

# The effects of sleep quality, sleepiness, fatigue, and psychological resilience on attention performance

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## Abstract

**Introduction:** The aim of the study was to examine the relationships between sleep quality, sleepiness, fatigue, resilience, and attention parameters in a sample consisting of university students.

**Material and methods:** The study involved 123 university students aged between 18 and 33 years. A socio-demographic data form, the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Fatigue Severity Scale (FSS), Depression, Anxiety, and Stress Scale (DASS-21), and the Brief Resilience Scale (BRS) were administered to the participants. Attention assessment was conducted using the Cognitron (COG), Signal Detection (SIGNAL), Inhibition (INHIB), and Perception and Attention Functions Battery, part of the computer-based Vienna Test System (VTS).

**Results:** Out of all the participants, 77.2% were female, and 22.8% were male, with an average age of 21.53 (SD = 2.54) years. A positive correlation was found between COG-Corrects and PSQI scores, and COG-Incorrects and DASS-Stress. There was a negative correlation between SIGNAL-Corrects and FSS. No correlation was revealed among sleep quality, sleepiness, fatigue, resilience variables, and reaction inhibition or divided attention. Furthermore, multiple regression analysis indicated that attention scores were predicted only by sleep quality and fatigue severity.

**Conclusions:** Based on the study's findings, it is conceivable that situational factors such as sleep quality, sleepiness, and fatigue have a more significant impact on attention compared with constant variables such as depression, anxiety, stress, and resilience.

**Key words:** Vienna Test System, attention, fatigue, sleepiness, resilience.

## Introduction

Attention is a primary and complex cognitive function that refers to the frontage and focus of mental resources on a stimulus. Simultaneously, it represents turning towards a stimulus while disregarding others (Posner *et al.* 2016). Attention is separated into four types: selective, sustained, executive, and divided. Selective attention refers to the capacity to focus on a particular stimulus while disregarding other distracting stimuli. Divided attention is the ability to deal with multiple stimuli simultaneously, and executive attention ensures that attention is maintained (Rueda *et al.* 2023). Sustained attention requires long-term focus on a stimulus and is regarded as a concept associated with alertness (Cohen 2013). According to contemporary theories, attention is a system that consists of

multiple brain networks with interrelated but distinct functions (Fisher 2019). Spikman and van Zomeren (2010) stated that attention has two general dimensions, selectivity and intensity; they also refer in their articles to the Vienna Test System (VTS), which is a computer-based application used in the assessment of sustained attention, focused/selective attention, and divided attention (Spikman and van Zomeren 2010).

Although attention is a parameter that multiple psychological factors can impact, there has been more focus on how specific psychological processes such as sleep, fatigue, and psychopathological processes (e.g., depression, anxiety) affect attention. Sleep has a restorative function in human life and is essential for physiologic and circadian rhythms. Quantitative and qualitative shifts in sleep influence multiple systems (Bryant

# Sleep Sleepiness And Performance

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## **Sleep Sleepiness And Performance:**

**Sleep, Sleepiness, and Performance** Timothy H. Monk,1991      *Sleep* Teofilo L. Lee-Chiong,2005-12-13 A unique resource on sleep medicine Written by contemporary experts from around the world Sleep A Comprehensive Handbook covers the entire field of sleep medicine Taking a novel approach the text features both syndrome and patient oriented coverage making it ideally suited for both clinical use and academic study Sleep A Comprehensive Handbook begins with a brief introduction to the basic science of sleep from neurobiology to physiologic processes This leads into sections offering comprehensive coverage of insomnia sleep apnea narcolepsy parasomnias movement disorders and much more Sleep and related disorders are also discussed followed by chapters on considerations for special patient groups Special materials for practitioners include a sample interview and questionnaire as well as a chapter on operating and managing a sleep center The text concludes with discussions of sleep assessment methods such as polysomnography actigraphy and video EEG monitoring With full coverage of over 100 key topics in sleep medicine Sleep A Comprehensive Handbook offers the most practical thorough yet handy resource available on adult and pediatric sleep medicine Praise from the reviews no other publication in the field can begin to compare with the breadth or depth of the Handbook I cannot imagine a functioning sleep disorders clinic without at least one copy on standby as a ready reference PscyCRITIQUES Sleep A Comprehensive Handbook is a first rate textbook with concise up to date information covering a wide range of subjects pertinent to the practice of sleep medicine DOODY S HEALTH SERVICES      *Kryger's Principles and Practice of Sleep Medicine - E-Book* Meir H. Kryger,Thomas Roth,Cathy A Goldstein,2021-12-16 Offering today s most authoritative comprehensive coverage of sleep disorders Kryger s Principles and Practice of Sleep Medicine 7th Edition is a must have resource for sleep medicine specialists fellows trainees and technicians as well as pulmonologists neurologists and other clinicians who see patients with sleep related issues It provides a solid understanding of underlying basic science as well as complete coverage of emerging advances in management and treatment for a widely diverse patient population Evidence based content hundreds of full color illustrations and a wealth of additional resources online help you make well informed clinical decisions and offer your patients the best possible care Contains new chapters on sleep in intersex and transgender individuals sleep telemedicine and remote PAP adherence monitoring and sleep and the menstrual cycle as well as increased coverage of treatment and management of pediatric patients Includes expanded sections on pharmacology sleep in individuals with other medical disorders and methodology Discusses updated treatments for sleep apnea and advancements in CPAP therapy Offers access to 95 video clips online including expert interviews and sleep study footage of various sleep disorders Meets the needs of practicing clinicians as well as those preparing for the sleep medicine fellowship examination or recertification exams with more than 950 self assessment questions answers and rationales online Enhanced eBook version included with purchase Your enhanced eBook allows you to access all of the text figures and references from the book on a variety of devices

