On the Anatomy of a Prosodic Sociolinguistic Marker in Parisian French

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1. Introduction

Throughout the 20th century, Western European urban centers welcomed considerable immigration from non-European countries. In many cases, this resulted in contexts of contact in which languages that had previously had only limited contact came to co-inhabit the same areas. In the 1960s and 1970s, the Parisian region came to acquire large concentrations of non-metropolitan immigrants, particularly groups from the Maghreb and sub-Saharan Africa. The cities where these groups settled saw extensive contact between immigrant languages and the national language, both with the local vernacular French outside the classroom and with the prestige norm in academic settings. Over time, some such cities came to be characterized by a relatively young population, high unemployment, crime and intense urban poverty (Armstrong & Jamin, 2002).

A highly publicized set of language practices began to emerge from these speech communities, practices associated with the sharp socio-economic and cultural differentiation brought on by an uneven integration of these immigrants and their descendents. In a 1995 interview in *Le Monde*, Christian Bachmann, a French sociologist, speaks of "youth living in housing projects" who are "disconnected from the middle class universe" and "inventing their own way of speaking" (Genin, 1995, p. 2). He also spoke of these youths' characteristic accent, stating that "the average French person feels threatened by their particular intonation curves which sound like a verbal fight". Although "Parisian French" usually refers to the highly standardized prestige variety, such observations demonstrate that the region is also home to a strongly connoted set of language practices associated with poor cities with large ethnic minority populations. In this article, such practices will be referred to collectively as the "Parisian urban youth vernacular".

2. Background

Among Romance languages, French possesses a divergent intonation in which word-level stress is not contrastive, but always occurs on the final syllable. In larger chunks of speech, the realization of stress on a word's final syllable is dependent on that word's position in the larger phrase, with stress occurring phrase-finally. In addition to the acoustic cues of increased duration and greater intensity, this stress is marked by a steep pitch rise. An initial rising tone in accentual phrases (APs) is typically analyzed as a phrase accent, in contrast to the phrase-final pitch accent, giving the underlying LHiLH* tonal pattern as the default pattern for basic unmarked intonation. APs are said to be bound within Intonational Phrases (IPs) such that an AP-final pitch accent is pre-empted by an IP-final boundary tone (L% or H%) when it occurs at the end of this larger prosodic unit. IP-final syllables are significantly lengthened and optionally followed by a pause (Jun & Fougeron, 2000, 2002).

In addition to this neutral intonation configuration, a number of prosodic patterns are used by speakers to convey pragmatic meanings. Amongst these, researchers have cited a sharp fall on the penultimate and phrase-final syllables, a H*L%, as constituting an imperative pragmatic meaning (Di Cristo, 1999a, b). Léon (1974) presents a taxonomy of imperative intonation contours that includes a

particular "saw-tooth" pattern with "an implication of threat or warning" that speakers use to indicate anger.

Descriptions of the Parisian urban youth vernacular note an accentual pattern in which the pitch accent appears to have shifted to the penultimate, allowing for a phrase-final falling contour similar to that described in Léon (1974). The only empirical production study of this prosodic variation concludes that French-Arabic / Berber bilinguals may possess a composite tonal inventory that comprises two listing contours: General French's phrase-final rising intonation and another contour in which this rise occurs on the penultimate with a phrase-final fall (Fagyal, 2003, 2005). This study finds no evidence of penultimate lengthening, however, seemingly disfavoring the analysis of a novel penultimate stress pattern. Nonetheless, the prosodic distinctiveness of this accent may still derive from a phrase-final strong-weak stress pattern. That is, the perception of this novel accentual configuration could be triggered by acoustic cues in the penultimate, such as long duration and/or early alignment of the phrase-final LH* rise, or in the final, short duration and distinctive alignment of the LH* pitch accent. Only perceptual testing may resolve the question of which of the cues found in Fagyal (2003, 2005) trigger the perception of the Parisian urban youth vernacular.

This article presents two such perceptual studies: an experiment targeting the perception of penultimate and final syllable duration and a socio-phonetic study on the salient prosodic properties of the Parisian urban youth vernacular. A perceptual approach also permits the testing of how differences between listeners impact the perception of this accentual pattern. Because experience with dialects has been shown to impact how listeners hear dialectal variation (Clopper & Pisoni, 2006), it was hypothesized that experience with non-standard language, regional languages, foreign languages etc., might influence how listeners hear prosodic variation associated with the Parisian urban youth vernacular. After the following description of the two perceptual studies, this article will conclude with a discussion of how idiosyncratic factors such as an individual's "sociolinguistic experience" might be incorporated into a robust model of speech perception.

3. Study 1: Patterns of Perception of Penultimate and Final Syllable Duration
3.1. Methodology

An initial study aimed first to determine the minimum duration which, when added to a penultimate or final syllable, induces the perception of a lengthened syllable, that is, a durational just noticeable difference (jnd) for these syllables. This jnd would serve as a reference for the minimum amount of perceptible lengthening for penultimate and final syllables in the second study. A related goal was to test patterns of salience for penultimate and final syllable lengthening in Parisian French. Although phrase-final stress was expected to render final syllable duration highly salient, listeners may also attend to penultimate duration if it serves as a prosodic marker of the Parisian urban youth vernacular.

