Catatonia

This is a brilliant, up-to-date, and comprehensive review of the fast-growing field of catatonia, written by the two outstanding experts on the subject. This magisterial compendium covers every aspect of catatonia, ranging from the essential facets of history to the latest results in its neurobiological foundations. Remarkably, the book satisfies the needs of active researchers and practising mental health professionals equally well by providing detailed case histories to guide clinicians. A real tour de force that every clinician interested in neuropsychiatric movement disorders will find not only useful but fascinating.

Gabor S. Ungvari, MD, PhD, FRANZCP, FRCPsych, Clinical Professor of Psychiatry, University of Western Australia and Adjunct Professor, University of Notre Dame Australia

To this day, catatonia evokes awe in lay people and clinicians who know catatonia only as a mysterious total shutdown of behavior that can be dramatically undone by a sedative or induced seizures. Less well known are the complexity and gaps in knowledge that underscore the significance of catatonia for advancing understanding of brain–behavior relationships. Fortunately, Drs. Hirjak and Northoff, acknowledged experts in catatonia, bring together in this book a compilation of data on catatonia, the areas in need of further study, and a review of actionable strategies and technological innovations that could facilitate the way forward. Beyond the common view of catatonia as an occasional stupor, the authors cover the historical role of psychomotor symptoms in nosology, and the importance of catatonia in unraveling brain circuitry underlying behavioral disorders. Moreover, they provide a comprehensive review of the multiple forms of catatonia in people with childhood disorders and autism, in excited and agitated states, in medical and neurological disorders, in chronic mental disorders, and in the psychological aftermath of catatonic episodes. There is no doubt this will be a must-read resource for clinicians and neuroscientists inspired by and curious about people with catatonia.

Stanley N. Caroff, MD, Emeritus Professor in the Department of Psychiatry, Perelman School of Medicine at the University of Pennsylvania

Catatonia is one of the most enigmatic medical conditions of our time and lies at the intersection of neurology and psychiatry. The authors of this book have an international reputation in the field and are uniquely placed to unravel the mysteries of this condition. Their approach combines a thorough understanding of the scientific literature with a practical, clinical guide. I would recommend this book to a wide audience, ranging from neuroscientists to healthcare professionals.

Jonathan Rogers, PhD, Clinical Lecturer and Specialty Registrar in Neuropsychiatry, Division of Psychiatry, University College London

Catatonia

A Practical Guide to a Clinical and Scientific Conundrum

Dusan Hirjak
Central Institute of Mental Health, Mannheim

Georg Northoff
University of Ottawa

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Foreword

Gregory Fricchione

It is a real pleasure for me to write this foreword for this new book on the catatonic syndrome – a syndrome I have had an intimate relation with for over four decades. One might say I am a catatonia old-timer and have felt it has been too long since we have had a new book on the disorder given the major advances since the books in 2003 and 2004 of the wonderful Fink and Taylor, with which I was involved.

One of my early skirmishes with the condition dates to my days as a consultation psychiatry fellow at Massachusetts General Hospital in 1982. On a fateful day in the late summer of that year, I was paged to see a 43-year-old VIP South American man in the postoperative cardiovascular surgery unit. This patient was status-post aortic valve and mitral valve replacements. Unfortunately, he developed a post cardiotomy delirium complicated by very severe psychotic agitation and the cardiovascular surgeons had paged me stat to control the patient who was trying to pull out his endotracheal tube and other lines. I gave the patient intramuscular haloperidol right away – a neuroleptic antipsychotic medication often used for delirious agitation – and to continue his sedation, I also ordered standing doses of intravenous haloperidol. This medication is known to occasionally precipitate a neuroleptic-induced catatonia, and sure enough my patient developed a severe catatonic stupor the next day. After a few unsuccessful trials of antiparkinsonian medications, I reached out to my brilliant mentor and supervisor, the late Dr. Ned Cassem, for advice. He accompanied me to see the patient in the evening. It was Dr. Cassem who decided to give the patient a dose of the benzodiazepine lorazepam. He told me later he had been looking for diazepam to see if a muscle relaxant would be helpful. We administered 2 mg of the lorazepam intravenously and lo and behold the patient after just 5 minutes or so began to speak and move again! Dr. Cassem, who was also a Jesuit priest, told the astonished nurses with a wry grin, that we had given the patient "holy water." As we left the room, he whispered to me that we would have to try the lorazepam treatment again. We continued this first patient on lorazepam for a few days and the patient was discharged after his delirium cleared.

