# Chapter 6 Behavior

# Overview

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**References**

1.[Selye H. The general adaptation syndrome and the diseases of adaptation.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink1rf0010) *[Am J Med](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink1rf0010)*[. 1951;10(5):549–555.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink1rf0010)

2.[Lazarus RS. From psychological stress to the emotions: a history of changing outlooks.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink2rf0015) *[Annu Rev Psychol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink2rf0015)*[. 1993;44:1–21.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink2rf0015)

3.[Mason JW. A historical view of the stress field.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink3rf0020) *[J Hum Stress](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink3rf0020)*[. 1975;1(1):6–12. Contd.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink3rf0020)

4.[Mason JW. A historical view of the stress field.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink4rf0025) *[J Hum Stress](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink4rf0025)*[. 1975;1(2):22–36.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink4rf0025)

5.[Folkman S, Lazarus RS. The relationship between coping and emotion: implications for theory and research.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink5rf0030) *[Soc Sci Med](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink5rf0030)*[. 1988;26(3):309–317.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink5rf0030)

6.[Grandjean D, Scherer KR. Unpacking the cognitive architecture of emotion processes.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink6rf0035) *[Emotion](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink6rf0035)*[. 2008;8(3):341–351.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink6rf0035)

7.[Sokolov EN. Higher nervous functions; the orienting reflex.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink7rf0040) *[Annu Rev Physiol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink7rf0040)*[. 1963;25:545–580.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink7rf0040)

8.[Lacey BC, Lacey JI. Two-way communication between the heart and the brain. Significance of time within the cardiac cycle.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink8rf0045) *[Am Psychol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink8rf0045)*[. 1978;33(2):99–113.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink8rf0045)

9.[Obrist P. The cardiovascular-behavioral interaction: as it appears today.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink9rf0050) *[Psychophysiology](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink9rf0050)*[. 1976;13:95–107.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink9rf0050)

10.[Hennessy JW, King MG, McClure TA, Levine S. Uncertainty, as defined by the contingency between environmental events, and the adrenocortical response of the rat to electric shock. *J Comp Physiol Psychol*. 1977;91(6):1447–1460.](file:///D:\womat-filecopy\Ed-Reference\0002570114.html#rfLink10rf0055)

11.[LeDoux JE. Emotion circuits in the brain.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink11rf0060) *[Annu Rev Neurosci](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink11rf0060)*[. 2000;23:155–184.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink11rf0060)

12.[Mineka S, Hendersen RW. Controllability and predictability in acquired motivation.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink12rf0065) *[Annu Rev Psychol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink12rf0065)*[. 1985;36:495–529.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink12rf0065)

13.[Lazarus R, Folkman S.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink13rf0070) *[Stress, Appraisal, and Coping.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink13rf0070)* [New York: Springer; 1984.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink13rf0070)

14.[Drugan RC, Basile AS, Ha JH, Healy D, Ferland RJ. Analysis of the importance of controllable versus uncontrollable stress on subsequent behavioral and physiological functioning.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink14rf0075) *[Brain Res Protoc](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink14rf0075)*[. 1997;2(1):69–74.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink14rf0075)

15.[Seligman ME. Learned helplessness.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink15rf0080) *[Annu Rev Med](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink15rf0080)*[. 1972;23: 407–412.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink15rf0080)

16.[McFarland DJ. On the causal and functional significance of displacement activities.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink16rf0085) *[Z Tierpsychol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink16rf0085)*[. 1966;23 (2):217–235.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink16rf0085)

17.[Wallace M, Singer G. Schedule induced behavior: a review of its generality, determinants and pharmacological data.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink17rf0090) *[Pharmacol Biochem Behav](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink17rf0090)*[. 1976;5(4):483–490.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink17rf0090)

18.[Wetherington CL. Is adjunctive behavior a third class of behavior?](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink18rf0095) *[Neurosci Biobehav Rev](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink18rf0095)*[. 1982;6(3):329–350.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink18rf0095)

19.[Brett LP, Levine S. Schedule-induced polydipsia suppresses pituitary-adrenal activity in rats.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink19rf0100) *[J Comp Physiol Psychol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink19rf0100)*[. 1979;93(5):946–956.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink19rf0100)