Stimuli were made by first estimating a "preferred duration" (Noteboom, 1973) for both syllables in seven stimulus words. That duration was then lengthened in resynthesized stimuli to determine when listeners perceived such lengthening to be salient. These seven words included monosyllabic (*un zoo*, *une dame*), bisyllabic (*des légumes*, *du muguet*), trisyllabic (*des animaux*, *un revolver*) and quintasyllabic (*Zinadine Zidane*) forms. It was hypothesized that more robust estimates of durational jnds would be derived by using stimulus words with varying numbers of syllables.

Multiple productions of each stimulus word were first segmented using visual and auditory landmarks to obtain an initial duration against which to contrast lengthened syllables. These productions came from male students pronouncing target words during a picture-naming task in a middle school in *La Courneuve*, a poor, multi-ethnic Parisian suburb (Fagyal, 2003, 2005). A mean of the penultimate and final syllable durations in these productions was calculated. This duration then served as a base duration against which various lengthened conditions were compared. All durational conditions were inserted into one production originally produced with phrase-final lengthening and a rising intonation to isolate the variable of interest: the perception of penultimate and final syllable duration.

Any syllables preceding the penultimate and final were resynthesized such that their duration was equal to this base duration. For penultimate and final syllables, the base duration was lengthened by 10%, 20%, 30%, 40% and 50% (henceforth Ts1, Ts2, Ts3, Ts4 & Ts5). All resynthesis procedures were accomplished using a script for PRAAT's DurationTier, a PRAAT object that allows for the expression

of portions of an utterance's duration relative to overall duration. After indicating the original duration and a new duration, the script computed a fraction representing the original-to-modified duration ratio. The DurationTier object was then accorded the duration represented by this fraction using a linear interpolation algorithm. Durations were modified by applying the DurationTier object to recordings using PRAAT's PSOLA (Pitch-Synchronous OverLapAdd) resynthesis function (Moulines & Verhelst, 1995). Stimuli were then built with new durational configurations by combining these resynthesized syllables. Finally, all stimuli were inserted into a carrier sentence consisting of "*ça c'est…*" ('that is') and the appropriate indefinite article. In monosyllabic stimuli, the article was considered the phonological phrase's penultimate syllable.

Stimuli were presented to participants in an AX ("same or different") discrimination task using a 1500 ms interstimulus interval (ISI), an ISI triggering processing at a phonemic level and discouraging lower-level phonetic processing (Werker & Tees, 1984). Stimuli were randomized within items so that they had an equal likelihood of being in an AX or XA pair. Responses and reaction times (RTs) were collected using DmDX (Forster, 2000) and a laptop keyboard. Listeners heard stimuli through Roland RH-50 headphones set at a comfortable listening level, approximately 75 dB SPL. No feedback was given and responses timed out after 10 seconds. In all, 7 stimulus words * 30 possible environments for syllable duration * 2 syllables (penultimate and final) gave 420 AX/XA items. With the inclusion of 252 AA items, items with two identical stimuli, the experiment used 672 stimuli which were blocked by word, but randomized within and across blocks.

Listeners advanced through the stimuli by pressing the space bar and were allowed to pause between blocks. Twenty-five native speakers of Parisian French living in the Parisian region participated. Possibly due to listener fatigue caused by the length of the study, RT data revealed no distinctive trends. The following results then focus on listeners' responses.

3.2. Results

Repeated Measures Analysis of Variance tests (RM-ANOVAs) were carried out on responses for AX pairs to test for the salience of penultimate and final syllable lengthening. The two monosyllabic stimuli revealed significant main effects only for final syllables [*zoo*: $F(4,26) = 4.26$, $p < .05$], [*dame*: $F(4,26) = 10.56$, $p < .01$]. For *dame*, a *post-hoc* paired t-test indicated a statistically significant increase in proportion correct scores going from items in which the base duration contrasted with Ts4 (M =.61, SD =.29) to items with the base duration and Ts5 (M=.71, SD =.29); t(26) = -2.19, $p < .01$. For bisyllabic words, a significant main effect was again only found for both words' final syllable [*gumes*: $F(4,26) = 10.56$, $p < .01$], [*guet*: $F(4,26) = 16.51$, $p < .01$] and *post-hoc* testing revealed an identical pattern. Listeners reliably distinguished between AX pairs for both words when the final syllable had been lengthened by 50% (*guet*: M=.74, SD=.25; *gumes*: M=.71, SD=.3) as opposed to 40% (*guet*: M=.64, SD=.29; *gumes*: M=.61, SD=.29); *guet:* t(26) = -2.36, $p < .05$; *gumes*: t(26) = -2.19, $p < .05$. In trisyllabic words, significant main effects were again only found for both words' final syllables [*mal*: $F(4, 26) = 11.32$, $p< .01$], [*ver*: $F(4, 26) = 12.41$, $p< .01$]. Paired t-tests found a statistically significant jump in proportion correct scores with 30% (*mal*: M=.32, SD=.22; *gumes*: M=.38, SD=.28) as opposed to 20% lengthening (*mal*: M=.47, SD=.3; *gumes*: M=.52, SD=.3); *mal:* t(26) = -2.87, $p < .01$; *ver*: t(26) = -2.79, $p < .01$. No significant main effects emerged from proportion correct scores for the one quintasyllabic stimulus word.

