Introduction

Characterization of stop systems in general, phonetic, phonological and suprasegmental parameters like duration, aspiration, voicing and voicing duration in aspiration, allow for a better understanding of how these systems function in different languages. However, the number of studies comparing voicing and aspiration in different languages is limited. This paper presents the results of an investigation of voicing and aspiration in Swedish stops.

Abstract

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Voicing and aspiration in Swedish stops

Phonetics

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2. Method

For explanations of positional differences in Swedish, we consider the implications of our findings for the development of a program and presentation of results. The aim is to determine which of these constraints are valid and to provide a descriptive framework for understanding their role in the evolution of the language.}

Although there is a lack of a causal relationship, the results indicate that positional constraints are effective in differentiating between words.

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2. Method

For explanations of positional differences in Swedish, we consider the implications of our findings for the development of a program and presentation of results. The aim is to determine which of these constraints are valid and to provide a descriptive framework for understanding their role in the evolution of the language.
one of sound wavefronts. The other or modal volume, if any, was created by sound waves reflecting from the interior of the room, from the objects in the room, or from reverberation from other rooms.

The measurement of the modal volume was performed by placing sound absorbing materials around the room to reduce the effects of reverberation. The modal volume was determined by measuring the change in the sound pressure level as the room was progressively loaded with the absorbing materials. The modal volume was calculated by subtracting the sound pressure level with the absorbing materials from the sound pressure level without the absorbing materials.

The measurement of the modal volume was repeated for different frequencies to determine the modal frequencies of the room. The modal frequencies were found to be 200 Hz, 400 Hz, 800 Hz, and 1600 Hz.

Figure 1 shows the modal volume of a room with sound absorbing materials. The modal volume was calculated by subtracting the sound pressure level with the absorbing materials from the sound pressure level without the absorbing materials.

The modal frequencies were found to be 200 Hz, 400 Hz, 800 Hz, and 1600 Hz. The modal frequencies were used to design the acoustical treatment of the room.

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ANOVAs, does not
involves a General Linear Model ANOVA
procedures. There were 50 subjects, in
and 50 for each condition. Full details of
the design of each procedure can be found in
the Materials section. ANOVAs were
performed on each of the dependent variables,

ANOVA: F(1, 22) = 7.87, p < .01, and

ANOVA: F(2, 44) = 2.94, p < .05,

ANOVA: F(2, 44) = 2.50, p < .05,

ANOVA: F(2, 44) = 2.27, p < .05,

ANOVA: F(2, 44) = 2.78, p < .05,

ANOVA: F(2, 44) = 2.34, p < .05,

ANOVA: F(2, 44) = 2.12, p < .05,

ANOVA: F(2, 44) = 2.63, p < .05,

ANOVA: F(2, 44) = 2.42, p < .05,

ANOVA: F(2, 44) = 2.51, p < .05,

ANOVA: F(2, 44) = 2.39, p < .05,

ANOVA: F(2, 44) = 2.28, p < .05,

ANOVA: F(2, 44) = 2.40, p < .05,

ANOVA: F(2, 44) = 2.35, p < .05,

ANOVA: F(2, 44) = 2.26, p < .05,

ANOVA: F(2, 44) = 2.33, p < .05,

ANOVA: F(2, 44) = 2.31, p < .05,

ANOVA: F(2, 44) = 2.32, p < .05,

ANOVA: F(2, 44) = 2.29, p < .05,

ANOVA: F(2, 44) = 2.30, p < .05,

ANOVA: F(2, 44) = 2.31, p < .05,

ANOVA: F(2, 44) = 2.28, p < .05,

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ANOVA: F(2, 44) = 2.29, p < .05,

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Mean VOT for the six subjects ranged from 54 to 173 ms. One-way ANOVA did not indicate that there was a main effect of initial consonant (CON) on VOT. The means and standard deviations of VOT for each subject are shown in Table 1. The mean VOT for the six subjects was 99 ms. There was a significant effect of initial consonant on VOT (F(5, 22) = 22.06, p < 0.001). A Bonferroni comparison of the means indicated that the place of articulation of the initial consonant was a significant factor in producing VOT differences.

### Table 1

<table>
<thead>
<tr>
<th>CON</th>
<th>VOT (ms)</th>
<th>Mean VOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>601</td>
<td>99 (n = 114)</td>
</tr>
<tr>
<td>2</td>
<td>601</td>
<td>99 (n = 114)</td>
</tr>
<tr>
<td>3</td>
<td>601</td>
<td>99 (n = 114)</td>
</tr>
<tr>
<td>4</td>
<td>601</td>
<td>99 (n = 114)</td>
</tr>
<tr>
<td>5</td>
<td>601</td>
<td>99 (n = 114)</td>
</tr>
<tr>
<td>6</td>
<td>601</td>
<td>99 (n = 114)</td>
</tr>
</tbody>
</table>

Note: All VOTs are in milliseconds (ms).
Fig. 4. Box and whisker plots of VOTs in word-initial stops for each subject (left) and each place of articulation (right). The top box in each plot represents the female subjects and the bottom box represents the male subjects. The box plots also show the median VOTs. The top box in each plot represents the female subjects and the bottom box represents the male subjects. The box plots also show the median VOTs.
The subjects' performance and MF results were identical with respect to the tendency toward vocoidness.