**Sleepiness** Michael J. Thorpy, Michel Billiard, 2011-01-27 Written and edited by leading clinicians and researchers in sleep medicine this is the first book to focus on the causes consequences and treatment of disorders of excessive sleepiness Extensive coverage is provided for all known causes of sleepiness including sleep deprivation obstructive sleep apnea syndrome narcolepsy and other hypersomnias of central origin shift work and medical and psychiatric disorders Since many causes of sleepiness are difficult to differentiate from each other and treatment modalities can vary greatly from one disorder to another this book helps the clinician to formulate a differential diagnosis that will ultimately lead to the correct diagnosis Epidemiology evaluation of the sleepy patient diagnostic investigations including neuroimaging subjective and objective testing cognitive effects of sleepiness motor vehicle driving issues medico legal aspects of sleepiness and therapy are also discussed in detail This is an essential resource for neurologists psychiatrists and sleep specialists The Oxford Handbook of Sleep and Sleep Disorders Charles M. Morin, Colin A. Espie, 2012-03 A great deal of progress has been made in the characterization assessment and treatment of sleep disorders in recent years Detailing the functions of sleep and its effect on cognition and development this book offers a comprehensive practical approach to the evaluation and treatment of patients with sleep disorders **Principles and Practice of Sleep Medicine E-Book** Meir H. Kryger, Thomas Roth, William C. Dement, 2015-12-29 For nearly 30 years Dr Meir Kryger's must have guide to sleep medicine has been the gold standard in this fast changing field This essential full color reference includes more than 20 unique sections and over 170 chapters covering every aspect of sleep disorders giving you the authoritative guidance you need to offer your patients the best possible care Evidence based content helps you make the most well informed clinical decisions An ideal resource for preparing for the sleep medicine fellowship examination New content on sleep apnea neurological disorders legal aspects of sleep medicine dental sleep medicine genetics circadian disorders geriatrics women's health cardiovascular diseases and occupational sleep medicine keeps you fully up to date Updates to scientific discoveries and clinical approaches ensure that you remain current with new knowledge that is advancing the diagnosis and management of sleep disorders **Evaluation of U.S. Department of Transportation efforts in the 1990s to address operator fatigue**, 1999 During the 1980s the National Transportation Safety Board investigated several aviation highway and marine accidents that involved operator fatigue Following completion of these accident investigations the Safety Board in 1989 issued three recommendations to the U S Department of Transportation DOT addressing needed research education and revisions to hours of service regulations Ten years have passed since these safety recommendations were issued In the interim the Safety Board has issued more than 70 additional recommendations to the DOT States industry and industry associations to reduce the incidence of fatigue related accidents In response to the three 1989 recommendations the DOT and the modal administrations have in general acted and responded positively to the recommendations addressing research and education little action however has occurred with respect to revising the hours of service regulations Nevertheless the Safety Board believes that support has

grown in recent years to make substantive changes to these regulations This report provides an update on the activities and efforts by the DOT and the modal administrations to address operator fatigue and consequently the progress that has been made in the past 10 years to implement the actions called for in the three intermodal recommendations and other fatigue related recommendations The report also provides some background information on current hours of service regulations fatigue and the effects of fatigue on transportation safety As a result of this safety report the National Transportation Safety Board issued new safety recommendations to the U S Department of Transportation the Federal Aviation Administration the Federal Highway Administration the Federal Railroad Administration the Research and Special Programs Administration and the United States Coast Guard

