did not intermarry with the Gallo-Romans. Roman language and culture thus remained more intact in Southern than Northern France, given the differing levels of occupation in each half of the country, and by the 12th century, the vernaculars of Northern and Southern France were considered different languages.

Anglade (1921) places the number of speakers of Occitan at 12 or 14 million; the 1999 French census found only 610,000 speakers of the language but another million who had some familiarity with it. UNESCO puts the number of speakers of Lengadocian specifically at roughly 500,000.

The data I'm using in this study come from the linguistic and ethnographic atlas of
that outlined in red on this map, situated between two rivers: the Dordogne to the north, and the Garonne to the west. It includes the major city of Toulouse but not that of Bordeaux. The northern border of the region sampled is the southern limit of palatalization of /k, g/ before /a/ -- so speakers in this region say [kat] or [gat] for cat, as opposed to [shat] to the north. The atlas-makers also considered topographical, historical, and ethnographic divisions when determining the boundaries of the region.

Data were gathered between 1967 and 1972, collected from
131 localities within the Atlas borders, as plotted here. The points are 15–17 km apart. Approximately 1200 lexical items were elicited for the atlas, one token per town of each lexical item. So the 1200 lexical items are each represented 131 times. Most informants were 60–70 year-old farmers; to elicit forms, researchers would give an informant a French word and ask for the Occitan translation, so we can assume that all informants had some level of bilingualism. The data was collected by semantic category with little focus on phonology or, for instance, collection of minimal pairs.
For this talk, I'll be focusing on the manifestation of /s/ in feminine plural noun phrases only. Of the 1186 lexical items in the atlas, only 45 were plural noun phrases that included an article. Of those 45, only 19 were homogeneous throughout the region with regards to gender. Finally, of those 19, I selected 8 to examine for this talk, for all of which the noun started with a voiceless stop, because initial voiced stops and fricatives induced a little variation in the preceding article that I don't have time to talk about. A sample word of the 8 I looked at is 'las pe[z]ados,' meaning animal tracks – I'll be using this form throughout the talk to exemplify patterns that are common across all the lexical items I examined. As a side note, there is a great deal of variation in the manifestation of this noun across the region – from pezados to penachados to penados to pyados – I just picked the best-represented variant to be the citation form.
For a little history on /s/-loss in Gallo-Romance, we can take a look at the history of /s/ plurals in Northern French, or Langue d’oil. Like Occitan, as well as Spanish and Portuguese, Northern French historically marked plurals by affixing /s/ to all elements of an NP, so, the article, the noun, and any adjectives. Old French had two cases, a nominative and an oblique; the oblique declension was what survived into Modern French, and made the singular/plural distinction by affixing /s/ to articles and nouns in the plural. So Old French singulars le mur 'the wall' and la rosa 'the flower' had as their corresponding plurals les murs and les rosas. Preconsonantal /s/ was lost by the 12th or 13th century, and /s/ before pause by the 17th century, which leads us to the system French has today,
in which singular 'le mur' and 'la rose' have as their corresponding plurals the forms 'les mur' and 'les rose' – forms with an orthographic but silent /s/. Plurality is instead conveyed by another mechanism: change of the definite article from le or la to les. The only place where /s/ still manifests itself is in the process of liaison before a vowel: for instance, the vowel-initial noun 'l'heure' has as its plural les heures. With the exception of vowel-initial forms, then, plurality is expressed by the vowel of the definite article.

There's some uncertainty in the literature regarding the source of this unique [e] in plural articles. Seklaoui (1989) refers to it as the result of “an obscure sound change”; while Spence (1976) proposes the following developmental trajectory:
the vowels of the Vulgar Latin articles los in the masculine and las in the feminine were reduced to schwa, which was then variably lengthened compensatorily after the loss of following /s/, and this long schwa raised to [e]. He admits that there's no clear phonetic mechanism by which this could have occurred, and concedes that the need to disambiguate singular from plural must have been an influencing factor. In this talk, I propose that the patterns I find in the closely-related language of Occitan may elucidate the question.

This is not the first study of /s/-deletion and its effects on plurality in Modern Occitan. Eckert (1969, 1985) performed a similar study, using data she collected from the Atlas Linguistique de la France, or ALF, for which fieldwork was carried out between 1897 and 1901. She found in the region of /s/-deletion a concomitant change of

\[ *\text{los, las} \rightarrow \text{l[ə]s} \rightarrow \text{l[ə]} \sim \text{l[ə:]} \rightarrow \text{l[e]} \]
*a > [o]

/s/ > Ø, *a > [o] in plurals only

sg. la bella pulla ~ pl. lo bello pullo 'the beautiful hen(s)'

/s/ > s, *a > [o] in plurals & singulars

sg. la bello pullo ~ pl. las bellos pullos 'the beautiful hen(s)'

*a > o*, which interacted with weakening /s/ as follows: in areas where /s/ had been fully deleted, the *a > [o] change had gone to completion in plurals only, giving us a minimal pair such as singular la bella pulla and plural lo bello pullo. On the other hand, in the area of /s/ retention, the change went to completion in plurals and singulars, giving us la bello pullo and las bellos pullos. In other words, where plurality was in danger of being lost due to /s/-deletion, this simultaneous *a > o change stepped in and effectively preserved the distinction.