Overall, these results indicate that lengthening of final syllables is most perceptible when a "preferred duration" is lengthened by 50%. Final syllable length appears to be more salient, although firm conclusions are tenuous given the length of the study. While this result is not surprising given that stress is phrase-final, it does indicate that listeners do not appear to attend to penultimate duration as they might were it a salient prosodic marker of the Parisian urban youth vernacular.

4. Study #2: Socio-Indexicality of Variations in Penultimate and Final Syllable F_0 and Intonation
4.1. Methodology

A second perceptual study examines claims that a particular prosodic pattern evokes the perception of the Parisian urban youth vernacular. Two prosodic dimensions were targeted:

penultimate and final syllable duration and F_0. For the stimuli used in this study, two different productions of five words (*animaux*, *bagages*, *bijoux*, *image* & *légume*) were excised from the same fieldwork recordings used in Study #1. One production contained a canonical phrase-final rise described in listing contours in French (henceforth "rise production type"). The other had a tonal pattern similar to that described as being typical of the Parisian urban youth vernacular, a rising F_0 occurring on a lengthened penultimate and a phrase-final fall (henceforth "rise-fall production type"). Stimulus words were selected by the researcher and constrained by the need to locate both production types in the recordings. All speakers were, again, male middle-school students from *La Courneuve*. The rise and rise-fall production types for the stimulus word *animaux* are shown in Figure 1.
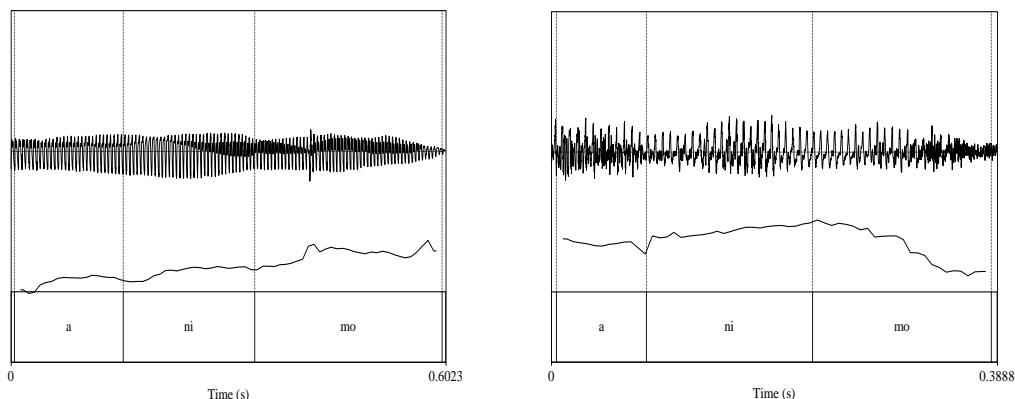

Figure 1.   Rise (left) and rise-fall (left) production types for the *animaux* stimulus word

Testing confirmed the hypothesis of systematically distinct prosodic patterns in the two productions of these five words. Wilcoxon rank sum tests indicated that penultimate syllable durations in rise productions (*Mdn* = 34.75% of total duration) were significantly shorter than penultimate syllable durations in the rise-fall productions (*Mdn* = 43.94%), [W = .5, p < .05]. Rise productions' final syllables (*Mdn* = 62.78%) were longer than those in rise-fall productions (*Mdn* = 53.3%), but this difference did not reach statistical significance at the α= .05 level [W = 13, p = .1]. In rise-fall productions, the phrase-final F_0 peak appeared to be aligned more with the penultimate-final syllabic boundary than the final syllable. This observation was tested using a PRAAT script that located the time at which the F_0 peak occurred, expressing this time value as a percentage of the rendition's overall duration. If rise-fall productions did indeed have a F_0 peak whose alignment occurred earlier in the word than those of the rise productions, this percentage should be reliably smaller for the rise-fall renditions. Again using a Wilcoxon rank sum test, rise-fall productions were shown to have a pitch peak occurring at a point significantly earlier in the word (*Mdn* = 59.78%) than the rise productions (*Mdn* = 84.63%), [W = 24, p < .01].

On the basis of these differences, penultimate and final syllable durations as well as phrase-final pitch peaks were targeted in a series of acoustic resynthesis manipulations which are described in the following section. The stimuli produced from these manipulations were used in a socio-phonetic perceptual study, described in 4.3, to determine if these differences were both salient and socially meaningful.

4.2. Resynthesis Procedures

For each of the five stimulus words, rise and rise-fall production types were first submitted to a PRAAT resynthesis script that recalibrated the average intensity of all recordings to an average root mean square (RMS) level of .1 Pascals, thus controlling the magnitude of fluctuations in intensity. This procedure preserved the fluctuations in intensity typical of natural speech while attenuating any large variations in loudness.

