

# Social Cognition is Associated with General Cognitive Function Post-Stroke

Elise Gjestad<sup>1,2</sup>, Anja Vaskinn<sup>3,4</sup>, Elisabeth Kliem<sup>1</sup>, Ingvild Saltvedt<sup>5,6</sup>, Ramune Grambaite<sup>1,2,7</sup>

<sup>1</sup>Department of Psychology, Norwegian Institute of Science and Technology, Trondheim, Norway; <sup>2</sup>Clinic of Medicine, St. Olavs Hospital, Trondheim University Hospital, Trondheim, Norway; <sup>3</sup>Centre for Research and Education in Forensic Psychiatry, Oslo University Hospital, Oslo, Norway; <sup>4</sup>Norwegian Centre for Mental Disorders Research, Institute of Clinical Medicine, University of Oslo, Oslo, Norway; <sup>5</sup>Department of Neuromedicine and Movement Science, Norwegian University of Science and Technology, Trondheim, Norway; <sup>6</sup>Department of Geriatrics, St. Olavs Hospital, Trondheim University Hospital, Trondheim, Norway; <sup>7</sup>Health Services Research Unit (HØKH), Akershus University Hospital, Lørenskog, Norway

## Objective

Social cognition encompasses the processing of information about other peoples' thoughts and emotions. The DSM-5 considers social cognition one of six domains where impairment may lead to the diagnosis of post-stroke neurocognitive disorder.

How potential impairments in social cognition presents in the stroke population has not yet been sufficiently described. The aim of this study was to examine the association between social cognition and general cognitive function post-stroke.



Figure 1. Example images demonstrating emotion recognition task (Paul Ekman Group, 2021).

## Methods

A subset of the patients participating in the longitudinal multicentre Norwegian Cognitive Impairment After Stroke Study (Nor-COAST) was approached to participate in an additional follow-up with social cognition tests three years post-stroke.

The study used the Mini-Mental State Examination (MMSE) as a measure of general cognitive function. Two tests were used to measure different aspects of social cognition: the Hinting Task and the Pictures of Facial Affect.

**The Hinting Task** (a test of theory of mind) presents the participant with scenarios where they have to infer the mental state of another person. **Pictures of Facial Affect** is a measure of emotion recognition, where the participant has to sort the presented photographs into one of six emotion categories.

Linear regression analysis was used to examine the association between general cognitive function and performance on the social cognition tests, controlling for age and sex.

## Results

29 patients (76% male, age=67.8, SD=10.5, education=13.8, SD=3.5, Modified Rankin Scale= 1.03, SD=1.0, MMSE=28.8, SD=1.2) were included. On average, patients correctly identified 74.9% (SD=12.2) of the facial expressions. For the Hinting Task, the mean score was 18.9/20 (SD=0.9).

A better performance on MMSE was significantly associated with better performance in emotion recognition. No significant association was found between MMSE and the theory of mind task ( $p>.05$ ).

Table 1. Association between general cognitive function and emotion recognition.

	B	SE	$\beta$	p	R <sup>2</sup>
					.30
Age	-.30	.21	-.26	.16	
Sex	-.47	4.87	-.02	.93	
MMSE	4.46	1.86	.42	.02	

## Conclusion

Our results support the hypothesis that there is a relationship between general cognitive function and ability to identify emotions in others three years post-stroke.

Impairments in this domain may impact rehabilitation and social relationships, and further exploration of this association is warranted.