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# Research in Developmental Disabilities

journal homepage: [www.elsevier.com/locate/redevdis](http://www.elsevier.com/locate/redevdis)

## Understanding one's body and movements from the perspective of young adults with autism: A mixed-methods study

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### ARTICLE INFO

Number of completed reviews is 2

#### Keywords:

Autistic disorder  
Body image  
Movement  
Body-mind relation

### ABSTRACT

**Background:** There are but a few studies of how persons with autism perceive their bodies and movements. Difficulties in perceiving the surrounding world along with disturbed motor coordination and executive functions may affect physical and psychological development.

**Aims:** To explore the experiences of body and movements in young adults with autism and how two physiotherapeutic instruments may capture these experiences.

**Procedures:** Eleven young adults (16–22 years) with autism were interviewed and assessed using Bruininks-Oseretsky Test of Motor Proficiency (BOT2) and Body Awareness Scale Movement Quality and Experience (BAS MQ-E). Following a mixed-methods design, the interviews were deductively analyzed and conceptually integrated to the results of the two assessments.

**Results:** Experiencing conflicting feelings about their bodies/movements, led to low understanding of themselves. The assessments captured these experiences relatively well, presenting both movement quality and quantity. Positive experiences and better movement quality related to having access to more functional daily strategies.

**Conclusion:** Combining motor proficiency and body awareness assessments was optimal to understand the participants' experiences.

**Implications:** To capture body and movement functions in persons with autism in this standardized manner will lead to improved and reliable diagnoses, tailored interventions, increased body awareness and activity, and enhanced quality of life.

### What this paper adds

There is an apparent lack of knowledge regarding how young adults with autism experience body and movement. In previous papers on body and movement in autism, motor proficiency alone has been subject to examination. This paper adds to that knowledge, and investigates how these experiences and abilities are best examined with a combination of body awareness and motor proficiency instruments, in order to better understand and relevantly continue tailoring interventions.

Firstly, first-hand accounts of the experiences of body and movement from individuals with autism themselves are in focus. Secondly, the paper sets focus on the whole individual, analyzing and discussing how physical, physiological, psychological and existential dimensions interact with each other in individuals with autism in body-mind aspects. Thirdly, there are possibilities and

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<https://doi.org/10.1016/j.ridd.2018.05.002>

Received 22 September 2017; Received in revised form 27 April 2018; Accepted 3 May 2018

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resources in body and movement, which are also made obtainable for individuals with autism. The need to acknowledge this is important. Fourthly, the study shows how movement qualities, such as centering, flow or stability, as well as movement quantity, such as muscle strength or speed, are captured by the two instruments. This combination adds to the understanding of body and movements in persons with autism. Finally, the results of this paper give a broader and deeper understanding of the experiences young adults with autism have regarding their bodies and movement and what that means to them in their daily living.

## 1. Introduction

Children with autism grow up with different ways of experiencing and feeling compared to children without disability. It may be difficult for the former to understand that other people's feelings, thoughts, and intentions may differ from their own (theory of mind) (Ström, 2012). They may lack an understanding that behavior can originate from their own emotions and inner state (Rizzolatti & Sinigaglia, 2016), which are important for communicating and socializing with others. These problems may interfere with the ability to sense and understand one's body from within, which may manifest in how a person moves.

### 1.1. Concepts for understanding movement as an expression of our inner body

Motor activation resulting from watching other persons in action implies that motor areas can be activated by the process of *imitating* someone else's behavior, using mirror neurons in the brain (Rizzolatti & Sinigaglia, 2016). A mutual code for the representation of one's own body and the bodies of others may be found. It is plausible then that the information about one's body would be influenced by the perceptual representations of the body of another person, i.e., *perception–action coupling* (Blaesi & Wilson, 2010). If a movement is executed and becomes known to a person, the network structures in the brain become more developed. This association indicates that more experiences from movements enhances our perception–action flexibility and our learning to mentally represent and understand the world and the people around us (Rotem-Kohavi et al., 2014). To pursue known and meaningful actions, long-term memory is used to achieve a specific goal. If the meaning of the movement is unclear, a higher degree of attention will focus on the details of how to perform the movement (Wild, Poliakoff, Jerrison, & Gowen, 2012), needing *motor proficiency*, e.g., speed or precise balance. Having motor proficiency makes a person confident, which shows in the movements (Emck, Bosscher, Beek, & Doreleijers, 2009).

To learn to understand one's body is a complex process that comprises *body awareness*, the ability to be aware of one's body, which can be developed (Simons, Leitschuh, Raymaekers, & Vandenbussche, 2011). It can be awareness of emotions and sensations from within one's body, but also awareness about one's body from an external perspective (Hedlund, 2014). From this information, a deeper awareness, knowledge, and understanding about one's body and movement may be built. If sensory impressions are distorted, they may influence body awareness negatively (Simons et al., 2011).

Experiencing various sensory information, followed by multisensory integration, is vital for perceptual coherence and the process of creating a deeper meaning, the foundation of body awareness (Hedlund, 2014). Body awareness is a prerequisite to *bodily self-consciousness*, the ability to be conscious of oneself from bodily signals (Blanke, 2012). *Body ownership* and *agency* interact and influence both body awareness and bodily self-consciousness. *Body ownership* describes the ability to sense one's body and experience that it is differentiated from others' (Blanke, 2012). *Agency* refers to a person's ability to take action and describes the experiences of being the one who feels, chooses or acts (Asai, 2017). Hence, multisensory integration is essential to body ownership and agency, building the ability to differentiate between the self and others (Blanke, 2012).

### 1.2. Theories of body awareness and movement quality

In the theory of Basic Body Awareness Therapy (BBAT), bodily self-consciousness (previously termed body-ego functions in BBAT research (Gyllensten, Ekdahl, & Hansson, 1999) is expressed in abilities; conscious motor responses to solve a motor task, and behaviors; unconscious movement patterns, e.g., muscle tension (Gyllensten, 2012). According to BBAT, body functions consist of (a) relation to the surface/ground, (b) relation to the balance line, (c) maintaining flow, (d) being centered, (e) breathing, and (f) conscious awareness. In BBAT, four dimensions of existence are defined: (1) the physical (structural components), (2) the physiological (circulatory processes, breathing), (3) the psychological (feelings, thoughts, intentions), and (4) the existential (meaning, conscious awareness) (Gyllensten, 2012).

The expression of bodily self-consciousness appears in *movement quality*, how movements are executed in time and space, and the energy used. Good movement quality is experienced as unrestrained, being physically and mentally free (Skjaerven, Gard, & Kristoffersen, 2003).

### 1.3. Body awareness and autism

Movement quality affect quality of life and ability/inability to complete daily activities in persons with autism. Other people may find their stereotyped movement patterns disturbing. The attention required to master and guard one's behavior may negatively affect the mental capacity, and further lead to anxiety (Cesaroni & Garber, 1991).

Infants, later diagnosed with autism, may lack movement quality displayed as general movements (Einspieler et al., 2014). They have more impaired body awareness (Simons et al., 2011) and lower self-perceived motor competence than children without disability. This may increase the risk of further inactivity and impaired psychosocial and physical development (Emck et al., 2009),

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