Next, penultimate and final syllables were built for all 10 productions (rise and rise-fall production types for five stimulus words) that comported a "short" and "long" duration. The "short" duration consisted of the mean duration of this syllable for the rise and rise-fall production types. A

"long" syllable lengthened this "short" syllable duration by 50%. Durational manipulations were accomplished using the same procedure as in Study #1. After this first step, resynthesized variants of the rise and rise-fall production types differed only in terms of segmental make-up and intonation contour. All resynthesized syllables were eventually inserted into the rise production type for each stimulus word, thereby eliminating segmental variation as a potentially confounding variable.

Intonation contours were resynthesized by recalibrating the rise-fall production's pitch range to fit that of the rise production. Stimuli were built with the pitch range of the rise rendition, but the penultimate and final syllable pitch movements of the rise-fall production. This was accomplished by a PRAAT script that first created a new PitchTier object. An initial pitch point was inserted in the object at the time and hertz (Hz) value at which it occurred in the rise production. From there on, however, each successive pitch point in 10 ms windows was taken from the rise-fall production. The script performed a recalculation of the relative magnitude of Hz movements between successive points in the rise-fall production so that the movements reflected the pitch range of the rise production. For instance, if the rise-fall production had a pitch range of 164 Hz and a pitch movement of +3.65 Hz from point 1 to point 2, that rise was recalculated to determine its relative equivalent in the pitch range of the rise rendition. If the rise rendition's pitch range was 54 Hz, for example, the +3.65 Hz jump was lowered to an increase of 1.2 Hz. A second pitch point was then plotted at the next time step with a value equal to that of the first point plus the 1.2 Hz increase. The new PitchTier then had the pitch range of the rise production, but the penultimate and/or final syllable F_0 contour shape of the rise-fall production. The new PitchTier object was again inserted into the rise production using PRAAT's PSOLA resynthesis utility. Stimuli were built with four durational conditions (short / long penultimate and final syllable) and four intonation conditions (rise / rise-fall F_0 on penultimate and final syllable).

Stimuli for the current study were, then, constructed with the rise production's segmental features in which the penultimate and final syllables varied in respect to both duration and pitch movements. In this way, stimuli were made with identical voice quality, but distinct phrase-final F_0 contours and durations. Finally, for this study all stimuli were inserted into a carrier sentence of "*Ça c'est*" and a definite or indefinite article. Figure 2 shows waveforms and pitch contours for all 8 stimuli for the stimulus word *légume*.

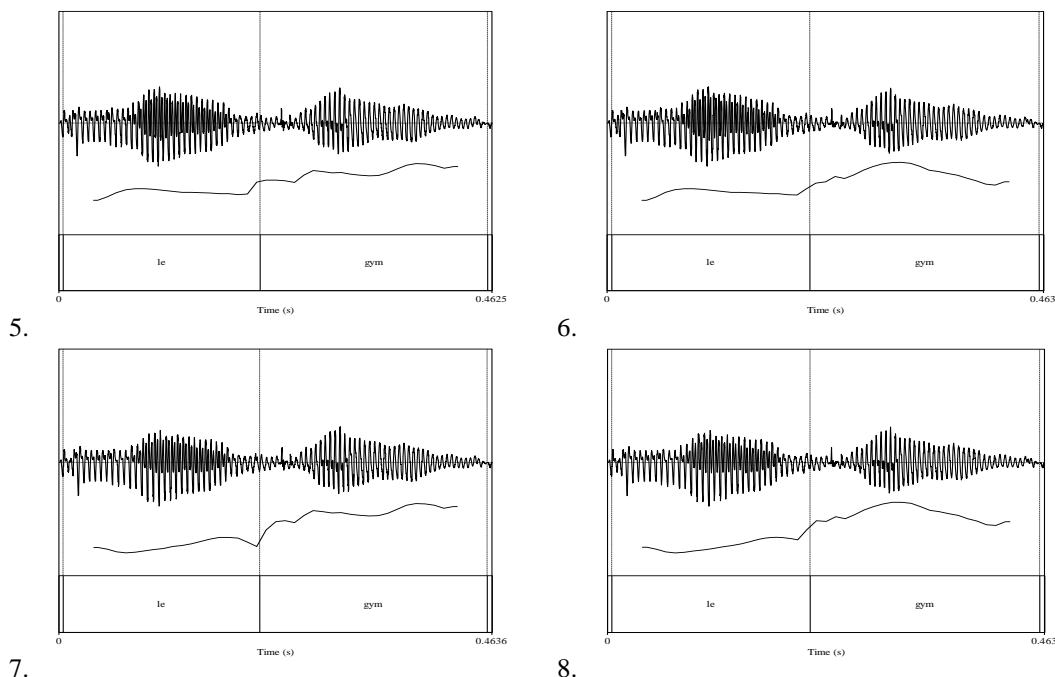1.

