

**Psychophysiology**  
Psychology 124/236  
Winter Quarter, 2001  
Thursdays 1:15-3:45

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This seminar provides an overview of psychophysiology, the rigorous empirical study of mind-body relations. Topics include: principles of data acquisition and reduction, core psychophysiological concepts, the cardiovascular system, the electrodermal system, lie detection, emotion research, and health. Integrated laboratory sessions will provide hands-on experience.

Nuts and bolts

Class meetings have a discussion format. Laboratory sessions complement ongoing reading and class discussion by providing hands-on experience with psychophysiological measurement on topics such as lie detection. Class participation counts for 20% of the final grade. The in-class final counts for 80% of the final grade.

A course reader is required. It is available from the Stanford Bookstore, and is also on reserve at the library.

**Psychophysiology**  
Winter Quarter, 2001

***Week 1: Introduction to psychophysiology***

**Class: Thursday, January 11**

Cacioppo, J.T., & Tassinary, L.G. (Eds.). (1990). *Principles of psychophysiology: Physical, social, and inferential elements*. Cambridge, England: Cambridge University Press. PAGES 3-34 AND 193-215.

***Week 2: Anatomy, Physiology, and Response System Overview***

**Class: Thursday, January 18**

Vander, A.J., Sherman, J.H., & Luciano, D.S. (1990). *Human physiology* (5th ed.). New York: McGraw-Hill. PAGES 1-7.

Boddy, J. (1983). The nervous system: Structure and fundamental processes. In A. Gale & J.A. Edwards (Eds.), *Physiological correlates of human behaviour* (Vol. 1) (pp. 21-47). London: Academic Press.

Boddy, J. (1983). Information processing and functional systems in the brain. In A. Gale & J.A. Edwards (Eds.), *Physiological correlates of human behaviour* (Vol. 1) (pp. 49-77). London: Academic Press.

Vander, A.J., Sherman, J.H., & Luciano, D.S. (1990). *Human physiology* (5th ed.). New York: McGraw-Hill. PAGES 167-186.

**Laboratory**

Films, demonstration, and anatomy tutorial.

***Week 3: Data Acquisition and Data Reduction***

**Class: Thursday, January 25**

Cacioppo, J.T., & Tassinary, L.G. (Eds.). (1990). *Principles of psychophysiology: Physical, social, and inferential elements*. Cambridge, England: Cambridge University Press. PAGES 113-148.

**Laboratory**

PC-based data acquisition.

## ***Week 4: The cardiovascular system***

**Class: TUESDAY, February 6<sup>th</sup> !! NOTE SPECIAL MEETING TIME !!**

Vander, A.J., Sherman, J.H., & Luciano, D.S. (1990). *Human physiology* (5th ed.). New York: McGraw-Hill. PAGES 357-426.

Cacioppo, J.T., & Tassinari, L.G. (Eds.). (1990). *Principles of psychophysiology: Physical, social, and inferential elements*. Cambridge, England: Cambridge University Press. PAGES 456-512.

Manuck, S.B., & Krantz, D.S. (1986). Psychophysiological reactivity in coronary heart disease and essential hypertension. In K.A. Matthews, S.M. Weiss, T. Detre, T.M. Dembroski, B. Falkner, S.B. Manuck, & R.B. Williams, Jr. (Eds.). *Handbook of stress, reactivity, and cardiovascular disease* (pp. 11-34). New York: John Wiley & Sons

### **Laboratory**

Data acquisition and the measurement of heart rate.

## ***Week 5: The central nervous system***

**Class: Thursday, February 8 (Guest lecture by Dr. Judith Ford)**

Coles, M.G.H., & Rugg, M.D. (1995). Event-related brain potentials: An introduction. In M.D. Rugg & M.G.H. Coles (Eds.), *Electrophysiology of mind: Event-related brain potentials and cognition*. New York: Oxford University Press.

