Dement Neurocogn Disord. 2025 Jul;24(3):147-161
https://doi.org/10.12779/dnd.2025.24.3.147
pISSN 1738-1495·eISSN 2384-0757

DND Dementia and Neurocognitive Disorder

Review Article

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Social Cognition in Neurodegenerative Disorders

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OPEN ACCESS

Received: Jan 31, 2025
Revised: Jun 26, 2025
Accepted: Jun 29, 2025
Published online: Jul 7, 2025

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ABSTRACT

Social cognition, including theory of mind, empathy, social perception, and behavior, is crucial for interpersonal relationships and social functioning. Impairments in social cognition have also been recognized in neurodegenerative disorders including frontotemporal dementia, Alzheimer's disease, and Parkinson's disease. This review defines social cognition components, summarizes assessment tools, and evaluates their clinical applicability in these disorders. Despite research, the incorporation of social cognition assessments into clinical practice remains limited. Developing standardized, validated tools and integrating them with current, conventional neuropsychological assessments is crucial for improving the diagnosis, prognosis, and management of neurodegenerative disorders. Emerging interventions targeting specific social cognitive domains or their neural systems hold promise in enhancing the social functioning and quality of life of affected individuals.

Keywords: Social Cognition; Neurodegenerative Disorders; Theory of Mind; Empathy; Social Perception

INTRODUCTION

People live in constant social relationships. Social cognition refers to the ability to focus on, process, and interpret social cues to understand others. It involves processing information about oneself and others, as well as understanding social norms and procedures. Social cognition plays a crucial role in interpersonal relationships and helps individuals adapt their behavior to social contexts.[1] It encompasses a wide range of abilities, including emotion recognition, empathy, theory of mind (ToM) and self-awareness, moral reasoning, and attributional bias, and was previously studied primarily in the field of developmental

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Funding

This work was supported partly by the research grant funded by the Korean Dementia Association (2022-R001), and partly by the Technology Development Program for Startup Growth (RS-2023-00281898) funded by the Ministry of SMEs and Startups (MSS, Korea).

Conflict of Interest

The authors have no financial conflicts of interest.

Author Contributions

Conceptualization: Shim Y, Na S; Data curation: Shim Y; Resources: Shim Y; Supervision: Shim Y; Writing - original draft: Shim Y; Writing - review & editing: Shim Y, Na S, Yang SJ, Ryu HJ, Yoon B, Rhee HY, Jang JW, Jung YH, Chin J.

disabilities, particularly autism,[2] but has recently gained interest and research in the field of neurological conditions, including neurodegenerative diseases.

Social cognitive impairments, especially in the case of neurological disorders, can be expressed in a variety of clinical characteristics depending on which part of the brain they affect[3] and can be more severe than other cognitive disorders because they directly affect social relationships. However, existing research on social cognition in neurodegenerative disorders remains fragmented and underdeveloped. Many studies focus on isolated tasks or single diseases without offering an integrative perspective on domain-specific impairments or their neural correlates. Moreover, social cognition is often underrepresented in standard neuropsychological evaluations, despite increasing evidence that deficits in social cognition may precede other cognitive symptoms, contribute to caregiver burden, and compromise safety and social functioning in daily life.

Currently, clinical assessments such as the Seoul Neuropsychological Screening Battery, neuroimaging, and biomarkers play a central role in the diagnosis and monitoring of neurodegenerative diseases. However, these approaches may not fully capture interpersonal and behavioral changes that significantly impact patients' lives. In this context, social cognition assessments offer additional clinical value by identifying early or subtle symptoms, distinguishing between syndromes with overlapping cognitive profiles, and potentially enhancing prognostic predictions in terms of functional outcomes.

This review aimed to (1) define and structure the core components of social cognition, (2) summarize the currently available assessment tools across each domain, and (3) evaluate their clinical applicability and limitations in the context of neurodegenerative disorders. By doing so, we aim to bridge the gap between research findings and clinical utility and to propose how social cognition assessments can complement existing diagnostic and prognostic approaches. This review was conducted as a narrative literature review, with the aim of providing a clinically oriented synthesis of social cognition assessment tools in neurodegenerative disorders. Unlike a systematic review, this approach does not seek to exhaustively include all available studies but rather prioritizes those with demonstrated clinical utility, frequency of use in practice, and reported psychometric strengths. Tools and studies were selected based on their relevance to diagnostic differentiation, applicability to real-world clinical populations, and empirical support. Our intention was to bridge research and practice by highlighting assessments with translational potential, rather than providing a comprehensive methodological comparison across all instruments.

DEVELOPMENT OF SOCIAL COGNITION

Social cognition develops across the lifespan.[4,5] Early signs appear in infancy and childhood, such as social smiling by 6 weeks, emotion recognition through crying or smiling by a few months, and gaze-following and intention-reading by 9 months.[6] Children develop a ToM and understand that others' thoughts and beliefs may differ from their own.[7] According to Piaget, they gradually overcome egocentrism and learn to adopt others' perspectives.[8] Around age 4, children solve first false-belief tasks and learn social norms through role-play,[7] with second-order false-belief tasks developing by age 6–7.[9] During childhood[10] and adolescence,[11] social cognition becomes more complex through peer interactions, empathy development, and moral reasoning. Egocentric thinking such as the "imaginary audience" may reappear

in adolescence.[12] They consider friendships and social status, and develop the ability to adapt their behavior to social situations. In adulthood, perspective-taking and social judgment mature, although expression varies across cultures and environments. In older age, emotional regulation may improve, but social cognition can decline due to neurodegenerative diseases.[13] While executive functions and memory often decline, social judgment based on life experience may be preserved or even enhanced.

Overall, social cognition is shaped by environmental, educational, and cultural factors throughout life, and its decline in conditions such as dementia can significantly affect interpersonal functioning and quality of life.

TYPES OF SOCIAL COGNITION

Although there is still little consensus on the classification and structure of social cognition due to its diverse processes and the overlap between different concepts,[14] the main processes of social cognition can be schematically described in three stages: social perception, social understanding, and social decision-making (**Fig. 1**).[15] The ability to form appropriate social interactions involves several distinct processes. First, individuals engage in social perception, analyzing complex perceptual cues such as facial expressions, gestures, posture, body language, and vocal tone in order to recognize social situations and interpersonal dynamics.[16] This integrated information then serves as input for social understanding, a stage involving higher-order processes such as ToM and empathy.[17] Understanding why people act the way they do is important for making good decisions in social situations. We often make choices when interacting with others, either directly or indirectly, in complex environments. Our decisions depend on what others have already done or what we predict they will do. More generally, we also consider with the awareness of their consequences how these choices affect us and others. The outcomes of these processes, in turn, guide people to adapt their own social behavior accordingly.[18]

While these processes typically work together seamlessly in healthy individuals, disruptions can occur in various clinical conditions, leading to distinct patterns of social cognitive impairment. Clinically, social cognitive impairments usually appear to manifest in one or more of four ways: decreased social perception, impaired ToM, decreased emotional empathy, and abnormal social behavior.[3] Decreased social perception is characterized by difficulties in recognizing and responding to basic social and emotional cues. For example,

https://doi.org/10.12779/dnd.2025.24.3.147

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