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Information-processing, affect, and psychopathology: A Festschrift for Michael W. Eysenck

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Introduction

The past few decades has witnessed an explosion of research into the impact of emotions (both negative and positive) on cognition, with a special emphasis on the role of individual differences and personality factors that are now strongly believed to modulate this relationship. An accumulating wealth of evidence is suggesting that any explanation for such individual differences in emotional experience requires the integration of biological (genetic, neuropsychological, endocrine), personality, and cognitive and behavioural factors. While this view makes perfect sense, it owes much of its validity to the work of several pioneering researchers who, through their contributions, have unraveled the dynamics amongst these interrelated factors with increasing precision. Without question, the pioneering work of Professor Michael Eysenck has played a leading and most inspirational role in advancing the field of cognition and emotion in a number of important ways.

Michael Eysenck's work covers many different facets of personality, cognition, and emotion. In his career, he has published outstanding research on the cognitive processes involved in anxiety. To celebrate Michael Eysenck's significant contributions to the study of cognition in psychopathology, and the importance of integrative work in this area, this special issue will highlight a number of contributions that centre around the cognitive neuroscientific and psychobiological approaches to emotional information processing in psychopathology. In line with Michael Eysenck's theoretical ideas, information-processing and attentional control are dominant themes across a diversity of interesting specific studies and theoretical models. We start with a brief overview of Michael Eysenck's career and will then provide an outline of the Special Issue.

Career Highlights

Michael Eysenck was born in 1944 in London (UK), son of the famous British psychologist Hans Eysenck. In 1965, Michael Eysenck received his BA in psychology with first class honors from UCL to further pursue a career in cognitive psychology, and earned his PhD on the topic of “conditions modifying memory: The von Restdorff and the ‘release’ effect”. He was appointed as lecturer at Birkbeck College University of London where he remained to earn the title of Reader in Psychology. In the late 1970’s, Michael Eysenck published his first textbook: “Human memory: Theory, research and individual differences”, a first of many to follow. His research in the 1970’s played a critical role in advancing major theories on memory in relation to individual differences in extraversion (Eysenck, 1976) and also in relation to arousal (Eysenck, 1977); such theories which are still influential to this day (see Baddeley, Eysenck, & Anderson, 2009). It is important to note that at this time it was clear that Michael Eysenck’s research was not bound to singular phenomena and perspectives. Instead his research was a reflection of his remarkable talent in explaining and relating psychological phenomena with remarkable eloquence and insight. The breadth of these phenomena ensured that many of the ideas he postulated were applied in a number of different disciplines within psychology.

In the 1980’s new major achievements followed. Just to name a few, the monograph on attention and arousal published in 1982 had a major impact on the relation between anxiety and performance. Moreover, his handbook of cognitive psychology (1st – 6th edition; 1984 – 2011) became an important key textbook for anyone (including undergraduate as well as graduate students and academics alike) studying cognitive psychology. In the 1980’s Michael Eysenck also published a series of articles on the influence of (trait) anxiety on cognitive functioning. This work ultimately lead to two research monographs (Anxiety: A cognitive perspective, 1992; and, Anxiety and Cognition: A unified theory, 1997) outlining a cognitive perspective on anxiety and its disorders which are to this day considered hallmark cognitive

theories on anxiety. In 1987, Michael Eysenck moved to Royal Holloway University of London to take up a full professorship, where he would stay for the rest of his research career.

