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Neuroscience and generalized empirical method: a response to A. Rastogi

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Thank you to Mr. Rastogi for responding (Rastogi, 2014) to my article (Henman, 2013) on generalized empirical method. It is not possible to respond to all of Rastogi's comments in a dialogue-form article so I limit myself to central features of his response.

In the first place, the implementation of generalized empirical method does not challenge the principle of commonality in neuroscience. The individual cognitive operations - as outlined in my original article - will manifest limited and minor differences in correlates, but the content of a mental act will also be a contributing factor to changes in cerebral activity. Both the strength of connectivity and the direction from target to source will differ depending on the operation occurring and the content of the operation (Harrison, 2008). Experiments with different insights have revealed different types of restructuring activity as well as more numerous correlates than most other mental acts (Gulyas, 2009, p.256). Commonality of regional activity is maintained to a limit but also subject to the stochastic plasticity of the cerebral organ.

Generalized empirical method is not an idea; it is an acknowledgment of the empirical reality of the operations of conscious cognitional activity. All data, of sense and of consciousness, manifest through the cognitive acts immanent intelligibility as do the operations of cognition. It is these operations that discover and thematize the intelligibility immanent in data. In other words, they are the origin of meaning and when they are understood scientifically, the researcher has a higher control of meaning in both the horizons of common sense and theory. As data, the operations are intelligible; as operations, they are intelligent (Lonergan, 1992, p.346).

A scientist does not have to be a neuroscientist in order to establish a nominal account of a theory of thinking. An explanatory account resulting in a definition would require scientific work within the context of Bernard Lonergan's methodical work, *Insight* (Lonergan, 1992, p.35, 357-358). But one must do some science in some field, or some form of puzzling, to provide the data so that one may reflect on one's performance in order to lift the awareness of these operations into a scientific perspective (Lonergan, 1992, p.353-357). Furthermore, generalized empirical method reveals the need to determine the functions of both the biological cerebral organ and the conscious operations and their corresponding relationships within the context of emergent probability. (Lonergan, 1992, chapter 15, sections 6 & 7, Chapter 4, sections 2.4 & 2.5) There is the need in all the sciences for scientists to advert to their own operations to provide a more systematic and common foundational approach to their work in order to increase the probabilities of cumulative and progressive results.

Generalized empirical method offers the ground for a division of labour by recognizing that each operation relates to a different task in the scientific venture (Anderson, 1996, p.167; McShane, 2013, chapter 14; Shute, 2010, p.233-243) - *attention*, the activity of gathering relevant data; *understanding*, the task of interpreting the

data; *judgment*, lining up the different interpretations within their historical context; and finally *decision*, determining which interpretation is the best explanation. These tasks need to be divided, as no scientist in contemporary research can remain abreast of all that is going on in his or her field. Generalized empirical method provides the possibility of intelligent collaboration and development, which functional specialization will reveal over time. The functional specialist approach is grounded in the different tasks relating to the cognitional levels and not in different types of data. Implementation of the best available explanation requires four further divisions: *foundations*, *policies*, *systematics* and *communications*. (Shute, 2010, p.236) There are two stages, the first four specialities bring forward work and the second stage of four specialities, are orientated to the future.

As for the injection of the researcher's subjectivity into one's work, the issue is; do we understand in an explanatory context just what subjectivity is? If this procedure is an "intrinsic quality in the objectivity of the scan data itself" (Rastogi, 2014) and yet unknown as to what it is or how such an intrinsic quality functions, we have an unknown variable in the scientific procedure. That unknown can be known by beginning with the question; what am I doing when I am knowing? The major hurdle here is the difficulty in expanding one's notion of empirical beyond the positivism that has pervaded science for over a century.[a] Generalized empirical method which includes both the data of sense and the data of consciousness will over time reveal an explanatory account of human subjectivity and its relationship to scientific research.

Finally, I wish to thank Mr. Rastogi for taking the time to respond offering me an opportunity to expand on the central topic of my original article. A fuller account of the implications of generalized empirical method and Rastogi's comments would require much more than can be offered in a brief article.

Endnote

a: I am presently carrying out research on the reductionist language used in neuro cognitive science which will not only help manifest the cognitive operations as data but also provide theoretical possibilities for the explaining of the functions and relationships between the data of the cerebral organ and the conscious cognitive operations that every researcher utilizes in their work.

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