

Theory of Mind deficit in the behavioral variant of frontotemporal dementia and in amyotrophic lateral sclerosis: Why does it matter?

Marco Cavallo^{1,2*}

¹eCampus University, Novedrate (Como), Italy

²Mental Health Department - Azienda Sanitaria Locale Torino 3, Italy

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***Corresponding author:** Marco Cavallo, Neuropsychologist, Researcher at the faculty of Psychology of the eCampus University of Novedrate, Italy, Tel no: +39.3478306430; Email: marco.cavallo@unicampus.it

Editorial

Theory of Mind (hereinafter referred to as ToM) is the ability to explain and predict other people's behavior by attributing independent mental states to them. It allows us to recognize that mental states such as beliefs, intentions, and desires play a key role in driving and monitoring human behavior. Impairment in ToM ability can be highly disabling. ToM had been extensively studied in neuropsychiatric conditions such as autism and certain manifestations of schizophrenia [1], but only recently researchers and clinicians have started to investigate ToM in neurodegenerative conditions, such as the behavioral variant of frontotemporal dementia (bv-FTD) and amyotrophic lateral sclerosis (ALS).

In this Editorial, I am briefly considering recent studies in this important domain, with the two fold aim of introducing the evidence available to date, and suggesting the importance of scheduling a detailed diagnostic ToM assessment during the early stages of these neurodegenerative conditions already. In a systematic review of ToM deficits in the bv-FTD, Adenzato et al. [2] considered all of the studies previously published on this topic. All of them reported the presence of a breakdown in social conduct and dramatic personality changes in patients' lives, coupled with a significant and specific decay in ToM capacity as measured by classical experimental tasks such as the false belief tasks, the Reading the Mind in the Eyes, and the faux pas [2]. We then took a step further, and started to investigate the construct of social understanding in these clinical conditions. Social understanding refers to the everyday-life complex ability of interpreting social situations properly. In one of the first studies on the topic, Cavallo et al. [3] investigated the possible presence of such a deficit in small groups encompassing bv-FTD patients and matched healthy controls. Our findings suggested the presence of patients' significant difficulties in attributing mental states to others appropriately and interpreting properly

stories that explicitly referred to social situations. Our results underlined the needs for further research to gain a deeper understanding on the possible link between patient's behavioral problems and their limited understanding of social situations.

We also aimed at clarifying the nature of the ToM deficits associated with ALS, a neurodegenerative disease that from cognitive and neuroimaging points of view appears to share some relevant commonalities with bv-FTD. In this study [4] we hypothesized that the performance of patients with ALS were significantly worse than healthy controls' performance on tasks requiring the comprehension of social contexts, whereas patients' performance were comparable to healthy controls' performance on tasks not implying the social dimension. We administered patients with ALS and healthy controls an experimental protocol that distinguishes between social and non-social intentions. The pattern of results showed that patients significantly differed from controls on the comprehension of social contexts only. Single case analysis confirmed the findings also at an individual level. The present study was the first that examined the understanding of ToM-driven social contexts in patients with ALS, and showed a specific and selective deficit in this domain. Along this vein, Van der Hulst et al. [5] recently administered the Cognitive-Affective Judgement of Preference Test to patients with ALS and controls, and interestingly showed that dysfunctional ToM was a prominent feature of the cognitive profile of ALS.

To conclude, growing evidence shows that specific ToM problems characterize the clinical profile of bv-FTD and ALS, suggesting that the neuropsychiatric profile of these neurodegenerative diseases be at least partially explained by a significant deficit in ToM domain. Thus, researchers and clinicians are urgently called upon to include a detailed ToM assessment into the early diagnostic procedures of these conditions, and to implement effective behavior management strategies when working clinically with patients and their caregivers.

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