In subsequent years, Michael Eysenck continued to inspire the field of anxiety and cognition by applying his knowledge of cognitive psychology to further delineate many of the cognitive processing characteristics of anxiety, which originated at the level of memory and attention but also now included inferences and interpretations due to innovative and careful studies. One important feature of his studies was that they did not just provide new empirical data to better understand the detrimental effects of anxiety on cognition. Instead, the empirical work was embedded in a clear theory-driven and systematic approach to understand cognitive processes across a range of personality features where the empirical data often gave rise to new and most influential theoretical insights. One of the major theoretical achievements, published in 1992, was represented in an article co-authored by Manuel Calvo on “Anxiety and cognitive performance: The processing efficiency theory”. In this theory they proposed that it makes sense to differentiate between cognitive effectiveness and cognitive efficiency, as these processes could be differentially affected by personality traits and/or certain conditions. This distinction had a major impact on the field and lay the foundation of the more recently published Attentional Control Theory (Eysenck, Derakshan, Santos, & Calvo, 2007), a major development of Processing Efficiency Theory, that provided a more detailed account of anxiety-related influences on working memory functions and cognitive performance. Indeed this theory has seen a substantial increasing level of support from recent cognitive neuroscience work. Both of these theoretical papers are of profound influence in the current literature on anxiety and cognition and are highly cited.

Next to these influential papers, Michael Eysenck has shown a strong dedication to translating emerging findings from the cognitive psychology literature into both undergraduate as well as graduate textbooks. To this day Michael Eysenck has either sole-

authored or co-authored 42 textbooks many of which have been translated into different languages. These textbooks have been very successful due to Michael Eysenck's ability to explain sophisticated material in an accessible and engaging manner without reverting to simplification. The elegance and clarity of his writing has undoubtedly impressed anyone who has read his books, chapters, or articles.

In addition to his scientific writings Michael Eysenck has also generously contributed to the advancement of cognitive psychology in numerous ways. He was one of the founding members of the European Society of Cognitive Psychology and has served as president for the International Society for Stress and Anxiety Research. He also carried several editorial duties. He served as founding editor for the *European Journal of Cognitive Psychology* and has served on editorial boards of several major journals in the field of cognitive-experimental psychology. He was an often-invited speaker at many major international conferences and has supervised numerous students to successfully complete their PhD.

As of 2009 he is Professor Emeritus at Royal Holloway, University of London and he currently also holds a position as Professorial Fellow at Roehampton University.

The Special Issue

The special issue consists of a collection of empirical papers as well as a number of reviews on cognition, emotion, and psychopathology. These papers have been written by a number of eminent scholars who helped transform the field of cognition and emotion in their own right, including, but not restricted to collaborators and former students of Michael Eysenck. The special issue provides a state-of-the-art update on current thinking about information-processing in relation to emotion and psychopathology. Each contribution can be

related directly to the work initiated by Michael Eysenck and in this way underscores the legacy of this eminent scholar.

The papers are on the broad topic of information processing of emotional information in relation to individual differences in anxiety and depression. This area of research has witnessed a tremendous growth in the past forty years. Where this area arose during the cognitive revolution in the 1960's, it took more than a decade before researchers began systematically investigating the role of emotional factors, such as valence and arousal on information processing and began considering the role of individual differences. Currently, this is one of the most exciting areas in experimental psychopathology research.

The special issue can be divided into three main sections, each of which has profited from the seminal studies of Michael Eysenck: (1) memory processes; (2) attentional processes; and (3) interpretation bias.

The section on memory is comprised of a paper on the role of working memory and affect authored by Baddeley, Banse, Huang and Page (this issue). This paper presents two experiments aimed at examining a suitable methodology to test some of the core predictions of the influence of mood on working memory processes involved in hedonic judgments as proposed by Baddeley (2007). The authors advocate the use of a task requiring affective judgments of 'neutral' stimuli as a way to examine the influence of negative and positive mood on working memory. The authors observed that negative mood compared with positive mood influenced subsequent hedonic judgments.

In the section on attentional processes, a first paper by Öhman and colleagues provides a review on the mechanisms underlying attentive processing of threat within an evolutionary framework. Their data suggests that attentive processing is shaped by the demands that adaptive responding requires for certain classes of stimuli. This paper builds on their

influential idea that cognitive processing of threat is a hard-wired mechanism that has evolved through evolutionary influences related to the adaptive value of prompt detection and responding to threat (Öhman & Mineka, 2001). As recent years have seen several arguments against the idea that threat processing is automatic and encapsulated from higher-order cognitive influences (e.g., Pessoa, & Adolphs, 2010), the new paper by Öhman et al. is likely to revitalize this debate.

