Using Serious Games and Virtual Reality to Unlock Insights into Body Representations in Autism

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Background

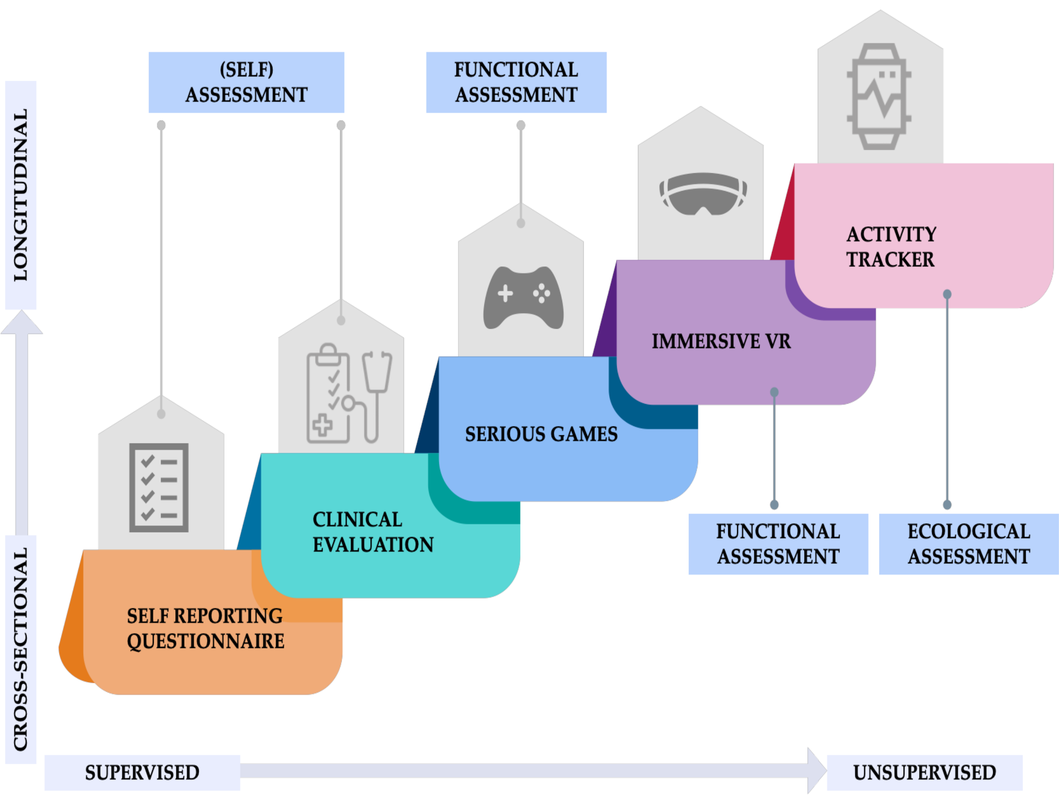
Autism Spectrum Disorder (ASD) presents atypical body representations

Traditional assessment tools fail to capture the dynamic and multifaceted aspects of body representations (BR) in individuals with ASD.

This study explores the integration of SG, VR and Smart watch technologies to evaluate BR in patients with ASD.

Multidimensional Assessment Pipeline

	Variables	Description	Type	Added Value
TRADITIONAL TOOLS	**Questionnaire**	Administered to evaluate self-representation and knowledge about BR, it includes standardized measures for body schema and image, and understanding the complex interplay of BR.	Self-Reported short sentences questionnaire	Accommodates attention span variability and neurodivergence-related difficulties; Utilizes randomized question sequence; Provides additional data through neuropsychological assessment
	Body Representation Assessment	Involves structured tasks and activities, clinical BR assessment by experienced therapists and psychologists in order to have a comprehensive assessment of motor skills, cognitive functioning, body image, and body schema	Clinical Assessment	Utilizes gold standard questionnaires; Provides holistic understanding of individual's body awareness
INTEGRATIVE APPROACH	**Serious Games**	Participants will be assessed in a clinical, non-supervised manner to understand their BR performances using different subtests, such as balance function, proprioception, visual-spatial ability, navigation skills, attention, motor coordination, gross motor skills, fine motor skills, stress relief, voluntary motor control, and BR.	STASISM	Offers engagement, customization, and real-time feedback; Utilizes advanced analytics for precise motion analysis; Incorporates wearable sensors for unsupervised daily mobility assessments
	Immersive VR	Gain insights into psychomotor profile and holistic understanding of abilities and needs by applying VR systems to assess BR in autistic individuals. Monitors upper limb mobility and physiological data.	PICO Neo3	Offers customization of environments; Provides ecological validity to simulated situations; Collects physiological data for deeper understanding; Analyzes autonomic measures through pupillometry and heart rate analysis
TECHNOLOGICAL	**Activity Tracker**	Uses smartwatches for unsupervised assessment of daily activities. Incorporates Ecological Momentary Assessment (EMA) in order to understand the impact of BR on daily living activities and gain insights into emotional states and habits	Garmin Vivosmart 5	Provides continuous monitoring of various parameters; Offers real-time insights into behavior and cognition; Aims to understand BR effects on needs and behaviors



Preliminary findings

1 **Engagement & compliance rates** ↗↗

2 **Accurate evaluation of BR discrepancies**

3 **Assessment of Self-recognition & spatial awareness**

Conclusion

The integration of SG and VR technologies offers a robust framework for evaluating BR in ASD.

These methods provide an ecologically valid and engaging alternative to traditional assessments, with the potential to enhance diagnostic precision and support personalized interventions.

