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Obituary

Michel Treisman (1929–2023): A Short Appreciation of his Contributions to the Study of Time Perception

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With the recent death of Michel Treisman at 93, the field of time perception has lost one of its most important historical figures. No one working in the area can be unaware of his monumental 1963 monograph, and most will be familiar with his later work on repetitive stimulation and its effects on time perception. Michel Treisman made many important contributions to experimental Psychology outside the time perception field, to say nothing of his other achievements, see https://www.theguardian.com/education/2023/apr/21/michel-treisman-obituary. Attendees at timing conferences will recall his lively participation, and acute questioning of speakers, even when well into his 80s. Those who thought that he personified their idea of an elderly Oxford don, physically somewhat frail but mentally sharp as a razor, may be surprised to find that he was born and raised in South Africa, where he qualified as a physician, before turning to Psychology at Oxford only in the mid-1950s.

His 1963 monograph is an astonishing achievement, without much previous precedent in terms of its scope and complexity, and rarely if ever equalled since. More remarkably still, as Treisman himself recounted (Treisman, 2013), he had little interest in time perception when he first started the work. His curiosity about timing was sparked (perhaps literally) by his discovery of effects of the timing of warning signals which preceded the production of *phosphenes*, flashes of light seen when an electric current is passed through the retina.

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The 1963 monograph deserves a much fuller exegesis than I am able to give here, where I can mention only a few of its remarkable aspects. For one thing, although the internal clock model he developed attracted most interest, albeit somewhat belatedly, the 1963 monograph presented data from seven experiments, including studies of reproduction, production, and stimulus duration discrimination. In both the experimental and theoretical work he did, classic questions of conformity of data from timing experiments to Weber's Law and Vierordt's Law were central. In addition, Treisman was fascinated by changes in performance as experimental sessions proceeded, where systematic apparent lengthening or shortening of durations occurred, a theme that links several of his experiments. His theoretical model, which he called the *Information-Processing Model of Timing,* broke new ground in many important ways. As its title suggests, it embodied the venerable idea of an arousal-sensitive internal pacemaker in a more general cognitive model, involving memory and decision processes, what Treisman (2013) later called the "clockwork". Without this "clockwork", performance on any real timing task cannot be properly addressed, whatever ideas about potential internal timekeepers might be proposed, a message not always absorbed even to this day. The model dealt also explicitly, for the first time, with questions about how time intervals are stored, retrieved and compared when different timing tasks are carried out. In addition, the 1960s-style "black box" diagram of his model was supplemented by an elaborate algebraic specification of how its different components operated, allowing much more precise quantitative predictions of performance on a number of timing tasks than had been possible before. In spite of its scope and originality

> "the publication of the … model in 1963 met with little immediate response. Outside a small circle, there was not much interest in work on time at that period and for some time later. The situation has now changed" (Treisman, 2013, p. 147).

Indeed it has, according to Google Scholar, the 1963 monograph is not only Treisman's most cited work by far, but one of the most-cited works in the field of time perception.

Treisman's second foray into timing research, nearly thirty years after the first, involved exploration of what he called a "Calibrated Pacemaker" model, where the normally fairly stable output of an oscillator-like pacemaker is modified by a "calibration unit", the setting of which is determined by arousal. In a series of studies, starting with Treisman, Faulkner, Naish, and Brogan (1990) he attempted to uncover the frequency of this underlying oscillator. The method used a sort of interference effect evoked by trains of repetitive stimulation of different frequencies, the idea being that a frequency of external stimulation close to the oscillator period would cause specific changes in activity which could be observed in timing data, thus revealing what the oscillator frequency was. Once again, the whole body

of work is much too complex for proper discussion here, but Treisman (2013) noted that this sort of method might be useful for studying underlying timing processes in children or patient groups, then ruefully commented that "statutory retirement, lack of research support, and loss of laboratory facilities" prevented him doing more work on this topic.

I only met Michel a handful of times, so did not know him well enough to write an intimate personal memoir. My last memory of him is of the two of us sitting in a café under the Corfu sun, where I was honoured to buy lunch for this intellectual giant of time perception.

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