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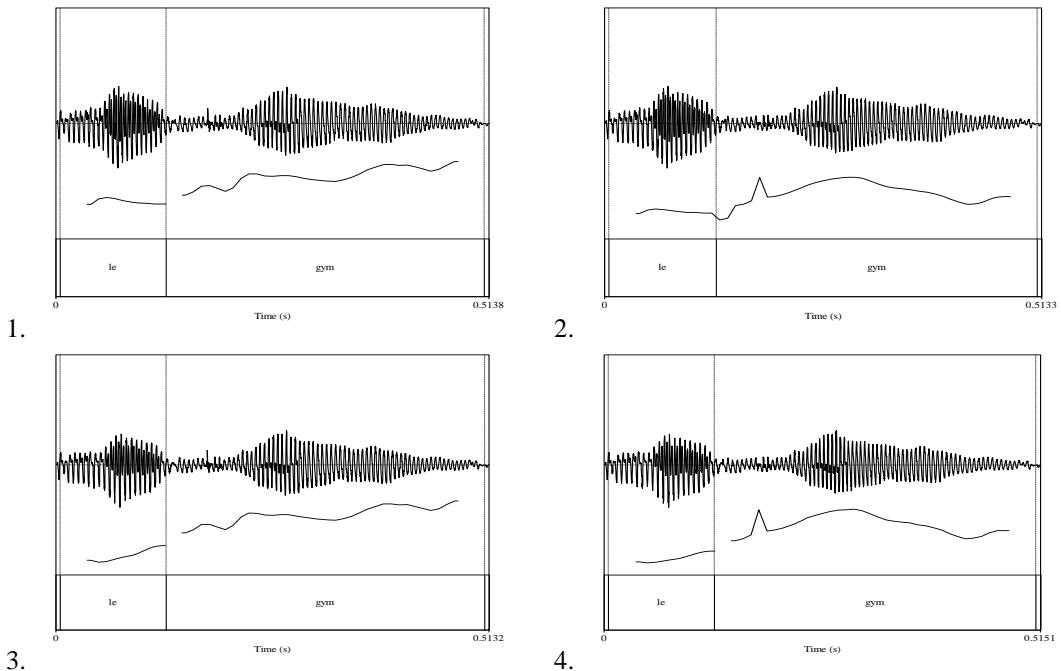
Figure 2. Waveforms and pitch contours for *légume*. #1, 2, 3 & 4 have a short-long penultimate to final duration ratio, whereas #5, 6, 7 & 8 a long-short pattern. #1 & 5 show a penultimate and final bearing the rise production's pitch contour. #4 & 8 indicate a penultimate and final comporting the rise-fall production's contour. #2 & 6 have the rise production's penultimate pitch characteristics, but the rise-fall's phrase-final fall. #3 & 7 have rise-fall's penultimate falling tone with the rise production type's phrase-final rise.

4.3. Evaluation of Stimuli

Listeners' perceptions of the stimuli were tested using a web-based interface in which subjects were asked to situate recordings in one of 12 cities in the Parisian region. This interface appears in Figure 3. For this study, 34 participants were recruited to help "*Marie*", a fictitious school teacher newly arrived in the Parisian region, try to guess where her students lived based on their pronunciation of certain words. During the task, listeners were asked to associate a "pronunciation", one of the 8 prosodic configurations of the five stimulus words (40 total stimuli), with one of 12 cities.
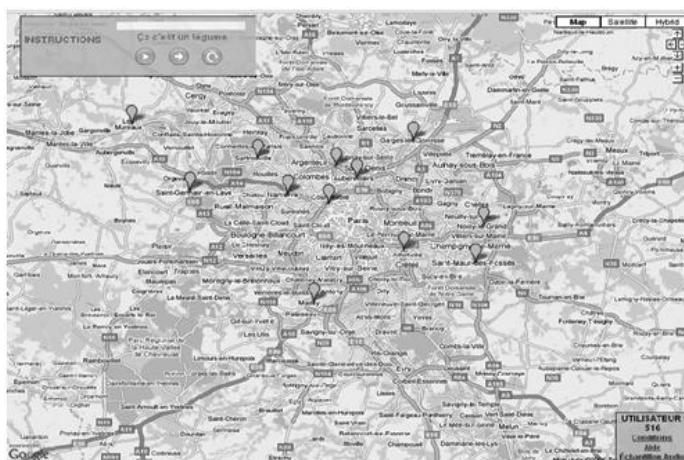

Figure 3. Screen shot of website hosting perceptual mapping task

The selection of these 12 cities was informed by the results of a previous perceptual dialectological study of Parisian French language attitudes. Respondents in this previous study, from which the 34 for the current study were recruited, evaluated the desirability, reputation and linguistic correctness of 21 cities in the Parisian region. Evaluations were framed in terms of suggestions for a provincial couple moving to the Parisian region and the linguistic correctness item asked participants to estimate the degree to which the couple's children might learn "good French" in the 21 cities under consideration. Clustering and scaling analyses of linguistic correctness ratings revealed cohesive groups of cities functioning as perceptual poles of highly positive or negative language attitudes. Those cities evidently associated with prestigious language practices were Neuilly, Saint-Germain-en-Laye, Saint-Maur-des-Fossés, Maisons-Alfort. The cities of Gennevilliers, Aubervilliers, Garges-lès-Gonesse, Les Mureaux appeared to be emblematic of highly stigmatized language practices. These cities are also extremely poor, with mean household incomes less than half that of Neuilly, Saint-Germain-en-Laye, Saint-Maur-des-Fossés, Maisons-Alfort, and are marked by large ethnic minority populations. Given this confluence of factors, it is highly likely that Gennevilliers, Aubervilliers, Garges-lès-Gonesse, Les Mureaux are among the cities that caused Kuiper's (2005) respondents to refer to the Parisian region as being 'home to many immigrants who '"distorted the language"' (p. 44). Although the social stigma surrounding the Parisian urban youth vernacular precludes direct questioning on the areas associated with it, the results of this previous study provide some evidence that such language practices are identified these four cities.

