Appendix A: ROC Curves

The *receiver operating characteristic* (ROC) curves are used to capture at a glance both the level of discrimination (d') and the decision criterion (for instance, β). An ROC curve is obtained when plotting the probabilities of a hit, on the ordinate, and the probabilities of a false alarm, on the abscissa (Fig. A.1).

The sensitivity of an observer will be revealed by the distance of the curve from the diagonal, which represents the case where $d' = 0$. Furthermore, the observer's response bias is revealed by the location of a point on a given curve. The performance of a lax observer, i.e., of someone with a high rate of hits and false alarms, is represented by a point in the upper right of the curve, whereas the performance of a conservative observer is represented by a point in the lower left.

There are specific ways to move the decision criterion of an observer, i.e., to change the location of a point on a given ROC curve. One of these ways is to assign rewards (e.g., giving participant money) for each hit and to administer punishment (asking participant for money) for each false alarm. Depending on the value of rewards and punishments, the observer will adjust the criterion. If there is more money involved for a hit than for a false alarm, the observer will adopt a lax criterion (the point will move up and to the right on the ROC curve). Conversely, observers will become much more conservative in their way of making decisions in conditions where it is necessary to pay more for a false alarm than what could be obtained for a hit. It is important to remind that the movements of the criterion do not affect sensitivity.

Note in conclusion that the ROC curves are also used to test some assumptions underlying the signal detection theory. For example, with the transformation of proportions into *Z*-scores, it becomes possible to determine whether the distribution noise and signal + noise are normal and whether their variance is the same. In the first case (normal distributions), for a given ROC curve transformed into *Z*-scores, the points should fall on or near the linear function, and in the second case (equal variance assumption), the slope of this function should be 1.

S. Grondin, *Psychology of Perception*, DOI 10.1007/978-3-319-31791-5

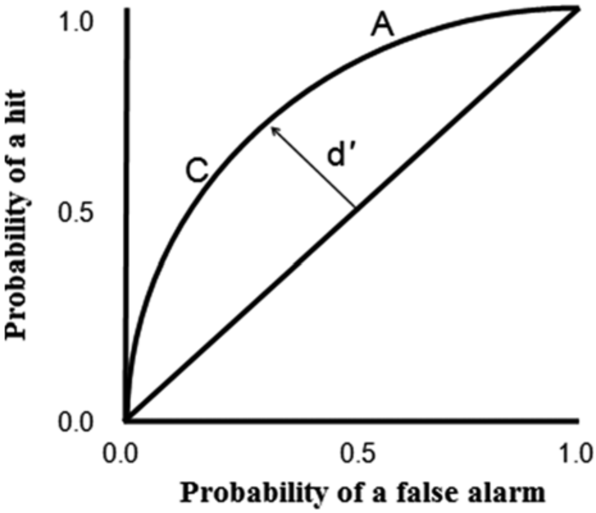

Fig. A.1 On this *receiver operating characteristic* (ROC) curve, sensitivity (*d′*) is the same everywhere. C is a conservative observer and A is a lax observer. C and A would therefore have a different criterion

Appendix B: Fechner's Law

Founder of psychophysics, Gustav Fechner was interested in the nature of the relationship between the magnitude of a stimulus and the magnitude of sensation. Fechner believed that this relationship was bound to be logarithmic. Indeed, to establish the relationship, he postulated that the magnitude of the sensation can be described by a unit called the just-noticeable difference (JND), which itself could be quantified indirectly on the basis of the Weber fraction. The 0 point of his psychological scale is the absolute threshold.

Thus, for a sensory continuum having an absolute threshold equal to 10 (arbitrary units) and a Weber fraction of 0.3, the calculation of the scale is as follows:

JND	Value (in log)
1 = 10 + (10 × 0.3) = 13	(1.114)
2 = 13 + (13 × 0.3) = 16.9	(1.228)
3 = 16.9 + (16.9 × 0.3) = 21.97	(1.342)
4 = 21.97 + (21.97 × 0.3) = 28.56	(1.456)
5 = 28.56 + (28.56 × 0.3) = 37.13	(1.570)
6 = 37.13 + (37.13 × 0.3) = 48.27	(1.684)
And so on	

In short, to achieve a JND, the stimulus in this example must have a value of 13. The next JND occurs when the intensity is 16.9. Reported graphically, these values show that the relationship between JND, on the *y*-axis, and the value of stimuli, on the *x*-axis, increases logarithmically (Fig. B.1, left). If it is rather the logarithmic value of stimuli that is used on the *x*-axis, the relationship becomes linear (Fig. B.1, right).

This logarithmic relationship can be summarized in the following equation:

$$\text{JND} = K \log \phi$$

where JND is the sensation, K is a multiplicative constant whose value is related to a given modality and a given sensory dimension, and ϕ is the stimulus intensity above the absolute threshold.