We did proceed to treat three other catatonic patients, all of whom had medical conditions, and reported these successfully treated patients in a 1983 paper.[1] In that paper, we said we thought it would be reasonable to also try lorazepam for psychogenic catatonia associated with bipolar illness and schizophrenia. Several months later, this was done and the authors reported success with psychogenic catatonia patients. Over time, lorazepam earned a reputation as an outstanding first-line treatment for acute catatonia, and over the years, it has been used in this way all over the world, helping to save lives and ease the tremendous pain and morbidity associated with this disorder. And I have taken delight in saying my major contribution to this medical story of clinical innovation was in making my poor patient catatonic in the first place!

This wonderful book is long-awaited, appearing 20 years after the last work on the subject. Much has been learned over this time from our clinical experience and research. The psycho-neuro-medical disorder we call catatonia deserves this new review given the

[1] Fricchione, G. L., N. H. Cassem, D. Hooberman, and D. Hobson. Intravenous lorazepam in neuroleptic-induced catatonia. *J Clin Psychopharmacol*, 1983. 3(6): pp. 338–342.

significant morbidity and mortality associated with it. Another reason for an intensive review involves the usefulness of catatonia as a probe in our never-ending quest to better understand how the brain works. An important and fascinating disorder like catatonia deserves more attention in the medical world and in the public arena, and when leading experts like Georg Northoff and Dusan Hirjak take on the task of writing a book on the subject, it is a cause for celebration and an opportunity to learn a great deal about the condition.

A major reason for our eager anticipation is the fact that the authors of this book are eminent neuroscientist researchers and noted clinical psychiatrists with years of experience caring for patients suffering with catatonia. These thought leaders are therefore equipped to give us the most up-to-date scientific understanding as well as an intimate look at how patients describe the fearful horrors of being in the throes of catatonia.

Georg Northoff, MD, PhD, is a philosopher, neuroscientist, and psychiatrist, holding degrees in all three disciplines. He is a professor of psychiatry at the University of Ottawa Department of Psychiatry and at The Royal Mental Health Care and Research Center. Dr. Northoff researches the relationship between the brain and mind in its various facets, focusing on the neural and biochemical mechanisms related to higher-order mental functions like consciousness and self in both healthy people and in those with such mental illnesses as depression and schizophrenia. Dr. Northoff is one of the leading figures in linking philosophy and neuroscience and is the author of over 260 journal articles (50 pertaining to catatonia) and 15 books, including *Neuro-philosophy and the Healthy Mind* (2016, Norton Publishing, New York). Dr. Northoff is also a world-class expert in neuroimaging, and this knowledge has helped inform his work on catatonia and its origins.

From his first papers on catatonia, it was clear that Dr. Northoff's curious and innovative mind would help us make inroads into understanding the condition and by extension improve our understanding of the brain and its functioning. I was struck by his approach to initially nail down the motor aspects of catatonia and then to add the psychological dimension to it. It is no exaggeration to say that Dr. Northoff has contributed most to our understanding of brain structure and function in catatonia through his use of structural and functional magnetic resonance imaging. He is probably the leading authority on the neuroimaging of catatonia, and this work has much to contribute to our basic understanding of how motivation turns into movement in the human brain.

Dr. Northoff has also been most responsible for emphasizing the fact that catatonia is a quintessential psychomotor condition. In addition, his Northoff Catatonia Rating Scale has had an impact on our understanding of the role affective change plays in the disorder. I have a vivid memory of an extraordinary paper he published in the journal *Behavioral Brain Science* back in 2002. In it he accepted the challenge of analyzing and synthesizing what was known at the time of the pathophysiology of catatonia. This led to his strong argument in that paper that the top-down dimension in catatonia was of marked importance, signifying that the disorder was indeed a psychomotor one. Since that time, Dr. Northoff has often collaborated with this book's coauthor, Dusan Hirjak, in providing further evidence for this view, much of which has found its way into this book.