The data I examined in ALLOc were collected 70 years after Eckert’s ALF data, and I find that /s/-deletion has continued to spread, even in those areas where the *a > o change went to completion in both singulars and plurals. So the question is, how has plurality been preserved without this “recourse”? 
Before we take a look at the data, I'd like to briefly present the most common manifestations of /s/ we'll be seeing, which I've color-coded to match the colors on the dialect maps we'll see in a second. /s/ can take the following four manifestations: total retention, which I'm coloring as red, and for which I've lumped together all fricatives with a buccal articulation, so s, sh, and x;---if this is a concern to you, you should know that sh and x are quite rare throughout the area studied: sh appears on only two of the 131 points examined, and x appears only on articles that precede a k-initial noun, so that's clearly just a case of assimilation of /s/. aspiration of s to h, which will be green; vocalization or “iotacism” of s to j, which will be yellow; and total deletion of s, which will be blue.

Just as a quick note about vocalization as a stage in the loss of s: it's not attested in Ferguson (1990)'s typology of s > h changes, not mentioned as a variant in studies of synchronic s-weakening in Spanish and Portuguese, and Seklaoui (1989) gives Occitan as the only Romance language in which it is well-attested, so it's typologically pretty rare.

I'm going to walk through the s-deletion patterns that we see, first on the noun, then on the article. The questions we'll be looking at are whether geography can tell us about the history of this change, and whether there's any apparent tendency to preserve meaning.

**Retention:** *s > [s,ʃ, x]
**Aspiration:** *s > [h]
**Vocalization (“Iotacism”):** *s > [j]
**Deletion:** *s > ∅
This map shows the manifestation of /s/ on the noun 'pezados' in the noun phrase 'las pezados,' animal tracks. The plot has one point for each of the 131 localities surveyed in ALLOc; black points indicate a location where the data was not usable for this study because the informant provided a masculine form or a collective singular form. But the data groups very cleanly: the south and central regions display complete retention of /s/; the northeast displays vocalization to [j]; and the northwest total deletion.

To show that these patterns are not specific to this one lexical item, I calculated the percentage of each variant of /s/ for each locality across all 8 of the lexical items I examined and plotted the percentage of the most frequent variant by locality on
this map, where darker, more saturated colors mean that the variant indicated surfaced in ¾ or more of the 8 lexical items examined. You can see that for all but a few border towns, the pattern from the single lexical item 'las pezados' is very clearly repeated over the other lexical items. So
taking the map of 'las pezados' which we just saw as representative for noun-final s, and assuming the progression $s > j > \emptyset$, it looks like s-weakening begins in the northwest and is progressing south- and eastward. Now we'll take a look at the manifestation of s on the article.
This map shows the manifestation of /s/ on the article 'las' in the phrase 'las pezados.' Once again, we see a good deal of retention in the south/central part of the region; this time, we see aspiration in the northeast, where we saw vocalization on the noun; we see vocalization in the northwest, where we saw deletion on the noun; and there are a few isolated points of deletion and gemination, but not enough to form coherent dialect regions.

Once again, I tabulated the frequency of each variant for each locality across the 8 lexical items and plotted the most frequent variant per locality on
this map, with the darkness of the color indicating how well-represented that variant was, and the darkest shade of each color indicating that that variant appeared in at least 80% of the lexical items examined for that locality. There's more variation in the manifestation of /s/ on the article than we saw for /s/ on the noun—that is, more light colors—which is almost certainly due to phonological conditioning by the nature of the following segment, that I wasn't able to factor out, and that didn't come into play when we looked at /s/ on the noun, which was phrase-final. But even despite these occasional fluctuations, the pattern of 'las pezados' is still clearly repeated across the other lexical items I examined.
Again, we can take the map of 'las pezados' as representative of what happens to /s/ on the article, and assuming that /s/-lenition is traveling in the same direction as we saw on the noun, we can assume the progression s to h to j. Note that s-lenition is not as advanced on the article as it was on the noun – there's no deletion – the conservativeness of determiners is a result that's been found in other studies of s-weakening in Romance, such as Cedergren (1973) and Poplack (1979).
Most common noun /s/ variants: [s], [j], [Ø]
Most common article /s/ variants: [s], [h], [j]

➡️ Which variants overlap geographically?
➡️ What happens to plurality in areas of advanced weakening?

