**Chapter 10 Study Guide: Hearing in the Environment**

Vocabulary

* Interaural time difference- sounds reach the closer ear slightly earlier than the further ear. Humans can sense as small as .01ms: allows us to detect where a sound is coming from.
* interaural level difference- the difference in intensity (level) between a sound arriving at one ear v. another.
* sound localization- distance influences timing, frequency and amplitude. Surroundings also influence, like reflections and baffling.
* sound shadow- for frequencies >1000 Hz the head blocks frequencies. Sounds louder on the side pointing towards the source but this will not work for low frequencies.
* cone of confusion-all sounds at the same angle from the interaural axis will generate the same shadow and delay. In real life we move our heads to solve this problem.
* perceptual restoration- sounds are perceived as continuous if noise fills gaps. This is an example of good continuation.
* spectral composition- distance and pitch is the “spectral composition”. The are absorbs higher frequencies so distant sounds are dominated by lower frequencies. A nearby crack sounds like a boom from further away (thunder).
* Head related transfer function- a function that describes how the pinna, ear canal, head and torso change the intensity of sounds with different frequencies that arrive at each ear from different locations in space. Sound intensity, timing and shape determine this function and it allows us to localize sound.

Sound components

* + There is more in this chapter on timbre and harmonics, however it was discussed above so I don’t want to be redundant.
	+ Attack- the part of a sound during which amplitude increases (onset)
	+ Decay- the part of a sound during which amplitude decreases (offset)
	+ Sustain- the constant volume that the sound takes after decay until the note is released.
	+ Release- how quickly the sound fades when a note ends.
	+ Octave- a tone that is 8 steps above or below another tone.
	+ Doppler effect- the pitch of a sound gets higher when we are getting closer to it and it gets lower when we are going away from it. Influenced by relative motion and wavelength and speed.

What is source segregation and what does it involve?

* Auditory scene analysis is another word for this
* Most sounds are complex and generate many frequencies and most environments contain many sound sources. The cochlea responds to the sum of all environmental sounds. This divides the world into separate channels (objects)
* Sound location: sounds coming from different locations are generated by different sources.
* A single source is called an auditory stream. When sounds are similar they are grouped as one stream.
* Similar frequencies are grouped together.
* Similar timbres are grouped together
* Sounds with a similar time of onset are grouped together.
* Examples?