A second article in this section represents another interesting advancement in the area of attentional bias for emotional information and individual differences. The extensive literature in this area typically only focuses on attentional bias for emotional information in relation to negative affect (e.g., anxiety and depression). Grafton, Watkins and MacLeod (this issue) examine the influence of both negative and positive affectivity on an interesting new modification of the attentional probe task that allows the separation of cognitive processes related to attentional engagement and disengagement. They find that anxiety-related negative affectivity is characterized by an increase in attentional preference for negative relative to positive information both at the level of facilitated attentional engagement with, and impaired attentional disengagement from, such information. Attenuated depression-related positive affectivity instead is characterized by reduced attentional preference for negative information relative to positive information, and this bias is due to enhanced attentional disengagement from such information. This dissociation between the attentional characteristics of negative and positive affect helps to explain the pattern of attentional bias in anxiety and depression.

Two papers have complemented the use of cognitive—experimental attentional tasks with eye-movement methodology to obtain a more complete picture of the time course of threat processing. Both studies have examined the processing of emotional facial expressions in relation to anxiety vulnerability. A first study by Reinholt-Dunne et al. (this issue) used the antisaccade task which is an increasingly popular task to examine the inhibition of reflexive

saccades to appearing peripheral cues (see Derakshan & Eysenck, 2009). This study found that high anxious individuals had more difficulty to shift gaze away from threatening compared with neutral facial expressions. The study by Berggren, Koster and Derakshan (this issue) also examined behavioral responding as well as eye-movements. They investigated whether processing of emotional facial expressions was dependent on cognitive load using a visual search paradigm, which provides a test of the theoretical idea that threat is processed in an 'automatic' way. They found that manual responding indicated emotional information captured attention more strongly than neutral information on trials where the crowd had a different emotional valence than the targets. The eye movement data showed that this effect was caused by delayed target processing efficiency in such trials. Additionally, trait anxiety did not influence threat processing, but costs were observed under cognitive load that were not present for non-anxious participants. These results suggest that cognitive load mainly interfered with task performance but not with emotion processing. Finally, this section ends with a paper by Calvo Gutiérrez, and Fernández-Martín (this issue) who investigated several features of threat processing. They examined whether interference of threatening words differed as a function of foveal vs. parafoveal presentation of these words in relation to anxiety levels in two experiments. Their results suggest that anxious individuals do not show enhanced preattentive processing of threatening words but that they have reduced inhibitory control over threat processing when threat is attended.

The section on interpretive processing in psychopathology starts with a review paper by Mathews (this issue) who describes how the field of interpretive bias research has evolved from the initial groundbreaking studies of Michael Eysenck to the more recent work that examines whether interpretive bias plays a causal role in anxiety vulnerability. This review paper describes in depth the different ways to investigate and modify interpretive bias.

Moreover, a clear overview is provided about both the theoretical and clinical application of such innovative procedures.

Recent work on genetic vulnerability to anxiety and depression has linked genes that are thought to be related to these disorders to emotion-specific biases in information processing. Particularly, it has been shown that the 'serotonin transporter gene' (5-HTT gene) plays an important role in the susceptibility for social signals (Homberg & Lesch, 2011). In a groundbreaking paper, Fox and Standage (this issue) show that a negative interpretive bias is related to variations in this serotonin transporter gene. This study contributes to a growing literature that helps to explain in ways in which genes heighten susceptibility to anxiety and depression.

Collectively, these papers showcase the exciting developments in the field of information-processing, affect and psychopathology. Clearly, this field will continue to profit from the seminal work of Michael Eysenck who was among the first to link the study of cognitive processes to individual differences, affect, and psychopathology.

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