Dusan Hirjak, MD, is Associate Professor and Managing Assistant Medical Director in the Department of Psychiatry and Psychotherapy at the Central Institute of Mental Health in Mannheim, Germany. Dr. Hirjak has published over 200 papers, 44 on catatonia alone. Many of these articles have focused on imaging but he also has contributed his hypotheses, often in collaboration with Dr. Northoff, concerning the pathophysiological underpinnings

of the condition, while also advancing up-to-date guidelines on diagnosis and treatment. Dr. Hirjak has also contributed to our appreciation of the history of catatonia studies.

These two experts in catatonia have given us a new book that does not disappoint. In its early chapters, we are acquainted with the history of this fascinating and clinically important syndrome and the challenges it presents to our efforts to classify it using present-day nosology and diagnostic categories. There are strict constructionist and loose constructionist opinions about catatonia criteria, and this controversial area is covered in this book. Perhaps most importantly, the book presents case material that grounds the work in the day-to-day experience of patients and the clinicians who care for them. This then sets the stage for a discussion of the intersubjective phenomena we see and recognize, and for a window into a patient-centered view of what it must be like to be trapped in a catatonic state. A survey of the epidemiological data is next, emphasizing how modern psychiatry comes to terms with the wide array of neuromedical and psychiatric conditions that can all follow a final common pathway into catatonia replete with a panoply of clinical psychomotor signs and symptoms. Unless these signs and symptoms are expeditiously diagnosed and treated, catatonia can precipitate significant medical morbidity and even mortality. Diagnostic screening instruments such as the Bush-Francis Catatonia Rating Scale and the Northoff Catatonia Rating Scale can be useful tools in facilitating diagnosis and measuring treatment progress. The latter topic of management and treatment is reviewed in depth with impact on course and outcome emphasized. The underlying pathophysiology of the condition is then examined with special emphasis on neuroinflammatory and neural network models, and with the requisite modesty, given the extraordinary mystery that this complex disorder still presents.

The authors end with an important chapter that argues for catatonia to be recognized as a dangerous but fortunately treatable natural experiment of sorts, which is trying to teach us about how the brain moves from motivation to movement. It is of interest that the word *emotion* is from the Latin word *emovere*, which means to "move out." It encapsulates the psychomotor nature of catatonia and how it disables decision-making. Embedded in the decisive action toward movement, lacking or disorganized in the patient with catatonia, we may find clues as to how we can aid all our patients to make healthier decisions. That would indeed be an outstanding byproduct of the kind catatonia research the authors of this book advocate!

Gregory Fricchione, MD
Clinician Investigator, Full Professor of Psychiatry, Mass General Research Institute; Psychiatrist, Psychiatry, Massachusetts General Hospital; Herbert Benson Professor of Psychiatry, Harvard Medical School; Director of Benson-Henry Institute for Mind Body Medicine, Massachusetts General Hospital

Foreword

Andreas Meyer-Lindenberg

Catatonia is clearly having a moment. A concept with a storied history in psychiatry, it is once again attracting the attention it deserves from clinicians and basic scientists alike. Significant strides have been made in understanding this surprisingly common condition. Recent advancements, such as in structural and functional imaging, have deepened our understanding of catatonia's pathophysiology and point the way to new treatment and prevention approaches.

This book bears testimony to this profound progress. Written by two highly esteemed experts with a decades-long focus on catatonia, Dusan Hirjak and Georg Northoff, it illuminates the field from all angles. One-hundred-and-fifty-one years after its original description, catatonia has reemerged as a psychomotor disorder *sui generis*, reclaiming the center stage in clinical and scientific discourse. Both authors have been at the forefront of advancing this psychomotor perspective, an understanding now formally recognized and incorporated into the *International Classification of Diseases 11th Revision* (World Health Organization; ICD-11). Through their research, they have not only contributed to reignited interest in this classic syndrome but also fundamentally shaped its contemporary interpretation and classification. Drawing from their complementary expertise, this book offers a comprehensive and nuanced examination of catatonia, providing an invaluable resource for clinicians, researchers, and anyone seeking a deeper understanding of this enigmatic condition.

What sets this book apart is its multidisciplinary and pluralistic approach. It seamlessly integrates a modern neurobiological perspective with clinical realities, complemented by the subjective experiences of catatonia patients and an outlook on what still needs to be done to help as many patients as possible. This unique combination bridges the gap between scientific inquiry and practical application, offering readers an unparalleled understanding of catatonia from multiple vantage points. Particularly captivating are the detailed patient cases in Chapter 3, which vividly illustrate the real-world challenges and complexities involved in diagnosing and treating catatonia. These narratives put into sharp relief the human experiences and struggles that underpin the scientific data.

