

Revised Study Questions for Chapter 10. Theories and Models of Speech Production

The following are the corrected versions of the study questions which should be used alongside Chapter 10 in the Fourth Edition of *Speech and Voice Science*.

10.1 Introduction

1. Broadly, what is meant by speech motor control?
2. What are some of the organizational categories of questions we might ask regarding speech motor control?

10.2 Theories and Models

3. What are the differences between a theory and a hypothesis?
4. What is a model and what forms can a model take?

10.3 Theoretical Issues for Consideration

5. Explain the difference between potential and actual degrees of freedom of the vocal tract.
6. What is an output target, relative to theories of speech production? Can you name three possible targets? What evidence has been cited to support the theories for each of these three output targets?
7. What are motor programs? What are the two proposed levels of motor programs? Discuss two weaknesses of motor program theory and the theoretical response to those weaknesses.
8. Explain serial ordering and sensory feedback, including open and closed feedback loop.
9. Why is it challenging to determine the basic unit of analysis for speech motor control?
10. What are the possible movements of the mandible and the actual movements during speech production?
11. Define coarticulation.
12. Briefly describe the three theories of coarticulation.

10.4 Models of Speech Production

13. What is the major emphasis of the DIVA model? What do the letters DIVA stand for?
14. What is the primary objective of the dynamical systems model?
15. Explain the mechanism that constrains the potentially infinite number of degrees of freedom of the speech production system to a few useful (effective) degrees of freedom.
16. Explain frame of reference, path, and trajectory relative to spatiotemporal organization. What are three difficulties in describing spatiotemporal organization of articulatory movements.
17. What are the connectionist models?

10.5 Investigational Considerations

18. What are some of the relevant factors in the discussion of speaking task in speech motor control research?
19. How are adaptations to perturbation explored in speech motor control? Include expected and unexpected perturbations, as well as transient and static disruptions.

20. How have the data from perturbation studies been used to support different theories of speech motor control?
21. How is variability of articulator movement influenced by speaking rate?
22. Define “clear speech” and describe its acoustic features.

10.6 Motor Learning Principles

23. What is meant by motor learning principles?
24. What are some of the practice and feedback variables that can influence skills acquisition and retention?

10.7 Language and Speech

25. What are the two views of how the speech production system adapts to increases in processing complexity?
26. Briefly explain how the slot and filler model and the frame and content theory account for speech production errors.