ABSTRACT: Beckman and Pierrehumbert (1986) and Pierrehumbert and Hirschberg (1990) claim that final vocatives are prosodically separate from preceding matrix structures. We present data from two experiments on the prosodic incorporation of utterance-final vocatives in American English. One of these, based on dramatic reading of two scenes from a make-believe play, shows that in contexts approximating natural speech, final vocatives are prosodically incorporated into the matrix-structure intonation. By contrast, the second experiment, using decontextualized list readings, shows patterns similar to those of Beckman and Pierrehumbert (1986) and Pierrehumbert and Hirschberg (1990). We argue that final vocatives are not preceded by a prosodic break in natural speech. Further, we propose that dramatic readings are an important new tool in approximating natural speech in experimental situations.

KEYWORDS: final vocatives, prosodic incorporation, syntax-phonology interface

0. INTRODUCTION

While the prosody of free and utterance-initial vocatives has been widely discussed in the literature, especially under the notion of “vocative chant” (e.g. Gibbon 1976, Ladd 1978, 1996), the prosodic behavior of utterance-final vocatives has not received the same attention. Exceptions are Beckman & Pierrehumbert (1986), Pierrehumbert & Hirschberg (1990) vs. Liberman (1975), Goldsmith (1999), and Rappaport (1983).

According to Beckman and Pierrehumbert (1986), final vocatives are prosodically separate from the preceding utterance. As shown by the lower panel in Figure 1, before the final vocative Manny, the verb win exhibits considerable lengthening compared to the upper panel, where Manny is the object. Beckman and Pierrehumbert therefore analyze the
vocative as an intermediate phrase (ip) boundary between the phrase-final *win*, and vocative “tag” *Manny*. The account of Pierrehumbert and Hirschberg (1990) is substantially the same.

Figure 1: Vocative vs. complement (Beckman & Pierrehumbert 1986, Figure 27)

a. Mary will win Manny  
b. Mary will win, Manny

Beckman and Pierrehumbert’s account conflicts with the claim by Liberman (1975) that phrase-final vocatives are deaccented and the implication that they therefore do not constitute separate prosodic phrases. Rappaport (1983) claimed that while initial vocatives are separated by a “comma intonation”, final vocatives are not; see [1]; but unfortunately, he did not provide phonetic evidence for his claim.
Such evidence has been provided more recently by Goldsmith (1999), who argues on the basis of a perception study that final vocatives do not sound natural with a preceding prosodic break and that they behave like clitics, without independent pitch accent.

There are thus two competing perspectives on the prosodic behavior of utterance-final vocatives — the Beckman & Pierrehumbert claim that vocatives form separate prosodic phrases and the Rapaport-Liberman-Goldsmith view that they do not. Within the latter perspective it is useful to distinguish two factors, which do not necessarily coincide — prosodic incorporation of final vocatives into the preceding utterance and unstressed, clitic behavior.

In this paper, we report on two acoustic phonetic experiments on English utterance-final vocatives, one based on (decontextualized) list readings, the other on performances of a constructed dramatic dialogue. The results of our experiment support the Rapaport-Liberman-Goldsmith perspective. Specifically, they support the view that final vocatives can be prosodically incorporated into the preceding utterance. While the final vocative in such structures may in many cases appear to be stressless, and hence can be interpreted as clitic, in some cases a downstep analysis may be more appropriate. Finally, while incorporation of final vocatives occurs frequently in our data, there are cases where the final vocative does indeed constitute a separate prosodic phrase. Vocative incorporation, thus, is an optional phenomenon.

The rest of our paper is organized as follows. Section 1 outlines the methodology employed in our experiments and the justification for

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running two separate experiments. Section 2 presents the results of our experiments. Section 3 contains a summary of our findings and their implications.

1. METHODOLOGY AND JUSTIFICATION OF OUR APPROACH

1.1. List reading vs. Dramatic dialogue

As is well known, list-reading experiments are fraught with difficulties. In the case of utterance-final vocatives, the most obvious potential problem is that, confronted with a comma before the final vocative in the written representation, participants will insert a prosodic break, whether they would do so in natural speech or not.

