

LETTER TO THE EDITOR

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Impaired self-conscious emotion ratings in frontotemporal dementia

Patients with behavioral variant frontotemporal dementia (bvFTD) have impairments in the self-conscious emotions that guide social behavior (Sturm *et al.*, 2006, 2008). Among early-onset dementias, bvFTD is second only to Alzheimer's disease (AD), the most common cause of dementia and one frequently confused with bvFTD. The absence of self-conscious emotions can help in distinguishing bvFTD from AD and other conditions on initial presentation. Patients with bvFTD, however, lack emotional insight (Mendez and Shapira, 2011), and their self-reports of emotions may not be reliable. This pilot study investigates the value of caregiver ratings of self-conscious emotions vs. a self-report scale of ease of embarrassment in patients with bvFTD compared to those with AD. It further validates these assessments with skin conduction responses (SCRs) to an embarrassing event.

Methods

The study included seven patients who met International Consensus Criteria for clinically probable behavioral variant FTD (Rascovsky *et al.*, 2011), seven who met National Institute on Aging-Alzheimer's Association criteria for clinically

probably AD (McKhann *et al.*, 2011), and seven healthy comparison (HC) volunteers. 1.) Caregivers rated the patient's self-awareness of 10 self-conscious emotions such as embarrassment and guilt on a scale of 0 to 2 (Mendez *et al.*, 2021). 2.) Participants completed the 36-item Embarrassability (EMB) Scale in which they were asked to imagine themselves in embarrassing situations and record their own level of embarrassment or self-consciousness on a 5-point Likert scale (Mendez *et al.*, 2020). 3.) Participants were seated in a quiet room three feet from a monitor and underwent continuous SCR recordings (Biopac MP150; GSR 100C; AcqKnowledge v4.1 software; 5 μ S/V, low-pass filter 1Hz, no high-pass filter, 31.25 Hz sampling rate). They were first recorded during a 2-minute participation in research tasks requiring stimulus discrimination, and then, after a short delay, they were unexpectedly presented with the 2-minute videos of themselves, which they viewed in the presence of an audience of three researchers.

Results

The dementia groups significantly differed on self-conscious emotion ratings and on the SCR during self-viewing, with the participants with bvFTD most impaired on both (See Table 1). There were no significant differences between the bvFTD and the AD groups on the EMB scale, nor between all three groups in reporting "self-consciousness" during self-viewing (4 bvFTD, 5 AD, and 5 HC). Partial

Table 1. Participant Characteristics: Behavioral variant frontotemporal dementia (bvFTD), Alzheimer's disease (AD), and healthy comparison (HC) groups

	bvFTD (7)	AD (7)	HC (7)	P-VALUE*
Age	62.17 (8.21)	60.14 (6.99)	53.14 (11.28)	0.173
Education	16.16 (2.04)	16.57 (1.99)	16.86 (1.46)	0.779
Sex (male and female)	(3, 4)	(1, 6)	(1, 6)	0.350
Mini mental state examination	23.75 (8.03)	25.86 (2.61)	29.71 (0.49)	0.096
Montreal cognitive assessment	22.15 (5.71)	21.50 (0.71)	n/a	0.770
Disease duration (years)	3.73 (2.92)	3.43 (1.81)	n/a	0.821
Self-conscious emotion ratings	10.57 (3.83)	31.28 (4.23)	n/a	<0.0001**
Embarrassability (EMB) Scale	115.08 (28.70)	106.30 (23.90)	n/a	0.546
Skin conduction responses (SCRs)	0.037 (0.059)	0.994 (0.172)	0.352 (0.094)	<0.0001***

Means and standard deviations except for sex.

*Three-group one-way ANOVAs except χ^2 for sex; two-group t-tests.

** $t = 9.602$, $df = 12$.

*** $F = 119.218$, $df = 2, 18$, Tukey's HSD post hoc bvFTD vs AD and AD vs. HC both <0.0001; bvFTD vs HC <0.0003.

Pearson's correlation, which controlled for dementia group membership, between the self-conscious emotion ratings and SCR was 0.589, significant at the $p < 0.05$ level (two-tailed). There was no significant correlation between the EMB scale and either the self-conscious emotion ratings or the SCR.

In this pilot study, participants with bvFTD, compared to those with AD, had decreased self-conscious emotions on caregiver ratings, and they had confirmatory impairment of SCR, a physiological index of emotion. These two measures significantly correlated even after controlling for dementia diagnosis. Yet, their self-reports of embarrassment were not different than those for the AD patients, emphasizing the need to avoid self-reports and the necessity for caregiver ratings, as bvFTD patients lack emotional insight and self-awareness (Mendez and Shapira, 2011). The finding of this preliminary study should lead to a larger investigation of the value of a screen for self-conscious emotions screen when first evaluating patients for possible bvFTD.

Conflict of interest

None.

Author roles

MFM analyzed and wrote paper; EEJ organized and supervised the research.

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