So just to review what we've seen so far: /s/ manifests on the noun as s, j, Ø; /s/ manifests on the article as s, h, j. The next two questions to answer are which variants overlap geographically and what happens to plurality in areas of advanced weakening.
In order to better visualize the data that will help us answer these questions, I devised a combined weakening score for each point studied, which, assuming
the progression $s > h > j > \text{gem} > \emptyset$, assigned each of the two manifestations of /s/ in a noun phrase more points the closer it was to the retention end of the scale. This allowed me to capture the weakening of /s/ on both the article and the noun in a single metric. I've plotted these results on
this map, where black indicates a high degree of retention on the article and the noun, and lighter grays all the way to white indicate a high degree of lenition. The highest degree of article/noun weakening is, as we've seen, in the northwest corner. However, this isn't the whole story, there's one more variable to examine, which is the quality of the vowel of the plural definite article. I want to first start by examining the quality of the singular definite article in this region
which is plotted here – there's a sharp division between lo in the northeast and la in the rest of the area, which is indicated on this and subsequent plots by this black dividing line. Now, assuming that the vowel is the same in the plural article as it is in the singular article, which I'm taking here as a null hypothesis, as this is what happens in languages like Spanish and Portuguese, and combining that with what we've already seen about the manifestation of /s/ on articles, we can predict how the article should look for each region:
above the o/a dividing line, where /h/ has aspirated, we expect 'loh'; below the o/a line, we expect 'las' in the area of retention, 'lah' in the area of aspiration, and 'laj' in the area of vocalization. Interestingly, this is not entirely what we see.
On this map, I've added colored isoglosses indicating the observed quality of the article vowel for 'las pezados'. Above the black line, we mostly see 'loh' as expected; below it, we see 'las' and 'lah'; however; in the northwest, we actually see lej, rather than the expected laj – in other words, it looks like the following [j] has raised the vowel of the article to e. And if we superimpose these vowel quality isoglosses on the map of combined weakening scores from before,
we see that the area where the article has raised to [e] also has the most advanced weakening of the region.

So just as an overview: despite the fact that areas such asloh pesadoØ and loh pesadoj have a considerable degree of weakening on the article and the noun, there's been no concomitant vowel change – so vowels aren't just changing to [e] wherever the loss of plurality is imminent. The article vowel instead changes to e when followed by j, which has the effect of preserving the singular–plural distinction through a mechanism other than /s/, but looks to be a mechanical process.
- Labov (1994:596) on the “maintenance of meaning”:
  “When an element of the system is found to cooccur frequently with the signal being deleted, it is increasingly eligible to assume the distinctive feature representing the semantic feature in question.”
- Where /s/-weakening in Occitan is most advanced, a raised article vowel (due to coarticulation with [j]) is taking over plurality.

What’s going on looks to be what Labov talks about in ch. 20 of his 1994 book: [read] This applies quite nicely to what’s going on with plurals in Occitan, because [read]. If Northern French happened to have gone through a stage of /s/-vocalization before deletion, that could explain the provenance of the mysterious plural article vowel /e/.

It’s interesting to compare what’s going on in lexical items like las pezados—where e has apparently taken over plurality in the area with the most advanced weakening—with one of those forms that I told you earlier I was going to throw out for this analysis, such as one in which the noun starts with a fricative. For instance,
take this form 'las kanos', which refers to impurities that surface on wine: the manifestation of /s/ on the noun is exactly what we saw before, with retention in the south & central, vocalization in the northeast, and deletion in the northwest, no surprise there;
but when we take a look at /s/ on the article, while we see aspiration in the northeast and vocalization in the northwest as we saw before, we also see a lot of vocalization in the article in the normally very conservative south, which is unusual. This ends up being
a completely phonologically conditioned effect: vocalization of /s/ on the article in the south shows up only where the following noun is some fricative-initial form, like 'fluretos' or 'flus,' indicated here with the dark green outline. But
unlike what we saw and continue to see in the northwest, where a following j raises the article vowel to e, no such thing occurs in this southern area of article vocalization, which may be because /s/ is still completely present on the noun there. Where plurality isn't in danger of being lost, we don't find a co-occurring signal (that is, [e] in the article) maintaining the meaning.
So just to sum up the main findings here:

- /s/-weakening in Occitan includes a stage of vocalization to [j].
- When plural -s on the definite article vocalizes, the vowel of the article raises to [e].
- Though this vowel raising appears to preserve the singular–plural distinction, this change is not actuated for strictly functional reasons. Rather, the change is mechanical but has been used to preserve disappearing /s/.