To avoid this problem we devised a novel methodology – an experiment consisting of two dialogues from a make-believe play which participants, who had previous theatre experience, were asked to perform. To avoid participants’ guessing at the purpose of the experiment, we included a large number of utterances without vocatives, as well as utterances with initial vocatives, medial vocatives, and final vocatives (the target of the experiment). Participants were furnished “stage instructions”, characterizing the two interlocutors, John and Jean, as a married couple that likes mountain climbing, has a dog etc., as well as expresses their love by addressing each other by name frequently; see the Appendix. (The latter element was included to make participants more comfortable with the frequent occurrence of vocatives. While some of the subjects commented afterwards that they found this particular feature slightly peculiar, none of them was able to guess the purpose of having the vocatives in the dialogue.) In addition, the scenes contained further “stage” instructions such as the following.

It’s late Saturday morning. John, who often works from home, is in the downstairs study trying to find a bug in an application he’s just finished writing. Jean, who doesn’t bring work home because her company is paranoid about industrial espionage, is upstairs doing pullups on a hangboard.
Participants were given thirty minutes to familiarize themselves with the characters and the scenes before starting the oral performance.

To further assess the usefulness of our novel methodology, we ran a second experiment under the usually employed list-reading conditions with, of course, the usual distractor utterances. As we will show below, there is a difference in results, with the dialogue experiment yielding results that generally conform to the Liberman-Rappaport-Goldsmith perspective, while the list reading experiments resulted in patterns more in keeping with the Beckman & Pierrehumbert and Pierrehumbert & Hirschberg perspective. (But see Section 3 below.)

1.2. Data
Both experiments employed utterances with initial, final, and medial vocatives, in addition to structures with light adverbs in similar positions, as well as distractor utterances. See [2] for selected examples.

[2] a. Jean, could you check the mail for me
   b. I’m getting tired of this, John
   c. OK, let’s go then
   d. Maybe we have a new mailman

1.3. Participants
Six male and six female speakers participated in the dialogue experiment; for the list-reading experiment we were able to find only five males and one female. All subjects were native speakers of American English, and most were students at the University of Illinois, except for one faculty member. As noted earlier, the participants in the dialogue experiment all had prior experience in theatre.

1.4 Methodology
Subjects were recorded in the sound booth of the Phonetics Laboratory, UIUC Department of Linguistics, employing head-mounted AKG microphones and a Tascam DA-P1 portable DAT recorder. Speech data were digitized and sampled at 22050 Hz, using a Kay Elemetrics CSL box. The data were analyzed using PRAAT, focusing on durational and pitch data in the transition between final vocatives and the preceding utterance, with special attention to evidence of f₀ resetting.
2. RESULTS

2.1 Dialogues
The dialogue experiment was the core of our investigation. We are therefore reporting our findings for this part in greater detail than those of the list-reading experiment.

2.1.1 No break, no resetting
Examination of our data from the dialogue experiment reveals that in most cases, final vocatives were not preceded by pauses. Additionally, in most cases a continuous \( f_0 \) trajectory was found between the final word of the preceding utterance and the final vocative; put differently, vocatives did not exhibit \( f_0 \) resetting. See Figure 2.

![Figure 2: Absence of pauses and \( f_0 \) resetting between ‘sorry’ and ‘Jean’ in dialogues (John 1)](image)

This, at least, holds true in voiced contexts. Voiceless contexts, as in Figure 3, give the appearance of a break, as well as of a slight \( f_0 \) resetting.

![Figure 3: Apparent \( f_0 \) resetting and prosodic break in a phonetically voiceless context in dialogues (John 3)](image)
However, the apparent break can be attributed to the absence of a voice bar; and the slight $f_0$ rise after the burst can be attributed to the crosslinguistic tendency of voiceless consonants to raise $f_0$. There is no new prosodic prominence on Jean, and the overall intonational trajectory remains undisturbed.

There are, however, a few cases (two to three percent of the total) which show a slight $f_0$ rise even in voiced context; see Figure 4.