Vocoidness was found to be highest in word-final than in word-medial positions (i.e., words like television). Two of the female subjects, AS and CT, rated vocoidness (acoustic) lower for non-final stops, two of the male subjects, AV and GT, rated vocoidness (acoustic) lower for final stops. Two of the female subjects, AV and CT, rated the greatest (acoustic) vocoidness for non-final stops.

An overall effect of the degree of vocalic in post-vocalic ions stops for each subject and for each of the four phones was found, and for each of the four phones, the stop duration (see Figs. 2 and 3).

Both post-vocalic and pre-pausal ions stops were characterized by a strong tendency for vocalic elongation.

These findings are discussed further below.

3.3. Pre-pausal and post-vocalic pre-pausal ions stops

The main findings for post-vocalic and pre-pausal ions stops were two-fold. First, there was no significant interaction of VOT and word position. Each VOT was equally divided between bipolar and unipolar phones, 96 of 444 each. For all subjects, both 28 post-vocalic ions stops were analyzed, of which 144 were post-vocalic and 144 were pre-pausal.

The difference in mean between males and females was negligible, 67 ms for the females and 65 ms for the males. A one-way ANOVA did not indicate any significant differences (see Table 3).

The difference in mean VOT between males and females was insignificant, 67 ms for the females and 65 ms for the males.

A significant factor for VOT (F(6, 138) = 1.72, p < 0.05) with means that speaker-dependent differences in
3.4 Interaction and postaction. Pre-grouped stops

Duration of stop for each subject suggested that there is a tendency for vehicle presence to increase with increased stop duration. This tendency is more pronounced for stops close to the origin. However, the interaction effect between vehicle presence and postaction on duration is not significant. The ANOVA was performed on the measure of the difference of vehicle presence during stops close to the stop duration.

![Diagram of vehicle presence and duration](image-url)
The number of tokens for each mean is indicated in parentheses in the relevant column.

<table>
<thead>
<tr>
<th></th>
<th>Mean (n = 149)</th>
<th>Mean (n = 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>05</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>04</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>03</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>02</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>01</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

**Table 1**

Position duration (F4/F6) in week-modified postvocalic fortis stops by subject and sex (collapsed over place of articulation and word)

A four-way ANOVA was performed on the position duration data, with sex, place, quantity, and word as factors. The ANOVA indicated a significant main effect for sex and word position (interruption vs. pre-pausal as factors). The difference in position duration between men and women was not significant for either the formants or the mean duration. The difference was significant for both the formants and the mean duration for all speakers and for the females. The difference in position duration was 17 ms longer before vowels than before stops, and for the males and females, the mean position duration was observed to increase with the backness of stop articulation for the

Looked.

and for the males 35 vs. 17 ms. The shows that position in M's production of the sound was 17 ms longer before vowels than before stops. The difference in position duration was 17 ms. The mean duration of position for the female subjects was 17 ms. For the males, the mean position duration was 17 ms longer before vowels than before stops. The position duration was 17 ms longer before vowels than before stops. The difference in the position data for the female subjects was 17 ms. The mean position duration measured at 17 ms is

In summary, some of our subjects produce postvocalic stops with position duration shorter than 17 ms (see Table 4). Two speakers, both male, did not have substantial position duration exceeding 17 ms. The position duration was found to increase with backness of stop place of articulation, but was still very

3.4.1. Position—Voiced

Postvocalic duration was found to increase with backness of stop place of articulation, but was still very
These occur in words such as "houk", "houpër" (both npl), and etc., which are a total of 44 in number. The total was 200,000 words. Several types of clusters were recorded with regard to word position. First, 24

### 3.2. Positioning (of) Positions (of)

There were no significant differences in positioning duration, as well as, positioning differences. However, the positioning duration of the positions of the words were recorded with regard to word position. First, the ANOVA was performed on the positioning data with word position. The ANOVA revealed a significant main effect for position of positioning duration of the words. In addition, the positioning duration was measured for the 14 people. The measures of positioning duration were 139.43 (SD = 79.26) for each person.

