

ASSESSING SOCIAL COGNITION IN ALS AND CHRONIC PAIN: VALIDATION OF THE FACE TEST

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OBJECTIVES

Deficits in social cognition are hallmark of several neurological and psychiatric disorders, yet standardized tools for their assessment remain limited. This study aims to validate the **Facial Complex Expressions (FACE) test (1)**, a novel instrument designed to evaluate the ability to recognize complex mental states from facial expressions, in:

- **Amyotrophic Lateral Sclerosis (ALS)**, a neurodegenerative disorder characterized by progressive motor impairment and, in approximately half of cases, cognitive and behavioural changes (2);
- **Chronic pain (CP) diseases**, which are known to negatively impact emotional and cognitive functioning (3).

MATERIALS AND METHODS:

We enrolled **166 ALS patients** and **58 CP patients**. All participants underwent a neuropsychological battery assessing executive function, memory, and language domains.

Social cognition was assessed through the **Story-Based Empathy Task (SET)**, comprising Causal Inference (SET-CI), Emotion Attribution (SET-EA), and Intention Attribution (SET-IA).

ALS patients also completed the Edinburgh Cognitive and Behavioural ALS Screen (ECAS).

Within clinical samples, partial correlations (controlling for age and education) were used to assess the FACE convergent and divergent validity. Bonferroni correction was applied.

Fig. 1: FACE Test performances in ALS and CP

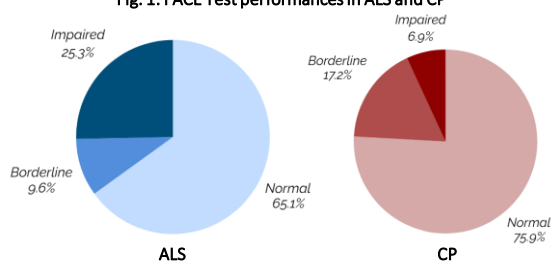
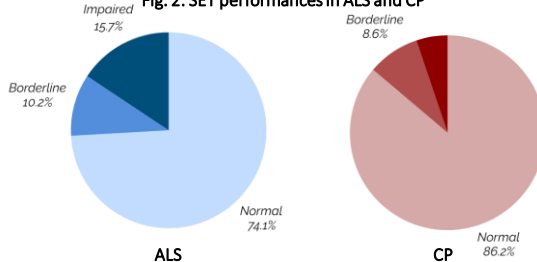


Fig. 2: SET performances in ALS and CP



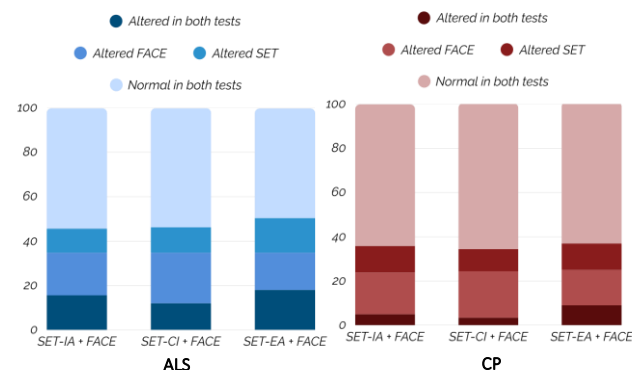
Results:

Borderline/impaired performance on social cognition tasks are reported in **Fig. 1** and **Fig. 2**. The co-occurrence of pathological performances across FACE and SET tasks are reported in **Fig. 3**.

Convergent validity → in ALS, FACE performances correlated significantly ($p < .001$) with social cognition tasks - SET total ($r_s=.346$), SET-IA ($r_s=.399$) and SET-EA ($r_s=.357$) - and ECAS executive functions ($r_s=.351$). No significant correlations surviving Bonferroni correction emerged in the CP group.

Divergent validity → Language, memory and visuo-spatial tasks were not associated with FACE task performance, with the exception of ECAS memory subtest in the ALS sample ($r_s=.316$, $p < 0.001$)

Fig. 3: Co-occurrence of pathological performances across social cognition tasks



DISCUSSION:

The results confirmed the presence of social cognition deficits in one third of patients with ALS. The significant correlations between FACE and SET-IA and SET-EA suggested that it captures both cognitive and affective dimension of social cognition. In contrast, CP patients exhibited less pronounced impairments and FACE and SET appear useful for identifying distinct aspects of social cognition. These findings may be explained by the progressive frontotemporal involvement characteristic of ALS, which is absent in CP. Neuroimaging studies may clarify the neural substrates underlying these differences.

Conclusion: Overall, our findings support the validity of the FACE as a tool for detecting social cognitive deficits in ALS. In CP, it may provide complementary insights into the broader cognitive profile.