A completely different pattern, with a robust pre-vocative break, occurred once in our data. Here, the participant, apparently influenced by the initial, attention-getting vocative which is set off by a clear prosodic break, chose to perform the final vocative as a similar robust, separate prosodic phrase, with strong $f_0$ reset; see Figure 5.2

Examples like this suggest that the distinction between “initial” vs. “final” vocatives may not be sufficient, but that functional differences must also be considered. Initial vocatives tend to be attention-getting and hence, presumably, prosodically strong; final vocatives tend to serve “phatic communion” and like other aspects of phatic communion tend to be prosodically “underplayed” (consider the fact that forms of address, such as madam, are frequently reduced to ma’am).
2.1.2 Evidence from questions
Especially noteworthy are questions, where the final rise in intonation extends from the preceding utterance through the vocative, without prosodic break or f₀ reset; see Figure 6. (The slight f₀ lowering at the burst of the consonant onset of the vocative is attributable to the voicing of that consonant; the high f₀ target of the intonational contour is firmly anchored to the vocative, showing that it is prosodically incorporated into the matrix clause.) The rise is even more noticeable in Figure 7.

Another important finding is that there is a great amount of variation between different productions of the same utterance. Compare Figures 6 and 7 to each other, as well as to Figure 8.
2.1.3 Prosodic attenuation of vocatives

Note further the general tendency of the final vocative to have much lower intensity than the last prosodically prominent element of the preceding utterance; In Figure 9 below intensity measures from the OK, Jean portion of Is that OK, Jean? are presented from 5 speakers. (These can be compared with the productions in figures 6, 7, and 8) Examples like these seem to support the view that final vocatives are similar to clitics. However, not all examples show such amplitude lowering as can be seen from the intensity track of ‘John 2’ in Figure 9.
2.1.4 Similarity to light adverbs and complements
As it turns out, utterances with final light adverbs exhibit similar intonational contours as those with final vocatives. See e.g. Figure 10 beside Figure 11. The situation is similar for final light complements, as in Figure 12. Evidence of this type is important, for it shows that there is no substantial difference between light adverbs and complements, which syntactically are part of the matrix clause, and vocatives, which are not — both are equally integrated into the overall prosodic structure.

Figure 10: “OK, let’s go then” (John 1)

Figure 11: “Let’s go, Jean” (John 2)
2.2 List-reading results

Prosodically unincorporated final vocatives, as in Figure 4, are more commonly found in the list-reading context than in the dialogue experiment. In Figure 13 there is a major break in the $f_0$ trajectory before the vocative.

However, incorporated vocatives do occur even in list reading. Consider Figure 14, where the $f_0$ contour moves without break from the preceding structure into the vocative.
While decontextualized list reading most certainly leads to more instances of unincorporated final vocatives, the ratio between incorporated and unincorporated vocatives still is 2:5. That is, nearly 40% of list-reading instances show incorporation of the final vocatives, without f0 resetting or prosodic break.

An especially interesting — and unexpected — result of the list-reading experiment was evidence that, for some speakers, there is no difference in the realization of the compound paperboy vs. the expression paper:boy with final vocative; see Figures 15 and 16. As can be seen, the two structures are virtually identical, even though Figure 15 comes from the larger structure 15’, while Figure 16 comes from 16’. Note, however, that in both cases the element boy is not attenuated but looks like an independent intonational phrase, possibly with downstep. Still, the vocative boy is as firmly integrated into the preceding utterance as is the second element of the compound paperboy. (In the total reading list of 33 items, paper, boy is number 2, paperboy number 23, and the two are separated by such disparate items as What are we getting upset about [#5], Arguing is stupid [#12], and That’s biologically impossible [#19], but no occurrences of either paper or boy. The possibility that the two list items influenced each other can therefore be safely excluded.) Here and in the following examples the f0 tracks are superimposed on to the spectrograms for ease of exposition.
English utterance final vocatives

Figure 15: Paper Boy 1

Figure 16: Paper Boy 2
Figure 15’: Bring the paper, boy

Figure 16’: Tell the dog to stop barking at the paperboy
3. CONCLUSIONS AND OUTLOOK

Our experiments provide strong acoustic support for the general tenets of the Liberman-Rappaport-Goldsmith perspective. Utterance-final vocatives commonly are prosodically incorporated into the preceding utterance, without any appreciable break and without $f_0$ resetting. This is especially true for the dialogue experiment, while the list-reading experiment yielded a higher proportion of unincorporated final vocatives. In this regard, final vocatives tend to behave very much the same way as final light adverbs or complements.

What is especially noteworthy is the behavior of questions, where the final intonation rise extends from the preceding utterance through the vocative, without break or reset. Here we have strong supporting evidence for the hypothesis that final vocatives normally do not have any tonal properties of their own but that, rather, their behavior is determined by the totality of the utterance intonation. In this sense, final vocatives exhibit a behavior similar to utterance-final words in Huichol which, as Grimes (1959) has shown, lose their underlying tones and exhibit only the tonal properties of the utterance intonation.