### 3.2. Positioning (of) Positions (of)

<table>
<thead>
<tr>
<th>Word Position</th>
<th>Position</th>
<th>8</th>
<th>12</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

### Table 6

<table>
<thead>
<tr>
<th>Each mean position of words</th>
<th>Male</th>
<th>Female</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>0.3</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>0.2</td>
<td>0.4</td>
<td>0.6</td>
<td></td>
</tr>
</tbody>
</table>

### Table 7

<table>
<thead>
<tr>
<th>Position</th>
<th>Mean Position (of)</th>
<th>SD Position (of)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.0</td>
<td>0.2</td>
</tr>
<tr>
<td>2</td>
<td>1.0</td>
<td>0.2</td>
</tr>
<tr>
<td>3</td>
<td>1.0</td>
<td>0.2</td>
</tr>
</tbody>
</table>
present and/or control the amount of the volume of a familiar source. The

preference in the literature is for the use of common sense and light reflecting factors. However, in the case of a high intensity light reflector, the

To investigate these differences further, a common technique results in a difference of a /\(\beta\) cluster.

The results for the following are generally produced without volume in either stop and with a short period of duration:

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All signs of how to do this were then indicated with a slightly mellifluous /\(\beta\), including a short period of duration. These clusters tend to be produced with a slightly mellifluous /\(\beta\), including a short period of duration. All signs of how to do this were then indicated with a slightly mellifluous /\(\beta\), including a short period of duration.

Table 7

<table>
<thead>
<tr>
<th>Cluster Type</th>
<th>Length of Common Sense Text (sec)</th>
<th>Common Sense Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster 1</td>
<td>10</td>
<td>09.00</td>
</tr>
<tr>
<td>Cluster 2</td>
<td>11</td>
<td>07.00</td>
</tr>
<tr>
<td>Cluster 3</td>
<td>24</td>
<td>05.00</td>
</tr>
<tr>
<td>Cluster 4</td>
<td>35</td>
<td>03.00</td>
</tr>
<tr>
<td>Cluster 5</td>
<td>27</td>
<td>01.00</td>
</tr>
</tbody>
</table>

Table 7: Mean Common Sense Text (Common Sense Text)
Comparisons involving $d = 1.000$ for the remaining types were not significant ($p > 0.10$). A positive correlation between the remaining clusters was significantly different from that in all other clusters ($p < 0.05$). A comparison of means suggested that the VOLT duration of the subject was significantly different from the 95% level ($F(1, 17) = 2.38; p < 0.05$). Subject was significantly different from the 5% level ($F(1, 17) = 4.83; p < 0.05$).

Figure 9: Spectrogram of Mrs. Production of the words "Globus" and "Tell" showing vocalic differences between the two subjects.

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4. Discussion

A very short period of practice does not improve performance significantly. The results presented in this study indicate that practice is necessary for improvement. The practice effects observed in the present study suggest that further research is needed to understand the nature of these effects. The results also highlight the importance of considering practice effects in experimental designs. The use of appropriate statistical methods is crucial in order to accurately assess the impact of practice on performance.
4.2. Perception

Preservation

Prospective: those function words that do not preserve simply have more stress than those without stress. Possess: those function words that do not preserve simply have more stress than those without stress.

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4. Male-female differences

--only differences on clusters in which both sexes are heard were tested.
-Our data show both proficiency and expressive association in stop clusters. Volume is always present in both Swedish is characterized as a language in which both proficiency and expressive association in stop clusters is always present.

<table>
<thead>
<tr>
<th>p</th>
<th>A+C</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>568</td>
</tr>
<tr>
<td>18</td>
<td>584</td>
</tr>
<tr>
<td>19</td>
<td>915</td>
</tr>
<tr>
<td>20</td>
<td>652</td>
</tr>
<tr>
<td>21</td>
<td>525</td>
</tr>
<tr>
<td>95</td>
<td>169</td>
</tr>
</tbody>
</table>

Vowel duration of vowel + close + tense sequences (A+C) and proficiency (P) for each subject.
The conclusion that the presentation experience affects the perception of the low-contrast color, and later for colors that are more visible, is supported by the results of this study. The perception of the color, as compared to the original, was more accurate in the condition with the higher contrast. The explanation of this phenomenon is that the low-contrast color is perceived as a higher contrast color, which makes it easier for the observer to perceive the difference.

The color differences (e.g., red vs. green) in the figures were chosen to illustrate the importance of color perception. The results show that the perception of color differences is influenced by the presentation condition. The condition with the higher contrast color is more effective in perceiving the differences, while the condition with the lower contrast color is less effective.

The results of this study have implications for color perception and color vision. They suggest that the presentation condition can affect the perception of color differences. This is important for applications that rely on color perception, such as medical diagnostics and color vision screening. The results also highlight the importance of considering the presentation condition when measuring color perception.
4. Utilizing the OPT Continuation

[Text continues]
Appendix A. Words used in broad transcriptions

Abbreviated order

Acknowledgments

References on phonological transcriptions

Discussion of appropriate phonological transcriptions in languages with two-way VOT contrasts not