S. Grondin, *Psychology of Perception*, DOI 10.1007/978-3-319-31791-5

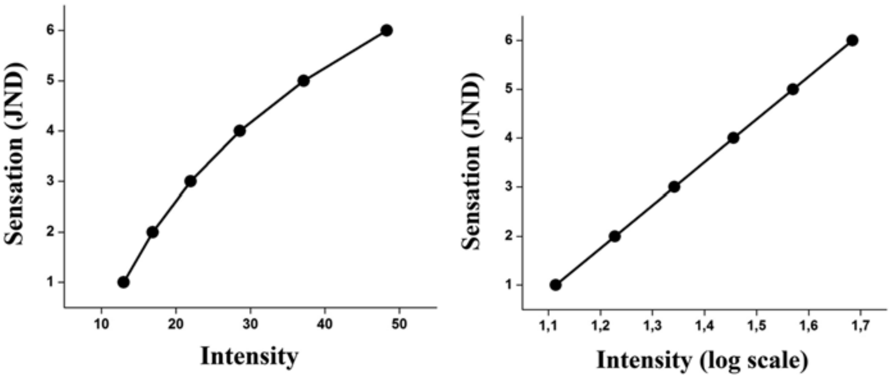

Fig. B.1 Relationship between the value of a "just-noticeable difference" (JND) and the intensity of the stimuli on the linear scale (on the *left*) and on a logarithmic (on the *right*)

In the mind of Fechner, the fourth JND corresponds to something that is psychologically twice as high as the second JND. This indirect way of establishing the link between sensation and the physical magnitude was incorrect, especially considering the fact that the Weber fraction is not constant, being higher for low physical magnitudes. The direct way in which Stevens addressed the issue of the relationship between the magnitude of a stimulus and the sensory magnitude was proved to be more fruitful.

Appendix C: The Nervous System

The study of the nervous system requires many nuances. Nevertheless, tracing the main lines of the anatomy of the nervous system should allow to develop a clear view of the link between the peripheral activity of the sensory receptors and the one occurring at higher levels of processing, that is, those that lead to the brain.

The nervous system is divided into the central nervous system and peripheral nervous system. The main parts of the central nervous system are described below. The peripheral nervous system includes the autonomic nervous system (which consists of the sympathetic and parasympathetic systems) and the somatic nervous system. The latter is particularly interesting because it includes the nerves.

C.1 Nerves

Neurons are the basic units of the nervous system because they allow the transmission of nerve impulses and therefore the transmission of the information throughout the body. The nerves are groups of axons in the peripheral nervous system, the axon of the neuron being the prolongation of cell body up to many ramifications.

The nerves are in charge of the transmission of nerve impulses from receptors to the spinal cord. The peripheral nervous system is composed of 12 pairs of cranial nerves and 31 pairs of spinal nerves. Cranial nerves, which are designated by numbers I to XII, also have a name providing information about their function. Some nerves are strictly efferent, others strictly afferent, and others, like the trigeminal (V), have both functions. In the context of the study of sensation and perception, it should be emphasized that nerves I, II, and VIII are, respectively, associated with olfaction, vision, and hearing. In the latter case, it is more specifically the vestibulocochlear nerve, indicating that a branch of the nerve is assigned to the vestibular system, which is located in the inner ear.

S. Grondin, *Psychology of Perception*, DOI 10.1007/978-3-319-31791-5

Spinal nerves are determined according to the height where they are located on the spine: cervical (1–8), thoracic (1–12), lumbar (1–5), sacral (of 1–5), and coccygeal (1) nerves. Each of these nerves innervates a band (or segmented area) of the skin called dermatome.

C.2 Central Nervous System

C.2.1 Major Divisions

The central nervous system includes the encephalon and spinal cord. The encephalon is the general term which includes the brain, brain stem, and cerebellum. Suffice it here to recall that the brain includes the cerebral cortex (or the forebrain), in addition to important structures (the limbic system, thalamus, and hypothalamus). Just below the brain is the brainstem which includes, from top to bottom, the midbrain, the pons, and the bulb. The cerebellum is located just behind the brainstem and the spinal cord is located just below the brainstem. Table C.1 summarizes the main divisions of the central nervous system.

C.2.2 Cerebral Cortex

Different areas of the cerebral cortex are specialized in specific functions. For locating these areas easily, it is useful to identify, in Fig. C.1, the central and lateral fissures (or sulcus) on the cortex, as well as the four lobes: frontal, occipital, parietal, and temporal. Just before the central fissure are the motor cortex and premotor cortex, and just behind, we find the somatosensory cortex, which is itself divided into two areas, called primary and secondary. The primary somatosensory cortex receives

Table C.1 Divisions of the central nervous system and some associated terms

Encephalon = brain + brain stem + cerebellum
Brain = cerebral cortex + limbic system + thalamus + hypothalamus
Brainstem = midbrain + pons + bulb
Telencephalon (or cerebral cortex)
Diencephalon (thalamus + hypothalamus)
Mesencephalon (or midbrain)
Metencephalon (pons)
Myelencephalon (bulb)
Forebrain = telencephalon + diencephalon
Midbrain = mesencephalon
Hindbrain = pons + bulb + cerebellum