At the same time, there are cases with a clear prosodic break before the final vocative — more common in list reading than in dialogue, but not excluded from the latter. Moreover, as the paper (,) boy case suggests, there can be instances where final vocatives, though integrated into the preceding utterance, may not exhibit prosodic attenuation. The latter issue suggests that there still is room for further research and for possible reconsideration of earlier theories.

What also needs further investigation and consideration is the question of how passages with clear prosodic break relate to the Beckman-Pierrehumbert hypothesis. Notice that while there is greater length in the verb win in the vocative portion of Figure 1, we do not find any robust evidence for $f_0$ reset. The low pitch on the final vocative would be compatible with either a separate prosodic phrase analysis or with a clitic-like account. So the evidence, on the face of it, is inconclusive, especially in the absence of other indicators such as amplitude. Most important, it is not clear to what extent the difference between the two
patterns remains within the window of variation between different productions of the same utterance; see the three versions of the utterance *Is that OK, Jean?* in Figures 6, 7, and 8, reproduced below for ease of comparison. As can be readily seen, there are variations in terms of the temporal distribution of *OK* and *Jean*, the degree of amplitude attenuation of *Jean*, the overall intonational trajectory, and the degree to which the initial stop closure of *Jean* affects $f_0$ transition.

Is that OK, Jean (John 1)

Is that OK, Jean (John 2)
Beyond these specific findings, we want to call attention to the novel experimental method of dramatic dialogue that we have employed in order to avoid (or at least mitigate) the problems encountered in list-reading experiments. Compared to the list reading results, the findings of the dialogue experiment clearly conform better to the perception-based finding of Goldsmith that final vocatives sound more natural if not preceded by a prosodic break and, in that sense, seem to provide more reliable evidence for natural speech behavior.

The dialogue method has proved useful in another experiment, on the prosodic behavior of utterance-final verbs in Bangla (Bengali). As reported in Dutta and Hock (2006), it helped confirm that utterance-final verbs normally are unaccented in Bangla and, moreover, it revealed additional phonetic evidence for the non-prominence of final verbs, in terms of pervasive creaky voice.3

We believe that this methodology will prove to be a useful alternative to list-reading experiments on one hand and data mining of large-scale natural-speech corpora on the other.

3 The dialogue method also helped Dutta and Hock (2006) observe that the unmarked situation in Bangla conforms to the cross-linguistic tendency for utterance-final verbs in SOV languages to avoid prominence. This avoidance is based on two well-established cross-linguistic tendencies — an avoidance of utterance-final prominence and an accentability hierarchy.
Appendix

Background description for the dialogue experiment, plus a sample of the dramatic instructions.

Jean and John are in their late twenties and have been married three years. John is a Mac OS X software developer at a startup company and Jean is a research physicist for a company that develops machine vision systems for industrial applications.

They are very energetic people who enjoy rock climbing and hiking with their dog Mack. Jean also likes decorating the house; they sometimes argue about just how much money should be spent on interior decorating. Although they’ve been married three years, Jean and John still act like newlyweds, using each others’ names a lot in conversation and always holding hands and kissing in public.

Dialogue I

[It’s late Saturday morning. John, who often works from home, is in the downstairs study trying to find a bug in an application he’s just finished writing. Jean, who doesn’t bring work home because her company is paranoid about industrial espionage, is upstairs doing pullups on a hangboard.]

John: Jean, could you check the mail for me?
Jean: Why don’t you do it yourself, John?
John: I really need to get this work done, Jean, and the computer is giving me trouble.
Jean: OK, OK, I’ll go ahead and check the mail, John.
[Jean goes to check the mail, grumbling a bit, and returns.]
Sorry, no sign of the mail yet.
John: That’s weird. Normally the mail comes in by this time. Maybe we have a new mailman.
[Exit Jean; some time elapses. Jean, having finished her hangboard workout, has just stepped out of the shower and is trying to get ready to go out and meet a friend for lunch.]

John: Jean, could you go and check the mail again?
Jean: OK, but after that you’re on your own, John.

[Jean goes to check the mail, grumbling a bit more than before, and returns.]
Nothing yet

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