

# Preface

A few years ago (a time at which the words face and book were still independent from one another), we were ruminating on a set of experiments demonstrating that being a rat and being reared to a careful mother—a good rat mum spends hours feeding and licking her pups—increased the odds that a subsequent challenge or stressor would be handled without major hassles (i.e., with a small activation of all those biological systems mediating the increased heartbeat, vigilance, motor agitation, and sense of fear, common to all “stressed” mammals). “Lucky rat,” did one of us inadvertently whisper. Why lucky? What is stress good for? What is stress bad for? Is being less sensitive to external stressors necessarily good? By the same token, is being particularly sensitive to external stressors a sign of poor welfare? What is the link between stress and pathology? Where does stress sensitivity root? In other words, what are the genetic and environmental determinants of individual reactivity to external stressors? If developmental contexts played a predominant role, would perinatal and teenage adversities inevitably relate to disease states?

All these questions became a refrain pervading our meals, coffee breaks, and structured meetings. Besides, under the persuasion that broad questions like these require a multidisciplinary approach, we’ve come across the work of eminent scientists that had analogous questions in mind, that proposed innovative approaches, and that provided original answers.

After a few years, exceptional scientific progress has been made and an intermediate digest, providing partial answers to the previous questions, can be proposed. We envisioned such a digest to combine the unique views of the aforementioned eminent scientists about the link between development and stress. We thus asked them whether they were willing to contribute such perspective into a book—likely to be of interest to scholars ranging from university students to established scientists—tackling the multifaceted nature of “stress” from different angles. The positive response we got from them resulted into *Adaptive and Maladaptive Aspects of Developmental Stress*. The book, featuring contributions from scientists working in different countries, is introduced by a general overview offered by Trevor Archer and Richard Kostrzewa

and then subdivided into three sections aimed at providing introductory concepts about the stress response system and its adaptive role in evolutionary terms (Part I); experimental and clinical data about the maturation of the stress response system in reaction to contextual features and in association with functional adjustments or pathological derailments in our species (Part II); and experimental comparative data, obtained in animal species such as birds, rodents, and nonhuman primates, linking development (prenatal, early postnatal, adolescent), environmental conditions, stress, and adaptive/maladaptive outcomes (Part III).

In Part I, Chap. 2, Del Giudice, Ellis, and Shirtcliff set the general framework of the book introducing the stress response system and its development within a broad evolutionary-adaptive perspective; Maestripieri and Klimczuk (Chap. 3) then tighten the link between humans and other animal species by highlighting the similarities between the fundamental mechanisms behind the developmental regulation of the stress response system in different mammals. In Part II, Chap. 4, DiCorcia, Sravish, and Tronick describe a heuristic approach explaining the development of stress resilience (the ability to cope with repeated minor stressors) through the everyday confrontation with stressful events experienced by children; using an anthropological approach, Flinn, Ponzi, Nepomnaschy, and Noone then describe the evolutionary-adaptive underpinnings of the developmental plasticity of the stress response system, both from a theoretical and from an empirical (data-based) perspective (Chap. 5); subsequently, Nater and Skoluda elaborate on the consequences of developmental stressors (prenatal phase in Chap. 6 and childhood and adolescence in Chap. 7) in humans within the context of adaptive plasticity and pathology; their analyses rest on an applied approach, bridging individual maturation and environmental variables in the formation of the adult phenotype. In Part III, Chap. 8, Morley-Fletcher, Mairesse, and Maccari set the transition from clinical to preclinical data and describe the long-term influences of prenatal stress (in the form of psychophysiological stressors applied to rat mothers during gestation) on behavioral and neuroendocrine regulations in rats; building on this, Hauser describes the influences that an altered prenatal maturation of the stress response system (achieved through pharmacological interventions) may have on individual long-term cognitive and emotional adjustments in rats and primates (Chap. 9); the focus is shifted from prenatal to postnatal development by Cirulli and Berry who describe the fundamental mechanisms mediating the long-term consequences of early life stressors in rodents and their significance with respect to human health and disease (Chap. 10); Coutellier then elucidates the adaptive regulations shown by laboratory rodents in response to different forms of challenges encountered shortly after birth (Chap. 11); Macrì and Laviola subsequently describe the unique effects of stress during adolescence, summarizing literature showing that, compared to younger and older conspecifics, adolescent rodents show a differential short- and long-term stress reactivity (Chap. 12); finally, leveraging on data from avian research, Costantini offers a wide evolutionary-adaptive analysis of the effects of different stressors on embryonic maturation (Chap. 13).

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