

Dissection of the Speech Production Mechanism

by

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Preface	
Introduction	i
1.The Respiratory Mechanism	1
2.The Lips	11
3.The Jaw and Related Structures	15
4.The Neck	21
5.The Brain and the Cranial Nerves	27
6.The Pharynx	39
7.The Tongue	45
8. The Larynx	53
9.The Velum	61
Appendix A: Glossary of Anatomical Terms	63
Appendix B: Muscles of the Speech Production Mechanism	67
Appendix C: Annotated Bibliography	81

Preface

One can have all the knowledge available from anatomical atlases and from textbooks on speech production, but none of it substitutes for the hands-on experience acquired in an anatomy laboratory. There is nothing comparable with actually seeing where the muscles of the tongue attach, feeling the comparative thickness of different muscles, moving the arytenoid cartilages to stretch the vocal folds, and holding a brain in one's hand.

The aim of this manual is to suggest ways of dissecting the human vocal apparatus that are appropriate for students of speech. It is designed as a short course that could be part of another, more classroom oriented, course. We hope we can encourage people working in speech pathology, phonetics, and communication sciences to find a co-operative medical department and try dissecting a human cadaver for themselves. Anatomy departments are often able to help, but we have found that a better solution is to contact people in Head and Neck Surgery, who are much more knowledgeable about the anatomy of the areas of interest to students of speech. Our best guides have been senior residents and surgeons. They have helped us go through the material in this manual in nine weekly meetings, although that has sometimes been rather rushed, and a full semester of practical work of this kind would be preferable.

This manual makes no attempt to give a detailed account of the anatomy and physiology of the speech production mechanism, presuming that is part of some other, more classroom oriented, course. Each section begins with a brief review of the actions of the different muscles that will be seen in the dissection, and the functions of different parts of the speech apparatus. But these reviews are intended simply as reminders of the information that can be found in more comprehensive books. This is a book to take into the laboratory and have in gloved hands while actually dissecting. Most of the illustrations are drawings of actual cadavers in the positions in which they are being dissected, not the upright human beings seen in many anatomical diagrams.

We assume that most readers will be students of speech, and not of medicine. As a result we have used both standard medical terminology and more familiar English forms. Thus we have used medical expressions such as “superolaterally to inferomedially”, but we have also tried to help readers by noting that this means “from the upper outside to the lower inside”. We are aware that the maxilla is not exactly the same as the upper jaw, but it certainly helps students to be reminded that the two are roughly equivalent. We hope that those schooled in the Latinate medical terms will forgive our attempts to make this manual as readable as possible. As far as we know, there is no dissection guide primarily directed towards students of speech.

Much of the contents in standard dissecting manuals such as Grant's dissector (Sauerland, 1984) cover anatomical areas irrelevant to the mechanism of speech production, e.g. the arms, the legs, and most of the lower abdomen. Accordingly, we have tried to produce a method of dissection concentrating mainly on the thorax, the neck and the head. Even within this limited region we have severely limited our goals. Speech scientists do not need to know how the heart should be examined, nor the appropriate way of dissecting the eye. Throughout we have emphasized only those anatomical structures that are relevant to speech. We have also placed more

emphasis on the muscles rather than the nerves. For surgeons who are going to be operating on the larynx it is extremely important to know where the recurrent laryngeal nerve is likely to be, as it will be disastrous if they cut it. But for students interested in speech it is more important to know where the muscles are, what they are attached to, and what will happen when they contract.

It is difficult to say who are the authors of this book. This edition was edited and re-written by Melissa Epstein and Narineh Hacopian. Siri Tuttle researched and created new versions of all the illustrations. The manual is the cooperative effort of many generations of members of the UCLA Phonetics Lab and their colleagues in the Departments of Head and Neck Surgery and Anatomy. The first version published was UCLA Working Papers in Phonetics 77 in 1990, but that itself was the product of preceding classes. Since then the UCLA Phonetics Lab group has participated in many other dissection classes, each of them contributing to the final product. As far as we can discover, the principal participants include: Beatriz Amos, Victoria Anderson, Sean Boisen, Dani Byrd, Vanna Condax, John Choi, Sarah Dart, Ken deJong, Sandy Disner, Peter Duong, Edward Flemming, Karen Emmorey, Melissa Epstein, David Feldman, Victoria Fromkin, Juan Carlos Gallego, Bruce Gerratt, Robert Hagiwara, Narineh Hacopian, Kenneth Hill, Caroline Henton, Ren Hongmo, Kevin Hori, Marie Huffman, Sue Inouye, Michel Jackson, Patricia Keating, Jody Kreiman, Sun-Ah Jun, Jenny Ladefoged, Peter Ladefoged, Mona Lindau, Ian Maddieson, Rich Robison, Mike Suzuki, Bonny Sands, Siri Tuttle, Andrew Verneuil, Anne Wingate, Richard Wright and Ming Ye.