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BODY SIZE PERCEPTION IN ANOREXIA NERVOSA: A SIGNAL DETECTION APPROACH

MONIQUE A. M. SMEETS, J. DAVID INGLEBY, HANS W. HOEK
and GEERT E. M. PANHUYSEN

Abstract—This study investigated whether individuals with anorexia nervosa (AN) visualize themselves as fatter than they are because they *perceive* themselves as fatter. Females with AN who overestimated their own body size judged size differences between pictures of their own body, and then again of someone else's body. Signal detection analysis of the results showed no differences in perceptual sensitivity between the AN and normal and thin control groups. No significant correlations were found between body size estimates and perceptual sensitivity. The anorexic group did, however, show a bias to report seeing “thin” differences, which was opposite to that of thin controls. Because bias differences between the groups were significant while sensitivity differences were not, it was concluded that abnormalities of body image most probably arise during reconstruction of the visual body image, rather than during perception of the body. © 1999 Elsevier Science Inc.

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INTRODUCTION

A phenomenon that has not received much attention in recent scientific literature is *body image disturbance* in anorexia nervosa (AN). This disturbance is characterized by feeling and judging oneself as fat and by claiming to “see” oneself as fat, despite the fact that one is underweight, and it is one of the diagnostic criteria for AN in the DSM-III, -III-R, and -IV [1–3].

The reason for the waning popularity of this topic may lie in the methods that have generally been used to investigate it. Research into body image disturbance has long been dominated by the body size estimation (BSE) paradigm. In BSE, participants manipulate the distance between movable markers or the size of a video image of a female figure until they believe it matches their own body width or size. An important problem is the obscurity of its theoretical foundations and implications [4–6]. The present study aims to provide an interpretation of findings obtained with BSE experiments to clarify the nature of the body image disturbance.

A statistical meta-analysis summarizing the results from 33 BSE experiments comparing anorexic patients to control participants, after controlling for methodological differences, demonstrated average overestimation of body size by the AN group [7]. Because participants estimated their body sizes during BSE without any

Department of Psychonomics, Utrecht University, Utrecht, The Netherlands.
Address correspondence to: Monique Smeets, Ph.D., Monell Chemical Senses Center, 3500 Market Street, Philadelphia, PA 19104. Phone: (215)-573-7965; E-mail: smeets@monell.org

visual reference to their bodies it was concluded that, to be able to judge their body size, they will most likely have consulted a visual, mental image of their own body. (For a more extensive investigation of this argument see Smeets [8].) Hence, if individuals with AN overestimate their body sizes, and if the BSE task taps into the visual mental image of one's own body, then the image of their body must be *fatter* than the body actually is.

The next important question concerns how—according to what mechanism—this visual image became enlarged? Two explanations will be considered. According to the first, a disturbance of body image implies a disturbance of visual *perception*. The body is imaged as fatter because it was originally perceived as fatter. Here, the assumption—often made implicitly—is that imagery is equivalent to retrieving a previously perceived visual pattern from visual memory (a bottom-up approach).

According to the second explanation, the disturbance occurs at the stage of *imagery*. Because she thinks she is fat, the individual with AN (most often a female) constructs a visual image of herself as fat (a top-down approach). In recent theories of visual imagery, such as that of Kosslyn [9, 10], visual imagery is regarded as a process that involves not only visual representations, but also propositional (language-like, not visual) representations. So, every time an image is generated, it is *reconstructed* from memory, a process in which associated thoughts (or feelings) may affect the resulting image. For example, Finke [11] reported an experiment in which labeling the same pattern as “eye glasses” or “dumbbells” resulted in different reproductions on a later occasion. The patterns previously stored with the label “eye glasses” comprised more details characteristic of eye glasses than the original pattern. The same was true for the reproductions associated with the term “dumbbells.” We can imagine that this is what happens when people who have AN visualize their own bodies: the thought that one is fat “blows up” the image, even bringing with it details such as fat-rolls and a big belly.

The notion that body size overestimation reflects body related attitudes rather than “perceptual” disturbances has gradually gained in popularity (e.g., refs. 12–14). Likewise, researchers are increasingly inclined to believe that the disturbance originates at the level of *reconstruction* of the visual pattern during imagery, rather than at the level of *registration* of the visual pattern in a visuospatial medium during perception. However, testing this hypothesis can be problematic. Studies showing significant correlations between body-related attitudes and body size estimates, although interesting in their own right, do not necessarily disprove the “perception” explanation; that is, demonstrating that the image is “fatter” upon reconstruction and correlated with body attitude, does not rule out the possibility that it was perceived (or encoded) inaccurately. So, even though interest seems to be shifting toward the influence of “fat attitudes” on the body image, we clearly cannot ignore the issue of how the body was perceived. Only if we can show perceptual disturbances to be absent or of relatively minor significance, can we move on to further explore the issue of disturbances of imagery.

Thus, the present study was designed to explore the issue of body size *perception*, comparing females with AN to controls. To assess body size perception, we used a method that is generally applied in the field of (classical) psychophysics, the method of constant stimuli. The participants were shown an undistorted picture of their own body on a computer, which was used as the reference (the *standard* stimulus). A se-

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