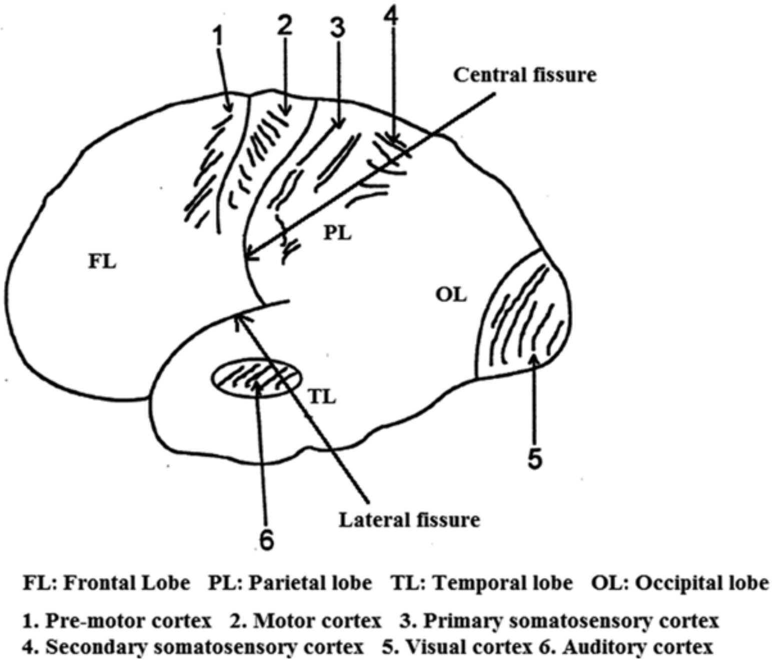

Fig. C.1 Main functional areas of the cerebral cortex

information directly from the receptor organs, whereas the secondary somatosensory cortex receives only information that has previously been processed elsewhere in the brain, including in the primary somatosensory cortex. The auditory cortex is located in the temporal lobe, while the different divisions of the visual cortex are located on the back, in the occipital lobe.

C.2.3 The Spinal Cord and Sensory Pathways

The spinal cord is the part of the central nervous system, protected by the spine, which provides communication (i.e., the transmission of nerve impulses) between the peripheral nervous system and the brain and between the brain and effectors (muscles). If one makes a cross section of the spinal cord, it is possible to observe several columns which are actually groups of numerous axons. These columns are ascendant (or afferent) when assigned to the transmission of information from the periphery to the brain or descendant (or efferent) when assigned to the transmission of nerve impulses from the brain to effectors (muscles).

Figure C.2 allows to distinguish a ventral part (or anterior), toward the front, and a dorsal part (or posterior), toward the back. What is on the sides is called lateral.

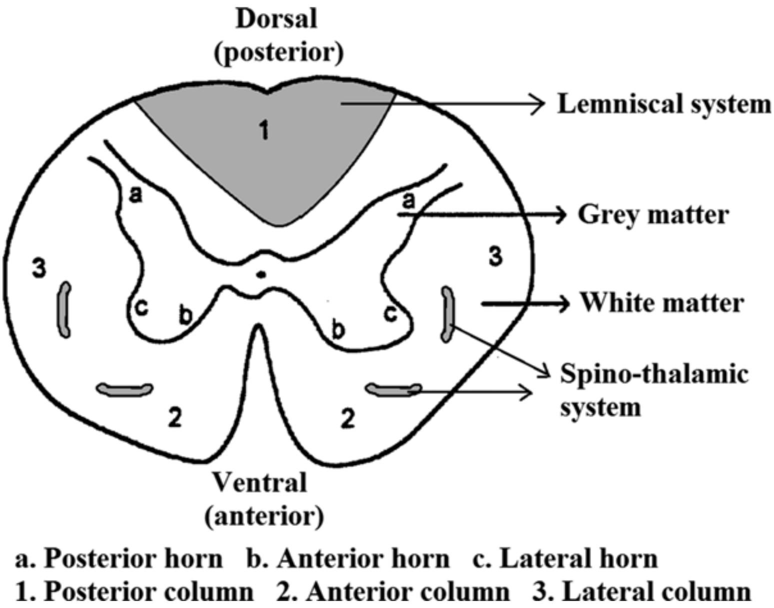

Fig. C.2 Cross section of the spinal cord

This helps to identify the dorsal, ventral, or lateral horns, located in the gray matter of the spinal cord, and the dorsal, ventral, or lateral columns, located in the white matter.

There are two main pathways responsible for transmitting sensory information. Both systems differ by the exact location where there circulates the nerve impulse and by the type of information that is conveyed. To easily understand the path of the nerve impulse from the receptors to the brain receptors, it is important to remember that the information received on one side of the body, left or right, is transferred in the contralateral side, right or left, of the brain. The transfer of information from one side of the body to another sometimes occurs at the level of the spinal cord, i.e., immediately at the level where the sensation is produced. This is the case of the spinothalamic system (or extralemniscal system): information crosses from one hemibody to the other upon entry into the spinal cord and is routed directly to the thalamus where there is a relay (synapse) with another neuron. From there, the nerve impulse is sent to an area of the cerebral cortex specialized in somesthesia. At the level of the spinal cord, the influx travels though the anterolateral part.

