# Experiment 1: Palatography

## 1. Introduction

In this experiment, we're going to use the palatographic technique described in Ladefoged & Maddieson (1996) for determining where in the mouth a sound is articulated to examine how the place of articulation of nasal consonants varies as a function of the following consonant's place. This technique involves painting the tongue with a mixture of charcoal powder and olive oil,[1] having the speaker pronounce the sounds of interest, and then photographing the reflection of the roof of the mouth in a mirror.

## 2. Method

Detailed procedures will be demonstrated in class on Monday, 10 September 2007. Briefly:

a. The tongue is painted with a mixture of charcoal and olive oil,
b. The speaker pronounces the word of interest,
c. A mirror is inserted in the mouth so that its roof is reflected,
d. A photograph is taken of the reflection in the mirror,
e. The speaker rinses the mouth thoroughly with water, and the procedure starts again at (a).
f. Once all the items have been photographed, the photographs are downloaded to a computer and transferred to a CD.

The speaker should open the mouth immediately after saying the word so that the marks on the palate are not disturbed before the photograph is taken. Ideally, one should be able to see where the tongue contacted the roof of the mouth by where charcoal traces have been left.

One photo should be taken with a ruler placed along the roof of the mouth, so you can determine how far from the teeth a sound is articulated.

You will work in groups of four on this exercise. Two people will act as speakers and two as experimenters. The final report will come from all four people in a group.

[1] Charcoal is tasteless and actually good for the stomach, and olive oil has a mild taste, so this should not be unpleasant.

The words that you will record are:

| Control words | Test words |
|---|---|
| inner | |
| offer | infer |
| author | panther |
| awesome | answer |
| assure | ensure |

The control words show how an [n] is pronounced when no consonant follows it and how the various following consonants are pronounced when not preceded by [n]. The test words have clusters of [n] followed by labiodental [f], (inter)dental [θ], alveolar [s], or post-alveolar [ʃ]. We want to collect two clear photographs of the palate from each speaker for each of these nine words, i.e. 18 photographs from each speaker.

3. Reporting results

By comparing the images of the palate of the test words with those of the control words, you should be able to describe how the pronunciation of [n] varies as function of the sound that follows it. You can use the image of the ruler to quantify how far from the teeth the sound is pronounced. Your report should be a description of what variation you observe, including an comparison between your two speakers, and an explanation of why the [n]'s pronunciation varies in this way. A CD with the images you collected should accompany the report.