The twelve cities in which listeners placed stimuli in the current study represented those perceived as the most linguistically correct (Neuilly, Saint-Germain-en-Laye, Saint-Maur-des-Fossés & Maisons-Alfort), the least linguistically correct (Gennevilliers, Aubervilliers, Garges-lès-Gonesse & Les Mureaux) and the four nearest the mean linguistic correctness score (Sartrouville, Noisy-le-Grand, Massy & Nanterre). Participants' placements of stimuli in the current study were converted into evaluations using a ranking of the mean linguistic correctness scores for these 12 cities obtained in the language attitudes survey. This scale ranged from 1-12 with 12 representing the highest mean linguistic correctness score and 1 the lowest, essentially providing an indirect evaluation of the linguistic correctness of each stimulus. In order to facilitate reference to this metric, the linguistic correctness ranking of mean linguistic correctness scores of cities into which stimuli were placed will be referred to as "evaluation(s)". It was hypothesized that stimuli with a short-long penultimate to final syllable duration ratio and a phrase-final F_0 rise, pattern #1 in Figure 2 and that described for General French prosody, would be placed in favorably evaluated cities. If a long-short penultimate to final syllable duration ratio and a rise-fall F_0 contour, pattern #8 in Figure 2, was the strongest marker of the Parisian urban youth vernacular, stimuli bearing this pattern would be placed in cities identified with non-prestige language practices.

4.4. Results

In order to determine patterns in stimuli evaluations, these evaluations were submitted to RM-ANOVAs for each word with stimulus item (1 vs. 2 vs. 3 vs. 4 vs. 5 vs. 6 vs. 7 vs. 8) as a within-subjects factor and subject in the error term. For all but one of the five stimulus words, the results indicated a significant main effect of stimulus item on evaluation: *animaux* [$F(7, 175) = 2.0721$, $p < .05$], *bagages* [$F(7, 182) = 4.0546$, $p < .01$], *image* [$F(7, 147) = 2.0777$, $p < .05$], *légume* [$F(7, 154) = 2.2104$, $p < .05$]. The stimulus word *bijoux*, however, showed no such significant main effect [$F(7, 161) = 1.3911$, $p > .05$]. In order to determine which particular stimuli were subject to significantly different evaluations, *post-hoc* testing was undertaken using the evaluations of all words, save *bijoux*. Tukey Honestly Significant Differences (Tukey HSD) tests were performed on stimuli evaluations, the results of which are shown in Table 1. The numbers used to reference stimuli are identical to those used in Figure 2.

Stimulus Words	Pairwise Comparison	Mean Difference	Std. Error
Animaux	Stimuli #1 – 6	-2.38 .	0.843
	Stimuli #3 – 6	-2.35 .	0.843
	Stimuli #7 – 6	-2.46 .	0.843
bagages	Stimuli #5 – 2	-2.63 .	0.882
	Stimuli #6 – 2	-2.78 *	0.882
	Stimuli #7 – 2	-3.59 **	0.882
	Stimuli #8 – 2	-3.26 **	0.882
	Stimuli #7 – 3	-2.89 *	0.882
	Stimuli #8 – 3	-2.56 .	0.882
image	Stimuli #8 – 4	-3.16 *	0.948
légume	Stimuli #5 – 1	-2.83 *	0.928
	Stimuli #8 – 1	-3.22 *	0.928

Table 1. Stimuli with significantly different mean evaluations by Tukey HSD tests ($p < .1 = .$, $p < .05 = *$, $p < .01 = **$).

The results of these analyses shed considerable light on the prosodic differences listeners picked up on as salient and subsequently placed in the least linguistically correct cities. For three out of four stimulus words, the lower rated stimulus of the pairwise comparisons has a lengthened penultimate and a short final (#5, 6, 7 or 8), the higher rated stimuli having a short-long duration configuration (#1, 2, 3 or 4). The three significant pairwise comparisons for the *animaux* stimuli appear to pattern differently from the pairwise comparisons highlighted for the *bagages*, *image* and *légume* stimuli. In the *animaux* pairwise comparisons stimuli #1, 3 and 7 make up the lower rated stimuli with stimulus #6 receiving the higher rating. This finding suggests that this word's stimuli were evaluated differently from the other stimulus words, although no immediate reason was apparent as to why such different evaluations should obtain.