This book is not just a compendium of current knowledge and of the current research frontier; it is also a call to action. It aims to inspire clinicians to pay closer attention to catatonia, ensuring timely and accurate diagnoses, and it challenges researchers to explore this topic further, leveraging diverse perspectives and methodologies. By doing so, it lays the groundwork for improved therapies and outcomes, as well as a richer understanding of catatonia's place in the broader context of mental health. In this way, this book will not only serve as an invaluable resource for clinicians and scientists alike but will also contribute significantly to improving the care and treatment of patients with catatonia.

Andreas Meyer-Lindenberg, MD, PhD, MSc
Director and CEO of Central Institute of Mental Health

Preface

This year, 2025, is the 151th anniversary of the publication of Karl Kahlbaum's landmark book, *Catatonia or Tension Insanity*, which launched over a century of research to understand this fascinating disorder. It is therefore a great honor for us to review the current state of knowledge of catatonia and areas for future research in this book designed for clinicians and researchers. As clinicians and researchers, we are entrusted with the responsibility of understanding and addressing the complexity of mental illness, and catatonia presents us with unique challenges and opportunities for clinical and scientific/methodological development. However, catatonia is often considered an uncommon and esoteric condition that is shrouded in controversy, confusion, and uncertainties.

For clinicians, catatonia is a severe but complex disorder. There is both the problem of diagnostic classification and that of differentiating catatonic from noncatatonic conditions. Although catatonia is a relatively rare psychomotor disorder, it has considerable clinical relevance for both psychiatry and other medical disciplines because it can be associated with potentially life-threatening complications. Clinically, the question arises as to the nature of the disorder, whether it is primarily a neurological movement disorder or psychiatric disorder, as well as possible pathophysiological substrates in the cortical and subcortical regions. Furthermore, catatonia is instructive for the entire field of psychiatry because it encompasses numerous symptoms and functional domains. Catatonia is now included as an independent diagnostic entity (at the same hierarchical level as schizophrenia or mood disorders) in ICD-11. That presents a great opportunity to make clinicians more aware of catatonia as a possible psychiatric diagnosis to be considered. This long-overdue perspective is also an important step to perform more specific neurobiological and clinical studies on catatonia. Because catatonia is still relatively unfamiliar and often overlooked by clinicians, we are compelled to utilize this book as a platform to raise awareness of this complex and frequently misunderstood condition. By shedding light on the historical developments, current diagnostic concepts and challenges, diverse clinical presentations, pathophysiological mechanisms, and treatment options associated with catatonia, we aim to empower clinicians and the broader medical community with the knowledge and tools necessary to recognize and effectively manage this debilitating syndrome. Through comprehensive exploration and dissemination of evidence-based practices, we aspire to challenge prevailing misconceptions and bridge existing gaps in understanding, ultimately advocating for enhanced screening, early intervention, and compassionate care for individuals grappling with catatonia.

For scientists, catatonia lends itself to investigation from a myriad of perspectives, encompassing historical, phenomenological, neurobiological, neurochemical, neuropsychological, and social psychiatric dimensions. Through a historical lens, understanding the evolution of diagnostic criteria and conceptualizations provides crucial context for contemporary assessment practices. Phenomenologically, the diverse array of clinical manifestations, ranging from motor abnormalities to alterations in affect and cognition, offers valuable insights into the subjective experiences of individuals with catatonia. In recent years, numerous studies have focused on the subjective experience of catatonic patients. It follows that developing therapeutic approaches for the post-acute phase is crucial, and as

a result, several indications suggest that psychotherapy will play an important role in the post-acute care of catatonia. Neurobiological and neurochemical perspectives delve into the underlying neural circuitry and neurotransmitter dysregulation implicated in catatonic symptoms, hopefully informing both future diagnostic approaches and targeted interventions. Neuropsychological assessment elucidates cognitive functioning and executive control deficits associated with catatonia, guiding comprehensive treatment planning. Lastly, considering social psychiatric factors such as interpersonal relationships, cultural influences, and environmental stressors is essential for a holistic understanding of the patient's condition and optimizing long-term outcomes. Integrating these diverse perspectives fosters a comprehensive assessment framework that is essential for effective management and care of individuals with catatonia.