A portion of the sensory information follows a different route to reach the somatosensory cortex. This other pathway is characterized in that the transfer of nerve impulses from one side of the body to another does not occur at the level of the spinal cord, but much higher in the nervous system, namely, at the bulb level. After crossing at the bulb, there is also a synapse, before the projection in the

Table C.2 Central pathways used for the transmission of sensory information

Spinothalamic system	Lemniscal system
Tickling and itching	Sensations caused by vibrations
Pain	Sensations of friction against the skin
Diffuse sensations of tact or pressure	Sensation of body position in space
Sexual sensations	Sensations of fine touch
Thermal sensations	

somatosensory area, at the thalamus level. This path is called the dorsal column system (or lemniscal system) and is located in the posterior part of the spinal cord. Table C.2 indicates which pathway (spinothalamic or lemniscal) is used by different sensations for reaching the brain.

C.3 Methods for Studying Brain

Even though this information goes slightly beyond the scope of this book, it is worth recalling the main techniques used to ascertain the relationships between brain structures and different sensory, perceptual, or cognitive functions.

As early as the nineteenth century, links were established between brain damage or removal of certain groups of neurons and affected functions. It is now possible to create lesions, in animals, to test hypotheses about the role of the specific brain areas that are damaged. Similarly, since the mid-twentieth century, neurophysiology techniques were developed for implanting microelectrodes to collect the activity of single neurons and their role in sensory physiology.

Nowadays, there are many techniques that allow to draw a general picture, or an image, of brain activity. Generally, they allow or have a fair idea of the location of a structure involved in the function tested or a fair idea regarding when a cerebral contribution occurs. Thus, for nearly 50 years, surface electrodes (on the scalp) were used to measure electrical activity in the brain. This method, called electroencephalography (EEG), reflects the average activity of certain parts of the brain and how this activity changes over a given period. A particular form of this EEG activity is called evoked potentials. These analyses allow to linking quite precisely in time a change in electrical activity and the presentation of sensory stimuli. The electrical activity of the brain also produces small magnetic fields. Thus, a relatively new technique, called magnetoencephalography (MEG), captures the magnetic activity and offers, in addition to a good temporal resolution as is the case for EEG, better spatial resolution since magnetic activity is less vulnerable than the electrical activity captured by the surface electrodes to the distortions caused, for example, by the skull.

Among the tools offered by technology to researchers in neuroscience, there is positron emission tomography. This technique, available for 50 years, measures the metabolic activity of the brain using radioactive tracers. It allows to locate some functions, but offers poor temporal resolution. The 1990s saw the emergence of a technique called functional magnetic resonance imaging. This technique, which does not require the use of radioactive substances, is based on the metabolic changes within the brain. It is thus possible to link the blood flow, as well as the amount of oxygen required by neurons, with some perceptual or cognitive activity. This technique allows a very high spatial resolution.

We can now count on neuromodulation techniques to better understand the properties of the brain. One of these techniques, the transcranial magnetic stimulation, has been available since the mid-1990s. This is a technique where one can create for a short time, with small magnetic pulses, a change in brain activity. One can, for example, create a temporary inability to use a small area of the brain and see how it affects a perceptual or cognitive ability. Even more recently, it has become possible to use *transcranial direct-current stimulation* (tDCS), a noninvasive technique where the application of a small current passes through two electrodes: anode and cathode. The efficacy of tDCS depends on the position of the electrode and the intensity of the current. The anodal stimulation would increase synaptic transmission while cathodal stimulation would inhibit it.

References

Bagot, J.-D. (1996). *Information, sensation et perception*. Paris: Armand Colin.

Bausenhart, K. M., Rolke, B., & Ulrich, R. (2008). Temporal preparation improves temporal resolution: Evidence from constant foreperiods. *Perception & Psychophysics, 70*, 1504–1514.

Biederman, I. (1987). Recognition-by-components: A theory of human image understanding. *Psychological Review, 94*, 115–147.

Bonnet, C. (1986). *Manuel pratique de psychophysique*. Paris: Armand Colin.

Bowmaker, J. K., & Dartnell, H. J. A. (1980). Visual pigments of rods and cones in a human retina. *Journal of Physiology, 298*, 501–511.

Bowmaker, J. K., Dartnell, H. J. A., & Mollon, J. D. (1980). Microspectrophotometric demonstration of four classes of photoreceptor in an old world primate, *Macaca fascicularis. Journal of Physiology, 298*, 131–143.

Bregman, A. S. (1990). *Auditory scene analysis (The perceptual organization of sound)*. Cambridge, MA: MIT Press.

Broadbent, D. (1958). *Perception and communication*. London: Pergamon Press.

Bruce, V., Green, P. R., & Georgeson, M. A. (1996). *Visual perception (physiology, psychology, and ecology)* (3rd ed.). Sussex, England: Psychology Press.

Brungart, D. S., Durlach, N. I., & Rabinowitz, W. M. (1999). Auditory localization of nearby sources. II. Localization of a broadband source. *Journal of the Acoustical Society of America, 106*, 1956–1968.

Butler, R. A., Levy, E. T., & Neff, W. D. (1980). Apparent distance of sounds recorded in echoic and anechoic chambers. *Journal of Experimental Psychology: Human Perception and Performance, 6*, 745–750.