For *bagages*, *image* and *légume*, one or more of stimuli #5, 6, 7 and 8 constituted the more negatively evaluated pair in all statistically significant pairwise comparisons. For all three, stimulus #8 had a mean evaluation that differentiated it from another, more positively evaluated stimulus items. Stimulus #8 incorporated a long penultimate and short final with a rise-fall intonation contour on both syllables. For both *animaux* and *bagages*, stimulus #7, identical to stimulus #8 except for a final syllable F_0 rise, constituted one of the lower rated stimuli in significant pairwise comparisons. Similarly, stimulus #5, with a short-long penultimate to final durational configuration its only resemblance to the rise-fall production type, was also the lower rated stimuli in two significant pairwise comparisons. The only commonality amongst these three lowest rated stimuli is a long penultimate syllable and a short final. In both the highest and lowest rated prosodic configurations, the penultimate to final syllable durational configuration appears to be an important marker of the Parisian urban youth vernacular.

This pattern of results indicates the primacy of duration generally and final syllable duration, in particular, in triggering perceptions of the Parisian urban youth vernacular. It is notable, for instance, that a rise-fall tonal pattern with a short-long durational configuration was not as consistently negatively evaluated as a rise configuration on a long-short durational configuration. Taken together with the results of the first study, these perceptual patterns indicate that listeners are highly sensitive to final syllable duration, both as an indicator of phrase-final stress and a sociolinguistic marker of a Parisian urban youth vernacular. Fagyal (2003, 2005) found no evidence of consistent penultimate lengthening in the speech of French-Arabic / Berber bilinguals and it appears that the absence of this cue is not the most important for perception. Rather, this perceptual testing shows that listeners are more in tune with the absence of acoustic cues to phrase-final stress as a marker of this tonal pattern.

4.5. The Role of Sociolinguistic Experience in Stimulus Evaluations

Dialectological and second language acquisition research has indicated that an individual's experience with language affects speech perception (see Clopper & Pisoni, 2006; Flege, 1995). Perceptions of the prosodic marker of the Parisian urban youth vernacular were hypothesized to be affected by experience with standard and non-standard language and dialectal variation. Data on both were gathered using an index included in a questionnaire administered after the language attitudes survey. This index measured experience with several types of language varieties and practices in addition to considering how participants might gain such experience. Specifically, items inquired as to respondents' experience with dialects, foreign languages and a language game commonly identified with French youth language (*verlan*). The various contexts in which such exposure occurred were also solicited, presented as "home" versus "workplace". The goal of these questions was to arrive at a wide-ranging measure of participants' "sociolinguistic experience" (SLE).

A split plot RM-ANOVA procedure was used to determine if this construct constrained evaluations of the stimuli heard. Of the stimuli designated by the Tukey HSD tests as being the more negatively evaluated member of statistically significant pairwise comparisons, the majority were evaluated more harshly by participants with less SLE subjects than by their high SLE co-participants. The split plot RM-ANOVAs indicated main effects of evaluations on SLE groupings significant at the $\alpha = .1$ level for three of the four stimulus words: *bagages* [$F(2, 13) = 5.5874$, $p < .05$], *image* [$F(2, 10) = 3.5567$, $p = .06812$] and *légume* [$F(2, 11) = 5.0144$, $p < .05$]. The results of this second analysis then indicate that stimuli with penultimate prosodic prominence were typically placed in cities with less linguistic prestige by subjects with lower levels of SLE.

The small number of subjects and stimulus items excludes firm conclusions on the role of sociolinguistic experience in the perception of socially stigmatized allophonic variation. However, this testing does suggest that individuals with a more diverse linguistic background are less likely to negatively evaluate a prosodic marker of the Parisian French urban youth vernacular.

5. Discussion and Conclusions

Although these two studies shed light on the perception of prosodic variation tied to the Parisian urban youth vernacular, they do not address how such variation is processed. One hypothesis is that listeners' negative evaluations are triggered by the use of a threatening imperative contour similar to that described in Léon (1974) in a non-felicitous context. Another hypothesis is that this accentual pattern may have initially been perceived negatively because of its imperative connotation, but that it has now become a marker of the Parisian urban youth vernacular. Although a very different methodology would be necessary to establish firm conclusions either way, the degree of meta-linguistic commentary on this accentual pattern favors the second interpretation, pointing towards the status of a sociolinguistic "marker" (Labov, 2001, p. 196).

Secondly, these studies speak to the value of perceptual testing as a method for ensuring that observations from production studies align with phonetic variation that is salient to listeners. While both impressionistic and empirical production evidence pointed to the distinctiveness of penultimate prosody, certainly unusual in Parisian French's weak-strong phrase-final stress pattern, these perceptual studies show listeners cuing in on the *absence* of General French's phrase-final stress as a prosodic marker. This result points to the necessity of testing phonetic variation in perceptual methodologies before concluding that such variation is meaningful for listeners.