**Understanding Doctors' Performance** Jim Cox,Jenny King,Allen Hutchinson,Pauline McAvoy,2023-02-24 Understanding Doctors Performance addresses possible reasons why doctors under perform covering specific areas such as education and training physical and mental health workload personality organisational culture drug and alcohol misuse and cognitive impairment It draws together evidence and describes the factors apart from clinical competence that adversely affect performance and how they can be prevented identified assessed and addressed This practical and easy to read book is invaluable for NHS managers medical directors chief executives and board members along with directors of human resources in healthcare and healthcare professionals interested in the assessment of performance or the management of underperformance

**Elements of Human Performance** Andries F. Sanders,Andries Sanders,2013-02-01 This book presents a review of research on reaction processes and attention as it has evolved over the last 40 years in the context of the information processing tradition in cognitive psychology It is argued and demonstrated that issues of reaction processes and attention are closely interconnected Their common conceptualization can be seen in terms of limited processing capacity on the one hand and stage analysis on the other This volume concludes that at present a stage analysis metaphor offers better prospects as a conceptual starting point the limited capacity metaphor was strongly tied to the digital computers of the 60s The emphasis of the book is on behavioral research but summaries of related findings on evoked potentials and other psychophysiological variables are included as well From this perspective it may be of interest to neuropsychologists who want to learn about the present state of cognitive experimental paradigms Elements of Human Performance also addresses the question of the relationship between basic research and applications in the said areas This is particularly urgent in view of the now common notion that the results of many simplified laboratory tasks may be artifactual and of little applied value A back to back research strategy is outlined to assess the validity of basic research results for real life tasks

**Aircraft Accident Report , Elements of Human Performance** Andries Frans Sanders,1998 The book focuses on 2 aspects of human performance theory reaction processes and attention These aspects are often ignored by treatments of cognitive psychology but are central to understanding an individual s performance

**The U.S. Department of Transportation's Proposed Hours of Service Regulations for Motor Carriers** United States. Congress. House.

Committee on Transportation and Infrastructure. Subcommittee on Ground Transportation, 2001      **Human Mental Workload: Models and Applications** Luca Longo, M. Chiara Leva, 2019-02-22 This book constitutes the refereed proceedings of the Second International Symposium on Human Mental Workload Models and Applications H WORKLOAD 2018 held in Amsterdam The Netherlands in September 2018 The 15 revised full papers presented together with one keynote were carefully reviewed and selected from 31 submissions The papers are organized in two topical sections on models and applications      **Neuroergonomics** Raja Parasuraman, Matthew Rizzo, 2008-02-13 Neuroergonomics can be defined as the study of brain and behavior at work It combines two disciplines neuroscience the study of brain function and human factors the study of how to match technology with the capabilities and limitations of people so they can work effectively and safely The goal of merging these two fields is to use the startling discoveries of human brain and physiological functioning both to inform the design of technologies in the workplace and home and to provide new training methods that enhance performance expand capabilities and optimize the fit between people and technology Research in the area of neuroergonomics has blossomed in recent years with the emergence of noninvasive techniques for monitoring human brain function that can be used to study various aspects of human behavior in relation to technology and work including mental workload visual attention working memory motor control human automation interaction and adaptive automation This volume will provide the first systematic overview of this emerging area describing the theoretical background basic research major methods as well as the new and future areas of application This collection will benefit a number of readers the experienced researcher investigating related questions in human factors and cognitive neuroscience the student wishing to get a rapid but systematic overview of the field and the designer interested in novel approaches and new ideas for application Researchers in human factors and ergonomics neuroscience cognitive psychology medicine industrial engineering and computer science will find this volume most helpful      **First, Do Less Harm** Ross Koppel, Suzanne Gordon, 2012-04-23 Each year hospital acquired infections prescribing and treatment errors lost documents and test reports communication failures and other problems have caused thousands of deaths in the United States added millions of days to patients hospital stays and cost Americans tens of billions of dollars Despite and sometimes because of new medical information technology and numerous well intentioned initiatives to address these problems threats to patient safety remain and in some areas are on the rise In First Do Less Harm twelve health care professionals and researchers plus two former patients look at patient safety from a variety of perspectives finding many of the proposed solutions to be inadequate or impractical Several contributors to this book attribute the failure to confront patient safety concerns to the influence of the market model on medicine and emphasize the need for hospital wide teamwork and greater involvement from frontline workers from janitors and aides to nurses and physicians in planning implementing and evaluating effective safety initiatives Several chapters in First Do Less Harm focus on the critical role of interprofessional and occupational practice in patient safety Rather than focusing on the usual suspects