Calvert, G., Spence, C., & Stein, B. E. (2004). *The handbook of multisensory processes*. Cambridge, MA: MIT Press.

Campbell, F. W., & Robson, J. G. (1968). Application of Fourier analysis to the visibility of gratings. *Journal of Physiology, 197*, 551–566.

Chaudhuri, A. (2011). *Fundamentals of sensory perception*. New York: Oxford University Press.

Cherry, C. (1953). Some experiments on the recognition of speech with one or two ears. *Journal of the Acoustical Society of America, 25*, 975–979.

Coren, S., & Girgus, J. S. (1978). *Seeing is deceiving: The psychology of visual illusions*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Coren, S., Girgus, J. S., Ehrlichman, H., & Hakstian, A. R. (1976). An empirical taxonomy of visual illusions. *Perception and Psychophysics, 20*, 129–137.

Coren, S., Ward, L. M., & Enns, J. (2004). *Sensation and perception* (6th ed.). Toronto, Ontario, Canada: HBJ.

S. Grondin, *Psychology of Perception*, DOI 10.1007/978-3-319-31791-5

Cowan, N. (1995). *Attention and memory: An integrated framework*. New York: Oxford University Press.

Dalton, P., & Fraenkel, N. (2012). Gorillas we have missed: Sustained inattentional deafness for dynamic events. *Cognition, 124*, 367–372.

Delorme, A. (1982). *Psychologie de la perception*. Montréal, Québec, Canada: Études Vivantes.

Delorme, A., & Flückiger, M. (2003). *Perception et réalité (Une introduction à la psychologie des perceptions)*. Boucherville, Québec, Canada: Gaëtan Morin.

Desrochers, A. (1990). *Langage et processus cognitifs*. Manuel pour l'éducation à distance. Université Laurentienne, Sudbury, Ontario, Canada.

Deutsch, D. (2010, July). The paradox of pitch circularity. *Acoustics Today*, 8–15.

Deutsch, J. A., & Deutsch, D. (1963). Attention: Some theoretical considerations. *Psychological Review, 70*, 80–90.

DeValois, R. L., Abramovet, J., & Jacobs, G. H. (1966). Analysis of response patterns of LGN cells. *Journal of Optical Society of America, 56*, 966–977.

DeValois, R. L., & DeValois, K. K. (1975). Neural coding of color. In E. C. Carterette and M. P. Friedman (Eds.), *Handbook of perception* (Vol. 5, pp. 117–166). New York: Academic.

DeValois, R. L., & DeValois, K. K. (1988). *Spatial vision* (*Oxford Psychology Series*). New York: Oxford University Press.

Di Lollo, V., & Bischof, W. F. (1995). The inverse intensity effect in duration of visible persistence. *Psychological Bulletin, 118*, 223–237.

Diehl, R. L., Lotto, A. J., & Holt, L. L. (2004). Speech perception. *Annual Review of Psychology, 55*, 149–179.

Dowling, J. E., & Boycott, B. B. (1966). Organization of the primate retina: Electron microscopy. *Proceedings of the Royal Society of London. Series B: Biological Sciences, 166*, 80–111.

Dux, P. E., & Marois, R. (2009). The attentional blink: A review of data and theory. *Attention, Perception, & Psychophysics, 71*, 1683–1700.

Eimas, P. D., & Corbit, J. D. (1973). Selective adaptation of linguistic feature detectors. *Cognitive Psychology, 4*, 99–109.

Eisler, H. (1976). Experiments on subjective duration 1878-1975: A collection of power function exponents. *Psychological Bulletin, 83*, 185–200.

Epstein, W. (Ed.). (1977). *Perceptual stability and constancy: Mechanisms and processes*. New York: Wiley.

Fechner, G. (1966). *Elements of psychophysics* (H. E. Adler, D. H. Howes & E. G. Boring, Trans.). New York: Holt, Rinehart & Winston. (Original work published 1860)

Fletcher, H., & Munson, W. A. (1933). Loudness, its definition, measurement and calculation. *Journal of the Acoustical Society of America, 6*, 82–108.

Foley, H. J., & Matlin, M. W. (2010). *Sensation and perception* (5th ed.). Toronto, Ontario, Canada: Allyn and Bacon.

Galantucci, B., Fowler, C. A., & Turvey, M. T. (2006). The motor theory of speech perception reviewed. *Psychonomic Bulletin & Review, 13*, 361–377.

Gazzaniga, M. S., Ivry, R. B., & Mangun, G. R. (2009). *Cognitive neuroscience—The biology of the mind* (3rd ed.). New York: Norton.

Gescheider, G. A. (1997). *Psychophysics: Method, theory, and applications* (3rd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Gibson, J. J. (1966). *The senses considered as perceptual systems*. Boston: Houghton Mifflin.

Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin.

Gibson, E. J., Schapiro, F., & Yonas, A. (1968). Confusion matrices for graphic patterns obtained with a latency measure. *The analysis of reading skill: A program of basic and applied research*. (Final Report, Project No. 5–1213). Ithaca, NY: Cornell University and U.S. Office of Education.

Ginsburg, A. P., Evans, D. W., Sekuler, R., & Harp, S. A. (1982). Contrast sensitivity predicts performance in aircraft simulators. *American Journal of Optometry and Physiological Optics, 59*, 105–109.