As speech perception research continues to document how perception and, in turn, production are affected by subject-specific factors like sociolinguistic experience, it will become increasingly important to be able to model such factors. One such model is found in Kristiansen (2003). In this chapter, it is proposed that (1) allophonic variation may be [socially] distinctive and (2) certain allophonic variants may be more salient than others allowing listeners to group the use of these variants with social groups. Phonetic cues that are socially distinctive are asserted to employ the same cognitive machinery as the activation of social categorization by any other continua of sensory input (eg. skin color, facial features, etc.) On a phonemic or suprasegmental dimension with social relevance, listeners would group allophonic variation into particular categories, presumably at thresholds. These thresholds would be particular to the listener and potentially molded by factors such as listeners' backgrounds. A speaker using a given arrangement of allophonic variation falling into

such socially relevant categories would cue the perception of a social / linguistic identity for a given listener. This model is, then, capable of modeling both contextual and listener-specific effects on speech perception. By conceiving of allophonic variation as being socially distinctive, it may be possible to capture both the cognitive processing of socio-phonetic variation and model how such perception is subject to factors such as sociolinguistic experience.

References

Armstrong, Nigel & Jamin, Mikaël. (2002). *Le français des banlieues*: Uniformity and Discontinuity in the French of the *Hexagone*. In Kamal Salhi (Ed.), *French in and out of France: Language Policies, Intercultural Antagonisms and Dialogue* (pp. 107-136). Bern: Peter Lang.

Clopper, Cynthia & Pisoni, David. (2006). Effects of region of origin and geographic mobility on perceptual dialect categorization, *Language Variation and Change, 18*, 193-221.

Conein, Bernard & Gadet, Françoise. (1998). Le "français populaire" des jeunes de la banlieue parisienne entre permanence et innovation. In Jannis Androutsopoulos & Arno Scholz (Eds.), Jugendsprache / Langue des jeunes / Youth language (pp. 105-123). Frankfurt: Peter Lang.

Di Cristo, Albert. (1998). Intonation in French. In Daniel Hirst & Albert Di Cristo (Eds.), *Intonation Systems: A Survey of Twenty Languages* (pp. 195-218). Cambridge: Cambridge University Press.

Di Cristo, Albert. (1999a). Vers une modélisation de l'accentuation du français: première partie. *French Language Studies, 9*, 143-179.

Di Cristo, Albert. (1999b). Vers une modélisation de l'accentuation du français: seconde partie. *French Language Studies, 10*, 27-44.

Fagyal, Zsuzsanna. (2003). The Matter with the Penultimate: Prosodic Change in the Vernacular of Lower-Class Immigrant Youth in Paris. *Proceedings of the 15th International Congress of Phonetic Sciences, Volume 1: Barcelona*, pp. 671-674.

Fagyal, Zsuzsanna. (2003)[2005]. Prosodic consequences of being a *Beur*: French in contact with immigrant languages in Paris. *Selected papers from NWAV 32, Philadelphia,* 2004, *Working Papers in Linguistics 10*(2), 91-104.

Flege, James. (1995). The Phonetic Study of Bilingualism. In Gerrit Bloothooft, Valerie Hazen, Dieter Huber & Joaquim Llisterri (Eds.), *European Studies in Phonetics and Speech Communication* (pp. 98-103). Utrecht: OTS Publications.

Forster, Kenneth & Forster, Jonathan. (2009). DmDX (Version 4) [Computer Program]. (http://psy1.psych.arizona.edu/~jforster/dmdx/help/dmdxhdmdx.htm)

Genin, Catherine. (1995, September 2) Les jeunes des cités ont inventé leur propre langue. *Le Monde*.

Jun, Sun An, & Fougeron, Cécile. (2000). A Phonological Model of French Intonation. In A. Botinis (Ed.), *Intonation: Analysis, Modeling and Technology* (pp. 209-242). Norwell, MA: Kluwer Academic Publishers.

Jun, Sun An, & Fougeron, Cécile. (2002). Realizations of accentual phrase in French intonation. *Probus: International Journal of Latin & Romance Linguistics*, *14*(1), 147-172.

Kristiansen, Gitte. (2003). How to do things with allophones: Linguistic stereotypes as cognitive reference points in social cognition. In René Dirven, Roslyn Frank & Martin Pütz (Eds.), *Cognitive Models in Language and Thought: Ideologies, Metaphors and Meanings* (pp. 69-120). New York: Mouton de Gruyter.

Labov, William. (2001). *Principles of Linguistic Change: Social Factors*, volume 2, Blackwell: London.

Léon, Pierre. (1974). Modalité imperative et intonation. *World Papers in Phonetics, Festschrift for Dr. Onishi's Kuju* (pp. 253-280). Tokyo: Phonetic Society of Japan.

Moulines, Eric. & Verhelst, Werner. (1995). Time-domain and frequency-domain techniques for text-to-speech synthesis using diphones. *Speech Communication, 9*, 453-467.

Nooteboom, Sieb G. (1973). The Perceptual Reality of Some Prosodic Durations, *Journal of Phonetics*, 1, 25-45.

Boersma, P. & Weenink, D. (2009). Praat: doing phonetics by computer (Version 5.1.11) [Computer program]. (http://www.praat.org/)

Werker, Janet F. & Tees, R. C. (1984). Perceptual Flexibility: Maintenance or Recovery of the Ability to Discriminate Non-Native Speech Sounds. *Canadian Journal of Psychology 38*(4), 579-590.

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