physicians safety champions or high level management these chapters expand the list of stakeholders and patient safety advocates to include nurses patient care assistants and other staff as well as the health care unions that may represent them First Do Less Harm also highlights workplace issues that negatively affect safety including sleeplessness excessive workloads outsourcing of hospital cleaning and lack of teamwork between physicians and other health care staff In two chapters experts explain why the promise of health care information technology to fix safety problems remains unrealized with examples that are at once humorous and frightening A book that will be required reading for physicians nurses hospital administrators public health officers quality and risk managers healthcare educators economists and policymakers First Do Less Harm concludes with a list of twenty seven paradoxes and challenges facing everyone interested in making care safe for both patients and those who care for them

**Making Shiftwork Tolerable** Timothy H. Monk, Simon Folkard, 2024-11-01 This text guides the reader through the many forms of shiftwork adopting a broad definition as being any regularly taken employment outside the day working window 06 00 to 18 00 This excellent guide introduces the many and varied forms of shiftwork adopting from the outset a broad definition of the term to embrace any regularly taken employment outside the day working window The authors both internationally recognised experts in the field describe in jargon free language the diverse experiences of shift workers and identify the problems associated with abnormal hours As shiftwork becomes more prevalent prompted by economic considerations of employers in both traditional manufacturing and more recently in the service sector new shiftwork patterns are being introduced The authors acknowledge the problems inherent in studying shiftwork reviewing three classes of study field survey and laboratory simulation and discuss the role of national culture in determining and limiting the applicability of generic results Topics covered include human biological economic social and domestic influences stress strain and shiftwork health and safety shiftwork and task performance The Impacts of the Department of Transportation's Commercial Driver Hours-of-service Regulations United States. Congress. House. Committee on Transportation and Infrastructure. Subcommittee on Highways and Transit, 2013

Obstructive Sleep Apnea Clete A. Kushida, 2007-05-15 More than 18 million Americans have Obstructive Sleep Apnea OSA but more than 90% of cases still remain undiagnosed This source offers a thorough review of key considerations in the identification and treatment of OSA and discusses issues often unaddressed in other publications on the topic such as gender age drug interactions and associat

Crisis Management in Acute Care Settings Michael St. Pierre, Gesine Hofinger, Robert Simon, 2016-11-07 This book is unique in providing a comprehensive overview of the human factors issues relevant to patient safety during acute care By elucidating the principles of human behavior and decision making in critical situations and identifying frequent sources of human error it will help healthcare professionals provide safer more effective treatment when dealing with emergencies characterized by uncertainty high stakes time pressure and stress The third edition has emerged from an ongoing synergistic relationship between clinicians and behavioral scientists on both sides of the Atlantic to update and enhance each chapter

blending the strengths of the two professions into a readily accessible text Among other improvements readers will find sharper articulation of concepts and significantly more information on the organizational impact on individual and team performance Crisis Management in Acute Care Settings is the required reference for all who are learning about teaching or providing acute and emergency healthcare It will be of high value for undergraduate and graduate medical and nursing program and offer a much needed resource for those who use high fidelity healthcare simulation to teach teamwork

**The Handbook of Operator Fatigue** Gerald Matthews,P.A. Hancock,2017-11-01 Fatigue is a recognized problem in many facets of the human enterprise It is not confined to any one area of activity but enters all situations in which humans have to perform for extended intervals of time Most problematic are the circumstances in which obligatory action is continuous and the results of failure are evidently serious or even catastrophic Therefore the modern media especially highlights fatigue related failures in industries such as transportation materials processing and healthcare It can be and indeed is no coincidence that most of the spectacular failures in process control that have resulted in the world s largest industrial accidents have occurred in the small hours of the morning when the circadian rhythm is lowest and operator fatigue itself peaks While there have been legislative efforts made at state federal and international levels to regulate working hours of employees the appropriate implementation of such legislation is still a long way off The Handbook of Operator Fatigue provides a comprehensive account of the subject to serve as the definitive reference work for researchers students and practitioners alike The volume features 30 chapters written by experts from around the world to address each important facet of fatigue including the scale of the fatigue problem Section I the nature of fatigue Section II how to assess fatigue Section III the impact of fatigue on health Section IV fatigue in the workplace Section V the neurological basis of fatigue VI sleep disorders VII and the design of countermeasures to fatigue VIII



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