On a more general level, catatonia raises the question of the links between neurology and psychiatry, and between mind and brain. Especially in the last few years, a very creative and productive group of scientists has been established who have investigated catatonia with a wide variety of methods. This is, for instance, visible in the controversy about the psychomotor versus motor view of catatonia: Is catatonia primarily based on motor dysfunction as related to the subcortical-cortical motor pathways? Or, alternatively, is catatonia based more on psychological origins in extreme emotions and/or thoughts that then lead to motor and behavioral changes? These are not only scientific questions for the mechanisms of catatonia but they are also clinically relevant as the two alternatives entail different assessments using either the Bush-Francis Catatonia Rating Scale or the Northoff Catatonia Rating Scale. Our book will touch upon this and various other controversies surrounding the often mysterious clinical picture of catatonia.

Keeping the clinical and scientific need to better understand catatonia in mind, the main aim of this book is to present catatonia as a psychomotor syndrome encompassing affective, motor, and cognitive-behavioral abnormalities. This book should serve both clinicians and scientists as a foundation for further study of this exciting neuropsychiatric disorder. As we delve into its pages, may we approach our task with humility, curiosity, and an unwavering commitment to the well-being of those afflicted by this enigmatic disorder.

Last but not least, while significant strides have been made in understanding catatonia in the last 10–20 years, it's essential to acknowledge that the science surrounding this complex syndrome is by no means complete. As such, this book serves not as a definitive endpoint, but rather as a catalyst for continued exploration and innovation in both clinical practice and scientific inquiry. By illuminating the current state of knowledge and synthesizing diverse perspectives on catatonia, we hope to inspire readers to critically engage with existing paradigms and generate new ideas for approaching this condition both clinically and scientifically. Through ongoing collaboration, research endeavors, and interdisciplinary dialogue, we can collectively advance our understanding of catatonic symptoms, refine diagnostic and treatment approaches, and ultimately improve outcomes for individuals affected by catatonia.[1]

[1] In this book, we have used the terms catatonia symptoms and catatonia signs interchangeably, while acknowledging that some authors advocate for a strict distinction between the two. In clinical practice, the boundaries between symptoms – subjective experiences reported by patients – and signs – objective findings observed by clinicians – can often blur, particularly in neuropsychiatric conditions such as catatonia. To enhance clarity and readability throughout the text, we have chosen a unified usage of the terms, without intending to dismiss the nuances of their traditional definitions.

Acknowledgments

We would like to extend our heartfelt thanks to those who supported us in our work and contributed to the creation of this book: We sincerely thank the members of our working groups and colleagues who have supported and accompanied us on this journey, often spanning many years. Their dedication and collaboration have been invaluable to our efforts. We would like to extend our heartfelt gratitude to Geva Brandt, Sebastian Volkmer, Jonas Daub, Stefan Fritze, and Katharina Kubera for their invaluable contributions to this work. Their meticulous proofreading and insightful discussions of the chapters have greatly enriched the quality and clarity of this book. Their expertise and dedication were instrumental in shaping the final version of our work, and we are deeply appreciative of their time and effort. We extend our deepest gratitude to three distinguished experts in the field of catatonia – Gabor Ungvari, Stanley Caroff, and Jonathan Rogers – for their exceptional support. Their thorough review and discussion of the chapters and insightful advice greatly enhanced the quality and depth of this work. This book has greatly benefitted from their extensive clinical experience and longstanding contributions to research in the field. We are also deeply appreciative of Gregory Fricchione and Andreas Meyer-Lindenberg for their thoughtful prefaces, which we believe will significantly elevate the prominence of our book and further highlight the importance of advancing research and clinical understanding in the field of catatonia. We also thank the editors and staff of Cambridge University Press for their patience and guidance, with special gratitude to Anna Whiting, Robin Driscoll, Abigail Neale, and Dhanraj Subbiah for their exceptional assistance.

We extend our heartfelt gratitude to all our patients and their families, whose participation and insights made the studies we conducted over the past decades possible. Their experiences have taught us invaluable lessons about catatonia, inspiring us to delve deeper into understanding this intricate and, at times, enigmatic phenomenon of the human mind and brain.

Finally, we would also like to express our profound appreciation to our families for their unwavering support and understanding, allowing us the time and space to dedicate ourselves to writing this book.