Girgus, J. S., & Coren, S. (1975). Depth cues and constancy scaling in the horizontal-vertical illusion: The bisection error. *Canadian Journal of Psychology, 29*, 59–65.
Goldstein, E. B. (2010). *Sensation and perception* (8th ed.). Belmont, CA: Wadsworth.
Gray, J. A., & Wedderburn, A. I. (1960). Grouping strategies with simultaneous stimuli. *Quarterly Journal of Experimental Psychology, 12*, 180–184.
Gregory, R. L. (1997). Knowledge in perception and illusion. *Philosophical Transactions of the Royal Society of London, 352*, 1121–1128.
Grondin, S. (2001). From physical time to the first and second moments of psychological time. *Psychological Bulletin, 127*, 22–44.
Grondin, S. (2008). Methods for studying psychological time. In S. Grondin (Ed.), *Psychology of time* (pp. 51–74). Bingley, England: Emerald Group.
Grondin, S. (2010). Timing and time perception: A review of recent behavioral and neuroscience findings and theoretical directions. *Attention, Perception, & Psychophysics, 72*, 561–582.
Grondin, S. (2012). Violation of the scalar property for time perception between 1 and 2 seconds: Evidence from interval discrimination, reproduction, and categorization. *Journal of Experimental Psychology: Human Perception and Performance, 38*, 880–890.
Grondin, S., & Killeen, P. R. (2009). Tracking time with song and count: Different Weber functions for musicians and non-musicians. *Attention, Perception, & Psychophysics, 71*, 1649–1654.
Grondin, S., & Laflamme, V. (2015). Stevens's law for time: A direct comparison of prospective and retrospective judgments. *Attention, Perception, & Psychophysics, 77*, 1044–1051.
Grondin, S., & Laforest, M. (2004). Discriminating slow tempo variations in a musical context. *Acoustical Science & Technology, 25*, 159–162.
Gulick, W. L., Gescheider, G. A., & Frisina, R. D. (1989). *Hearing: Physiological acoustics, neural coding, and psychophysics*. New York: Oxford University Press.
Harmon, L. D., & Julesz, B. (1973). Masking in visual recognition: Effects of two-dimensional filtered noise. *Science, 180*, 1194–1197.
Hartline, H. K. (1940). The receptive fields of optic nerve fibers. *American Journal of Physiology, 130*, 690–699.
Hartline, H. K., & Ratliff, F. (1957). Inhibitory interaction of receptor units in the eye of limulus. *Journal of General Physiology, 40*, 357–376.
Hartmann, W. M. (1996). Pitch, periodicity, and auditory organization. *Journal of the Acoustical Society of America, 100*, 3491–3502.
Hellström, Å. (1985). The time-order error and its relatives: Mirrors of cognitive processes in comparing. *Psychological Bulletin, 97*, 35–61.
Hershenson, M. (Ed.). (1989). *The moon illusion*. Hillsdale, NJ: Lawrence Erlbaum.
Holway, A. H., & Boring, E. G. (1941). Determinants of apparent visual size with distance variant. *American Journal of Psychology, 54*, 21–37.
Honegger, M. (Ed.). (1976). *Science de la musique* (Vol. 1–2). Paris: Bordas.
Hubel, D. H., & Wiesel, T. N. (1959). Receptive fields of single neurones in the cat's striate cortex. *Journal of Physiology, 148*, 574–591.
Hubel, D. H., & Wiesel, T. N. (1962). Receptive fields, binocular interaction and functional architecture in the cat's visual cortex. *Journal of Physiology, 160*, 106–154.
Hubel, D. H., & Wiesel, T. N. (1968). Receptive fields, binocular interaction, and functional architecture in monkey striate cortex. *Journal of Physiology, 168*, 215–243.
Jesse, A., & Massaro, D. W. (2010). Seeing a singer helps comprehension of the song's lyrics. *Psychonomic Bulletin & Review, 17*, 323–328.
Johnston, W. A., & Dark, V. J. (1986). Selective attention. *Annual Review of Psychology, 37*, 43–75.
Kaufman, L., & Rock, I. (1962). The moon illusion. *Scientific American, 207*, 120–132.
Kilpatrick, F. P., & Ittelson, W. H. (1953). The size-distance invariance hypothesis. *Psychological Review, 60*, 223–231.
Klein, R. M. (2000). Inhibition of return. *Trends in Cognitive Sciences, 4*, 138–147.
Kluender, K. L., Diehl, R. L., & Killeen, P. R. (1987). Japanese quail can learn phonetic categories. *Science, 237*, 1195–1197.

Kuffler, S. W. (1953). Discharge patterns and functional organization of mammalian retina. *Journal of Neurophysiology, 16*, 37–68.

Kuroda, T., Nakajima, Y., Tsunashima, S., & Yasutake, T. (2009). Effects of spectra and sound pressure levels on the occurrence of the gap transfer illusion. *Perception, 38*, 411–428.

Larsen, E., Iyer, N., Lansing, C. R., & Feng, A. S. (2008). On the minimum audible difference in direct-to-reverberant energy ratio. *Journal of the Acoustical Society of America, 124*, 450–461.

