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Characterising Textual Memorization of Brain Structure Using Fractal Analysis

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ABSTRACT

Fractal Analysis (FA) has been extensively used in medical field nowadays. Since its development in 1983, FA is capable of representing an estimation of morphological complexity including the brain structure. However, the application of FA in characterizing textual memorization brain structure is still lacking as compared to its application in detecting pathologies in the brain as well as measuring the impact of aging to the brain. Thus this study interested in characterizing the textual memorization brain structure using the FA, and analysed the information in grey scale features. During the first phase of the study, 60 participants were recruited, with 30 normal participants act as a control group and 30 subjects of Huffaz (person who memorize the Quran). Local ethical approval has been sought with ID No. IREC 654 dated 5th September 2016. In second phase, the participants (Huffaz and Non-Huffaz) were scanned under Magnetic Resonace Imaging in order to acquire their brain structural information. Those two phases mentioned earlier have been completed. In third phase, which is still ongoing, the images acquired will then undergo pre-processing steps before being subjected to analysis using FA. Upon completion of FA, the possible brain areas that have significant changes by textual memorization will be identified and modelled. It is expected that upon completion of this study, the established grayscale features that discriminate between Huffaz and Non-Huffaz can be formulated, enabling us to model Huffaz textual memorization brain structure by using FA. It is also hoped that this study will be able to specify the brain areas that specifically changed from the textual memorization.

KEYWORDS: Fractal Analysis; Huffaz; Brain; Magnetic Resonance Imaging; Textual Memorization

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