Prayer and Neuroimaging: Concepts and Feasibility

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Abstract
Long recognized as a defining feature of religion, prayer, paradoxically, has received only sporadic empirical attention. Recent investigations in the U.S. and the Netherlands have sought to address this gap by exploring the topic of prayer in programmatic fashions, significantly advancing the state of the art in terms of measurement of the practice of private prayer. The present paper first offers one way to integrate and expand the contemporary prayer literature using a conceptual analysis of religion. Second, challenges and possibilities associated with moving from this synthetic definition to neuroimaging work are examined within the framework of social cognitive neuroscience.

Keywords: neuroscience, prayer, theory, critique, review, methodology, social cognitive neuroscience

Słowa kluczowe: neuronauka, modlitwa, teoria, krytyka, recenzja, metodologia, społeczno-pożnawcza neuronauka

Long recognized as a defining feature of religion, prayer, paradoxically, has received only sporadic empirical attention. Recent investigations in the U.S. and the Netherlands have sought to address this lacuna by exploring the topic of prayer in programmatic fashions, significantly advancing the state of the art in terms of measurement of the practice of private prayer. Specifically, Baesler\(^1\) emphasized interpersonal communication aspects of prayer while Janssen\(^2\) and colleagues evaluated motivations for praying. Additional independent efforts have reviewed and consolidated discrete ways that people approach prayer as a means of forming connections inward (with


their own spirit), outward (with other people), and upward (with the divine) providing evidence of the reliability and validity of the developed scales. In other words, reliable and valid instruments exist to quantify self-reported prayer experiences.

Simultaneous with the psychometric work on prayer, researchers began exploring cognitive and neural aspects of religious experiences. Many of these nascent investigations suggest that religious experiences may differ at the cognitive and neural levels from various other mental states such as relaxation. A frequent component of these protocols that use tools of modern neuroscience is the use of meditation or prayer as a mechanism to invoke physiological change. Unclear, however, are the precise nature and characteristics of the meditations or prayers that the participants utilize, rendering findings ambiguous.

The psychometrics of prayer and the neuroscience of religion are coming of age rapidly and interdisciplinary research linking the fields will help expand their investigative spheres. Prayer research could be significantly advanced by moving into a realm where self-report is augmented by physiological data. Likewise, the neuroscience of religion will benefit from the introduction of psychometrically sound definitions of the phenomenon under exploration.

The present work outlines the challenges and possibilities associated with the development of a protocol for merging these two streams of inquiry. In this paper, we evaluate concerns from theoretical and theological to pragmatic (e.g., human vs. computer generated stimulus), indicating their respective benefits and challenges in order to set the stage for a discussion concerning “best practices” in the area.

The application of neuroimaging techniques to the study of prayer experiences will surely strike some people as thoroughly sacrilegious and others as purely ludicrous. We are well aware of both varieties of criticism and hope in the following paper to convince, if not outright convert, at least a few of the skeptics that such interdisciplinary work has merit despite its perceived substantial limitations.

To that end, we believe it is imperative to begin by clearly delineating our vantage points with respect to both prayer and neuroimaging. These terms have many meanings within their native areas of practice and it is our desire to be as precise as possible.