Le Petit Larousse illustré 2011 – Dictionary (2010). Paris: Larousse.

Livingstone, M. S., & Hubel, D. H. (1987). Psychophysical evidence for separate channels for the perception of form, color, movement, and depth. *Journal of Neuroscience, 7*, 3416–3468.

Loftus, G. R., & Irwin, D. E. (1998). On the relations among different measures of visible and informational persistence. *Cognitive Psychology, 35*, 135–199.

Lortie, J.-Y., & Parent, G. (1989). *Psychologie de la perception—Notes de cours*. Sainte-Foy, Quebec, Canada: Université Laval.

Macdonald, J. S. P., & Lavie, N. (2011). Visual perceptual load induces inattentional deafness. *Attention, Perception, & Psychophysics, 73*, 1780–1789.

Mack, A., & Rock, I. (1998). *Inattentional blindness*. Cambridge, MA: MIT Press.

MacLeod, C. M. (1991). Half a century of research on the Stroop effect: An integrative review. *Psychological Bulletin, 109*, 163–203.

Macmillan, N. A., & Creelman, C. D. (1991). *Detection theory: A user's guide*. New York: Cambridge University Press.

Marr, D. (1982). *Vision: A computational investigation into the human representation and processing of visual information*. New York: Freeman.

Marr, D., & Nishihara, H. K. (1978). Representation and recognition of the spatial organization of three-dimensional shapes. *Proceedings of the Royal Society of London B, 200*, 269–294.

Martensa, S., & Wybleb, B. (2010). The attentional blink: Past, present, and future of a blind spot in perceptual awareness. *Neuroscience and Biobehavioral Reviews, 34*, 947–957.

McCollough, C. (1965). Adaptation of edge-detectors in the human visual system. *Science, 149*, 1115–1116.

McGurk, H., & MacDonald, J. (1976). Hearing lips and seeing voices. *Nature, 264*, 746–748.

Michael, C. R. (1978). Color vision mechanisms in monkey striate cortex: Dual-opponent cells with concentric receptive fields. *Journal of Neurophysiology, 41*, 572–588.

Miller, G. A. (1947). The masking of speech. *Psychological Bulletin, 44*, 105–129.

Miller, G. A., & Licklider, J. C. R. (1950). The intelligibility of interrupted speech. *Journal of the Acoustical Society of America, 22*, 167–173.

Musicant, A. D., & Butler, R. A. (1984). The influence of pinnae-based spectral cues on sound localization. *Journal of the Acoustical Society of America, 75*, 1195–1200.

Nakajima, Y., Sasaki, T., Kanafuka, K., Miyamoto, A., Remijn, G., & ten Hoopen, G. (2000). Illusory recouplings of onsets and terminations of glide tone components. *Perception and Psychophysics, 62*, 1413–1425.

Neisser, U. (1964). Visual search. *Scientific American, 210*(6), 94–102.

Niemi, P., & Näätänen, R. (1981). Foreperiod and simple reaction time. *Psychological Bulletin, 89*, 133–162.

Nisly, S. J., & Wasserman, G. S. (1989). Intensity dependence of perceived duration: Data, theories, and neural integration. *Psychological Bulletin, 106*, 483–496.

Palmer, S. E. (1992). Common regions: A new principle of perceptual grouping. *Cognitive Psychology, 24*, 436–447.

Patel, A. D. (2008). *Music, language, and the brain*. New York: Oxford University Press.

Penrose, L. S., & Penrose, R. (1958). Impossible objects: A special type of visual illusion. *British Journal of Psychology, 49*, 31–33.

Peretz, I., & Hyde, K. L. (2003). What is specific to music processing? Insights from congenital amusia. *Trends in Cognitive Sciences, 7*, 362–367.

Piaget, J. (1961). *Les mécanismes perceptifs*. Paris: PUF.

Posner, M. I. (1978). *Chronometric exploration of mind*. Hillsdale: Erlbaum.

Posner, M. I., & Cohen, Y. (1984). Components of visual orienting. In H. Bouma & D. Bouwhuis (Eds.), *Attention & performance X* (pp. 531–556). Hillsdale, NJ: Erlbaum.

Prinzmetal, W., & Gettleman, L. (1993). Vertical-horizontal illusion: One eye is better than two. *Perception & Psychophysics, 53*, 81–88.

Rafal, R. D., Calabresi, P. A., Brennan, C. W., & Sciolto, T. K. (1989). Saccade preparation inhibits reorienting to recently attended locations. *Journal of Experimental Psychology: Human Perception and Performance, 15*, 673–685.

Reed, S. K. (1982). *Cognition: Theory and applications*. Monterrey, CA: Brooks/Cole.

Rensink, R. A. (2002). Change detection. *Annual Review of Psychology, 53*, 245–277.

Rensink, R. A., O'Regan, J. K., & Clark, J. J. (1997). To see or not to see: The need for attention to perceive changes in scenes. *Psychological Science, 8*, 368–373.

Rock, I., & Kaufman, L. (1962). The moon illusion, II: The moon's apparent size is a function of the presence or absence of terrain. *Science, 136*, 1023–1031.

