



Review article

Distorted body representations in anorexia nervosa



Stephen Gadsby

Macquarie University, Sydney, NSW 2109, Australia

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ABSTRACT

In this paper, I discuss empirical evidence regarding anorexic patients' distorted body representations. I fit this evidence into a broader framework for understanding how the spatial content of the body is tracked and represented. This framework is motivated by O'Shaughnessy's (1980) long-term body image hypothesis. This hypothesis posits a representation that tracks changes in the spatial content of the body and supplies this content to other body representations. I argue that a similar kind of body representation might exist and, in the case of anorexia, be distorted. Finally, I suggest that this body representation might become distorted through influence by affect.

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E-mail address: Gadsby.st@gmail.com

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1. Introduction

Body representations can be defined (minimally) as internal cognitive structures that “function to track the state of the body and encode it, that can misrepresent it and that can be decoupled from it” (de Vignemont, 2016). Body representations are integral to many of our cognitive abilities. In order to perform different cognitive tasks, our brains must represent features of our bodies. In order to mentally picture what our body looks like, we rely on a representation of it in the form of a mental image. In order to reach towards and flick on a light switch, our brain relies on a representation of how long our arm is (de Vignemont, 2010, p. 672). In order to localise where a sound is coming from, our brain relies on a representation of the distance between our two ears and the shape of the pinna (the visible part of the ear) (Aslin, Pisoni, & Jusczyk, 1983; Clifton et al., 1988).

Representations of our bodies can determine how our bodies *feel* to us, how we *experience* them. Because of this, disorders in the way people experience their bodies allow us to better understand how the brain represents the body (Schilder, 1935). For example, in phantom limb disorder patients still feel the presence of a limb that has been amputated. Although they know they no longer have the limb, they can’t help but *feel* as if it’s still there. This experience can be explained with the hypothesis that their brain is still, somehow, representing the missing limb (Hilti & Brugger, 2010). Another example is xenomelia, whereby a limb is said to be *missing* from a patient’s body representation (Brang, McGeoch, & Ramachandran, 2008). This causes the patient to have an extreme desire to amputate the limb.

It’s been known for some time that anorexia nervosa (AN) patients also have a disturbed experience of their own bodies, specifically their body’s *size* or *shape* (DSM-III-R). Many claim that this experience arises as a result of distorted body representations (Gadsby, forthcoming; Keizer, Smeets, Postma, Van Elburg, & Dijkerman, 2014; Keizer et al., 2013; Spitoni et al., 2015). In this paper, I review the evidence on distorted body representations in AN. This evidence shows that patients exhibit distortions in three different kinds of body representations: the *body percept* (the mental image we have of our bodies), the *body schema* (used for motor control and simulation) and a representation I call the *tactile form* (used for certain kinds of tactile perception).

I then introduce a representational framework for understanding how spatial content on the body is stored and updated. This framework is based on work by O’Shaughnessy’s (1980), who claimed a representation (the ‘long-term body image’) tracks changes in the spatial content of the body and supplies this content to other body representations. I argue that a similar kind of body representation might exist, supplying spatial content to the body percept, body schema and tactile form. I then explain the evidence of distortion in patients’ body representations by suggesting it *arises* in their long-term body representations. Finally, I suggest distortion of this representation might occur through influence by affect.

2. Distorted body representations

2.1. The body percept

The first kind of distortion I will discuss affects one aspect of what is referred to as *the body image*. Gallagher and Cole write, “the body image consists of a complex set of intentional states—perceptions, mental representations, beliefs, and attitudes—in which the intentional object of such states is one’s own body” (1995, p. 371). Following Bruch (1962), AN patients are said to suffer from a *body image disturbance*.

It is generally recognised that there are two different components of the body image that are disturbed in AN: a mental image of the body and a collection of attitudes or feelings towards the body (Cash & Deagle, 1997, p. 108; Skrzypek, Wehmeier, & Remschmidt, 2001, p. 216). Although both these components are considered disturbed, the attitudes/feelings component of body image disturbance isn’t relevant to the current discussion. As such, I will only discuss the perceptual component of the body image, which I will refer to as *the body percept* (Gallagher, 2005, p. 25).¹ Following Bruch (1973) and Slade and Russell (1973) AN researchers have adopted Schilder’s definition of the body percept: “the picture of our own body which we form in our mind, that is to say the way in which the body appears to ourselves” (1935, p. 11; Smeets, 1997, p. 79).

Evidence that AN patients exhibit oversized body percepts comes from *body size estimate* (BSE) tasks. These involve a variety of different methods such as modifying distance between light points on a wall to match the width of one’s body part, drawing one’s body size on a wall or selecting a silhouette that best matches one’s body size (Gardner, 2011; Skrzypek et al., 2001). While there has been a good deal of disagreement in the past regarding the reliability of the different BSE methods,

¹ Gallagher uses the term ‘body percept’ to refer to a broad category of perceptual experiences of the body. Instead I am using this term as a shortened version for what AN researchers call ‘the perceptual component of the body image’. This refers to a specific body representation, rather than a group of kinds of experiences.

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