Farwell, L.A., & Donchin, E. (1991). The truth will out: Interrogative polygraphy ("Lie detection") with event-related brain potentials. *Psychophysiology*, 28, 531-547.

Sarter, M., Berntson, G.G., & Cacioppo, J.T. (1996). Brain imaging and cognitive neuroscience: Toward strong inference in attributing function to structure. *American Psychologist*, 51, 13-21.

### **Laboratory**

Visit to the Palo Alto VA.

## ***Week 6: The electrodermal system and arousal***

**Class: Thursday, February 15**

Cacioppo, J.T., & Tassinari, L.G. (Eds.). (1990). *Principles of psychophysiology: Physical, social, and inferential elements*. Cambridge, England: Cambridge University Press. PAGES 295-324.

Lacey, J.I. (1967). Somatic response patterning and stress: Some revisions of activation theory. In M.H. Appley & R. Trumbull (Eds.), *Psychological stress: Issues in research* (pp. 14-42). New York: Appleton-Century-Crofts.

Obrist, P.A., Webb, R.A., Sutterer, J.R., & Howard, J.L. (1970). The cardiac-somatic relationship: Some reformulations. *Psychophysiology*, 6, 569-587.

Fowles, D.C. (1980). The three arousal model: Implications of Gray's two-factor learning theory for heart rate, electrodermal activity, and psychopathy. *Psychophysiology*, 17, 87-104.

### **Laboratory**

Response fractionation and varieties of arousal.

## ***Week 7: Applications -- lie detection***

**Class: Thursday, February 22**

Saxe, L., Dougherty, D., & Cross, T. (1985). The validity of polygraph testing. *American Psychologist*, 40, 355-366.

Furedy, J.J. (1986). Lie detection as psychophysiological differentiation: Some fine lines. In M.G.H. Coles, E. Donchin, & S.W. Porges (Eds.), *Psychophysiology: Systems, processes, and applications*. (pp. 683-701). New York: Guilford.

Andreassi, J.L., Barry, R.J., Bashore, T.R., Ben-Shakhar, G., Boucsein, W., Carlton, B., Donchin, E., Farwell, L.A., Furedy, J.J., Ginsberg, S., Heslegrave, R.J., Miller, J.C., & Saxe, L. (1994). Potential conflicts between the "Control" Question "Test" (CQT) polygraph and SPR's Draft Ethics Code. Letter to the members of the Society for Psychophysiological Research.

### **Laboratory**

Lie detection.

## ***Week 8: Applications -- emotion research***

### **Class: Thursday, March 1**

James, W. (1884). What is an emotion? *Mind*, 9, 188-205.

Cannon, W. B. (1927). The James-Lange theory of emotions: A critical examination and an alternative theory. *American Journal of Psychology*, 39, 106-124.

Levenson, R. W. (1988). Emotion and the autonomic nervous system: A prospectus for research on autonomic specificity. In H. Wagner (Ed.), *Social psychophysiology: Perspectives on theory and clinical applications* (pp. 17-42). London: Wiley.

### **Laboratory**

Eliciting emotion in the laboratory.

## ***Week 9: Applications – psychological and physical health***

### **Class: Thursday, March 8 (Guest lecture by Dr. Pat Cowings)**

Maier, S.F., Watkins, L.R., & Fleshner, M. (1994). Psychoneuroimmunology: The interface between behavior, brain, and immunity. *American Psychologist*, 49, 1004-1017.

Cacioppo, J.T. (1994). Social neuroscience: Autonomic, neuroendocrine, and immune responses to stress. *Psychophysiology*, 31, 113-128.

### **Laboratory**

Visit to NASA Ames Research Center.

## ***Week 10: Review and reprise***

### **Class: Thursday, March 15**

Lang, P. J. (1995). The emotion probe. *American Psychologist*, 5, 372-385.

Bechara, A., Damasio, H., Tranel, D., Damasio, A.R. (1997). Deciding advantageously before knowing the advantageous strategy. *Science*, 275, 1293-1295.

### **Laboratory**

General review and Q/A period.