Rosenzweig, M. R., Leiman, A. L., & Breedlove, S. M. (1998). *Psychobiologie*. New York: Random House.

Ross, H., & Plug, C. (2002). *The mystery of the moon illusion: Exploring size perception*. Oxford, England: Oxford University Press.

Sasaki, T. (1980). Sound restoration and temporal localization of noise in speech and music sounds. *Tohoku Psychologica Folia, 39*, 79–88.

Schiffman, H. R. (2001). *Sensation and perception: An integrated approach* (5th ed.). New York: Wiley.

Sekuler, R., & Blake, R. (1990). *Perception* (2nd ed.). Toronto, Ontario, Canada: McGraw-Hill.

Selfridge, O. G. (1959). Pandemonium: A paradigm of learning. In D. V. Blake & A. M. Uttley (Eds.), *The mechanization of thought processes* (pp. 523–526). London: HM Stationery Office.

Shen, Y. (2013). Comparing adaptive procedures for estimating the psychometric function for an auditory gap detection task. *Attention, Perception and Psychophysics, 75*, 771–780.

Shen, Y., & Richards, V. M. (2012). A maximum-likelihood procedure for estimating psychometric functions: Thresholds, slopes, and lapses of attention. *Journal of Acoustical Society of America, 132*, 957–967.

Shepard, R. N. (1964). Circularity in judgments of relative pitch. *Journal of the Acoustical Society of America, 36*, 2346–2353.

Shepard, R. N. (1990). *Mind sight*. New York: Freeman.

Simons, D. J., & Chabris, C. F. (1999). Gorillas in our midst: Sustained inattentional blindness for dynamic events. *Perception, 28*, 1059–1074.

Snyder, J. S., & Alain, C. (2007). Toward a neurophysiology theory of auditory stream segregation. *Psychological Bulletin, 133*, 780–799.

Sperling, G. (1960). The information available in brief visual presentations. *Psychological Monographs, 74*, 1–29.

Stevens, S. S. (1961). The psychophysics of sensory functions. In A. W. Rosenblith (Ed.), *Sensory communication* (pp. 1–33). Cambridge, MA: MIT Press.

Stevens, S. S. (1975). *Psychophysics: Introduction to its perceptual, neural and social prospects*. New York: Wiley.

Strayer, D. L., & Johnston, W. A. (2001). Driven to distraction: Dual-task studies of simulated driving and conversing on a cellular phone. *Psychological Science, 12*, 462–466.

Stroop, J. R. (1935). Studies of interference in serial verbal reactions. *Journal of Experimental Psychology, 18*, 643–662.

Thompson, W. F., Russo, R. A., & Livingstone, S. (2010). Facial expressions of pitch structure in music performance. *Psychonomic Bulletin & Review, 17*, 317–322.

Treisman, A. M. (1960). Contextual cues in selective listening. *Quarterly Journal of Experimental Psychology, 12*, 242–248.

Treisman, A. M. (1996). The binding problem. *Current Opinion in Neurobiology, 6*, 171–178.

Treisman, A. M., & Gelade, G. (1980). A feature-integration theory of attention. *Cognitive Psychology, 12*, 97–136.

Treisman, A. M., & Schmidt, H. (1982). Illusory conjunctions in the perception of objects. *Cognitive Psychology, 14*, 107–141.

Tsao, D. Y., & Livingstone, M. S. (2008). Mechanisms of face perception. *Annual Review of Neuroscience, 31*, 411–437.

Tsunada, J., Lee, J. H., & Cohen, Y. E. (2011). Representation of speech categories in the primate auditory cortex. *Journal of Neurophysiology, 105*, 2634–2646.

van Noorden, L. P. A. S. (1975). *Temporal coherence in the perception of tone sequences*. Unpublished doctoral dissertation. Eindhoven University of Technology, Eindhoven, Netherlands.

Warren, R. M. (1970). Perceptual restoration of missing speech sounds. *Science, 167*, 392–393.

Weiskrantz, L. (1986). *Blindsight: A case study and implications*. Oxford, England: Oxford University Press.

Werner, H. (1935). Studies on contour: I. Quantitative analysis. *American Journal of Psychology, 47*, 40–64.

Wever, E. G., & Bray, C. W. (1937). The perception of low tones and the resonance-volley theory. *Journal of Psychology, 3*, 101–114.

Wightman, F. L., & Kistler, D. J. (1992). The dominant role of low-frequency interaural time differences in sound localization. *Journal of the Acoustical Society of America, 91*, 648–1661.

Wolfe, J. M., & Horowitz, T. S. (2004). What attributes guide the deployment of visual attention and how do they do it? *Nature Reviews Neuroscience, 5*, 1–7.

Wolfe, J. M., Kluender, K. R., Levi, D. M., Bartoshuk, L. M., Herz, R. S., Klatzky, R. L., et al. (2006). *Sensation and perception*. Sunderland, MA: Sinauer.

Yost, W. A. (2009). Pitch perception. *Attention, Perception and Psychophysics, 71*, 1701–1716.

Index

S. Grondin, *Psychology of Perception*, DOI 10.1007/978-3-319-31791-5