

SPR AWARD, 2005

For distinguished contributions to psychophysiology: Cornelis H. M. Brunia

STEVEN A. HACKLEY

Department of Psychology, University of Missouri, Columbia, Missouri, USA

The Distinguished Contributions to Psychophysiology Award is the highest recognition offered by our Society. Its importance is conveyed by the names of its previous recipients. These include John and Beatrice Lacey, Frances Graham, Yevgeny Sokolov, Steve Hillyard, Peter Lang, Manny Donchin, Risto Näätänen, and a small set of others in the Society's history. To this eminent list we now add Cornelis H. M. Brunia.

Criteria include scientific achievements, service to the Society, and the training of students and junior associates. The most important of these is scientific achievements, and Kees Brunia's three most important accomplishments are clear: The integration of reflex probe methods into psychophysiology, the discovery of paradoxical lateralization of the readiness potential, and characterization of the Stimulus Preceding Negativity.

As a neurologist, Kees had learned in medical school how to use reflexes to diagnose neuropathies and other disorders. It was during a visit to Paillard's lab in Marseille that he saw how reflexes could be used to study psychologically relevant issues. He started with simple manipulations like task versus non-task conditions or drug versus placebo, and then progressed to cognitively more sophisticated designs. These studies helped disentangle the processes that can modulate reflexes during reaction time tasks—immediate arousal, anticipatory attention, response preparation, response execution. They also introduced psychophysiology to the idea of using a reflex as a probe to measure something else. Kees Brunia's reflex studies are still widely cited in action psychology and motor physiology.

Kees's second major contribution was the discovery of paradoxical lateralization of the readiness potential. Specifically, the negativity recorded prior to foot movements is bigger over the hemisphere on the same side as the foot rather than over the contralateral hemisphere. Of course, voluntary foot movements are controlled by contralateral motor cortex, just like movements of any other part of the body. The explanation for paradoxical lateralization, Kees realized, is that the foot representation in M1

lies on the mesial surface, deep within the interhemispheric fissure. This patch of cortex points towards the opposite side of the head, the side ipsilateral to the moving foot.

Paradoxical lateralization had previously been reported for certain visual-evoked potentials. But I can tell you that in the field of visual electrophysiology this is viewed as little more than a laboratory curiosity. By contrast, paradoxical lateralization of movement-related potentials is important. It's important because it allows M1 to be distinguished from other motor areas. M1 is the only motor area whose somatotopic mapping yields opposite lateralization for hand and foot movements.

Kees's third major contribution was isolating the Stimulus Preceding Negativity from other slow waves within the contingent negative variation (CNV) family. Here's the historical context: John Rohrbaugh had presented evidence in 1976 that the late CNV, the part observed towards the end of the warning interval, could be entirely explained by the readiness potential.

However, other psychophysiologicalists then presented evidence that the late CNV can be observed even when no motor response is required at all. Hence, there should be no readiness potential. For example, Bob Simons, Arne Öhman, and Peter Lang reported a late CNV when subjects were simply waiting to observe an emotion-inducing slide. But then critics responded that the subjects might have been preparing eye movements to scan the slide or, alternatively, the warning signal might have triggered a prolonged sensory evoked potential.

Kees Brunia and his colleagues resolved this controversy by devising a clever paradigm that compared two serial time intervals. The first interval engaged motor preparation without stimulus anticipation. For the second interval, it was the reverse, stimulus anticipation without response preparation. In an extensive and systematic program of research, Kees Brunia and his colleagues used this paradigm to differentiate the Stimulus Preceding Negativity from the Readiness Potential.

In summary, Kees's three most important scientific contributions concerned reflex probes, paradoxical lateralization, and Stimulus Preceding Negativity. In terms of service to the field, the committee noted that Kees has served on the editorial boards of five relevant journals, that he helped organize several major conferences, and that he served both as president and as a member of the Board of Directors of SPR.

SPR is proud to present its 2005 Distinguished Contributions to Psychophysiology Award to Cornelis H. M. Brunia.

At the forty-fifth annual meeting of the Society for Psychophysiological Research, the award for Distinguished Contributions to Psychophysiology was presented to Cornelis H. M. Brunia. This article comprises the citation given by Steven A. Hackley on behalf of the Society's Awards Committee on October 9, 2005.

Address reprint requests to: Steven A. Hackley, Department of Psychological Sciences, University of Missouri-Columbia, 210 McAlester Hall, Columbia, MO 65211, USA. E-mail: HackleyS@missouri.edu

SUPPORTING INFORMATION

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APPENDIX S1. Author Bibliography

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