20.[Blanchard RJ, Blanchard DC. Bringing natural behaviors into the laboratory: a tribute to Paul MacLean.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink20rf0105) *[Physiol Behav](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink20rf0105)*[. 2003;79(3):515–524.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink20rf0105)

21.[DeVries AC, Glasper ER, Detillion CE. Social modulation of stress responses.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink21rf0110) *[Physiol Behav](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink21rf0110)*[. 2003;79(3):399–407.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink21rf0110)

22.[Thoits PA. Mechanisms linking social ties and support to physical and mental health.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink22rf0115) *[J Health Soc Behav](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink22rf0115)*[. 2011;52 (2):145–161.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink22rf0115)

23.[Piazza PV, Deminiere JM, Le Moal M, Simon H. Factors that predict individual vulnerability to amphetamine self- administration. *Science*. 1989;245(4925):1511–1513.](file:///D:\womat-filecopy\Ed-Reference\0002570114.html#rfLink23rf0120)

24.[Armario A, Nadal R. Individual differences and the characterization of animal models of psychopathology: a strong challenge and a good opportunity.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink24rf0125) *[Front Pharmacol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink24rf0125)*[. 2013;4:137.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink24rf0125)

25.[Crofton EJ, Zhang Y, Green TA. Inoculation stress hypothesis of environmental enrichment.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink25rf0130) *[Neurosci Biobehav Rev](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink25rf0130)*[. 2015;49C:19–31.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink25rf0130)

26.[McEwen BS, Morrison JH. The brain on stress: vulnerability and plasticity of the prefrontal cortex over the life course.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink26rf0135) *[Neuron](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink26rf0135)*[. 2013;79(1):16–29.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink26rf0135)

27.[Daskalakis NP, Bagot RC, Parker KJ, Vinkers CH, de Kloet ER. The three-hit concept of vulnerability and resilience: toward understanding adaptation to early-life adversity outcome. *Psychoneuroendocrinology*. 2013;38(9):1858–1873.](file:///D:\womat-filecopy\Ed-Reference\0002570114.html#rfLink27rf0140)

28.[Henry JP. Biological basis of the stress response.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink28rf0145) *[Integr Physiol Behav Sci](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink28rf0145)*[. 1992;27(1):66–83.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink28rf0145)

29.[Porges SW. The polyvagal theory: phylogenetic substrates of a social nervous system.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink29rf0150) *[Int J Psychophysiol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink29rf0150)*[. 2001;42 (2):123–146.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink29rf0150)

30.[Friedman M, Rosenman RH. Overt behavior pattern in coronary disease. Detection of overt behavior pattern A in patients with coronary disease by a new psychophysiological procedure.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink30rf0155) *[JAMA](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink30rf0155)*[. 1960;173:1320–1325.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink30rf0155)

31.[Edwards JR, Baglioni Jr AJ, Cooper CL. Examining the relationships among self-report measures of the Type A behavior pattern: the effects of dimensionality, measurement error, and differences in underlying constructs.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink31rf0160) *[J Appl Psychol](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink31rf0160)*[. 1990;75(4):440–454.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink31rf0160)

32.[Petticrew MP, Lee K, McKee M. Type A behavior pattern and coronary heart disease: Philip Morris's “crown jewel”.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink32rf0165) *[Am J Public Health](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink32rf0165)*[. 2012;102(11):2018–2025.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink32rf0165)

33.[Zuckerman M, Kuhlman DM. Personality and risk-taking: common biosocial factors.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink33rf0170) *[J Pers](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink33rf0170)*[. 2000;68(6):999–1029.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink33rf0170)

34.[Pabst S, Schoofs D, Pawlikowski M, Brand M, Wolf OT. Paradoxical effects of stress and an executive task on decisions under risk.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink34rf0175) *[Behav Neurosci](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink34rf0175)*[. 2013;127(3):369–379.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink34rf0175)

35.[Buckert M, Schwieren C, Kudielka BM, Fiebach CJ. Acute stress affects risk taking but not ambiguity aversion.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink35rf0180) *[Front Neurosci](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink35rf0180)*[. 2014;8:82.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink35rf0180)

36.[Radenbach C, Reiter AM, Engert V, et al. The interaction of acute and chronic stress impairs model-based behavioral control.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink36rf0185) *[Psychoneuroendocrinology](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink36rf0185)*[. 2015;53:268–280.](file:///D:\\womat-filecopy\\Ed-Reference\\0002570114.html" \l "rfLink36rf0185)