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# The Psychological Structure of Corporeality

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In the article, the authors continued to develop the concept of corporeality as the higher psychological function, and presented an original model of the psychological structure of corporeality, developed on the basis of a cultural-historical and phenomenological approaches. The need to create such a model is due to the ambiguity of horizontal connections and hierarchical relationships between various bodily phenomena. As the higher psychological function, corporeality should have an appropriate level structure within which it would be possible to qualify bodily phenomena. In the psychological structure of corporeality, we have identified the following components: the body image, the phenomena of body ownership and body agency, bodily functions. To distinguish these elements as separate taxonomic units, we turned to the results of empirical studies that use the clinical principle of double dissociation.

***Keywords:*** body, corporeality, body image, body schema, higher psychological functions.

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# Психологическая структура телесности

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В статье авторы продолжили разработку концепции телесности как высшей психической функции и представили оригинальную модель психологической структуры телесности, разработанную на основе культурно-исторического и феноменологического подходов. Необходимость создания подобной модели обусловлена неясностью горизонтальных связей и иерархических соотношений между различными телесными феноменами. Как высшая психическая функция, телесность должна обладать соответствующей уровневой структурой, в рамках которой было бы возможно квалифицировать телесные явления. В психологической структуре телесности мы выявили следующие компоненты: образ тела, феномены владения и управления телом, телесные функции. Для выделения

названных элементов в таксономические единицы мы обратились к результатам эмпирических исследований, в которых используется клинический принцип двойной диссоциации.

***Ключевые слова:*** тело, телесность, образ тела, схема тела, высшие психические функции.

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## Introduction

Corporeality presents a unique problem in psychology. Alexander Tkhostov [12] notes that psychology, while formally recognizing the psychosomatic integrity of a person, is more concerned with the study of consciousness and cognitive processes. However, corporeality in the development of a person over their lifetime acts as "...the very first object of mastery and transformation into a universal tool and sign" [12, p. 6] Maurice Merleau-Ponty [6] also argues that the earliest form of self-awareness is rooted in a person's bodily experience. Self-awareness, according to the French phenomenologist, presupposes being in the world through one's own living body. This view is shared by a number of researchers who have studied bodily self-awareness in infants [29; 30]. Nevertheless, Karl Jaspers considered attempts to form a general principle in the relationship between the psychic and the somatic to be futile, since they lead either to dualism, that is, to the recognition of psychophysical parallelism, or to monistic materialism, where the psychic is considered as a transient property of the somatic substrate, or else to spiritualism, which postulates the exact opposite [14]. Holism, to all intents and purposes, is the same extreme. One might agree with Jaspers that for the purposes of empirical research it is only important that the body affects the psyche, and the psyche affects the body [14, p. 832]. Perhaps taking such a position is like cutting the Gordian knot, but we would like to discuss here not the philosophy of the relationship between soul and body, but rather the psychological structure of corporeality, since this problem is important for the very issue of psychosomatic unity, and for a more accurate qualification of bodily phenomena in conducting research and solving the practical diagnostic and therapeutic tasks which clinicians face.

In the Russian psychology of corporeality, Valentina Nikolaeva and Galina Arina posited the concept of the body as a "...hierarchically organized quasi-system with various levels of regulation and dysregulation" [9, p. 125]. This position assumes that bodily phenomena have features of higher psychological functions, that is, they are social in origin, mediated and systemic in psychological structure, arbitrary in their way of implementation, and that they have elementary and higher components. The authors demonstrated that the bodily functions of respiration, digestion, pain response, and so on are transformed in the process of mastering symbolic forms of regulation. The hierarchical organization of corporeality is reflected in the concept of the internal picture of disease, where Nikolaeva identifies the level of perceptual sensations (sensory), affective response (emotional), cognitive representations (intellectual), and the motivational level associated with the attitude to one's condition [8]. Similarly, Tkhostov and Arina highlight in their model sensual material, which is represented by hard-to-distinguish unpleasant sensations; the primary meaning of these sensations is in the categories of modality, localization, and intensity; the secondary meaning, which includes sensations in the concept of illness, passing them through the filter of cultural representations; and, finally, the personal meaning of illness as the influence of the disease on the motives of the subject's activity [13]. The phenomenon of illness is of particular importance for the psychology of corporeality, since disease is often associated with unpleasant interoceptive sensations, through which the body manifests itself in the life of each of us [12].

It remains unclear what corporeality itself is. It can be said that in general it represents a spectrum of interrelated phenomena that arise at the intersection of the somatic and the mental. Following the definition of Vladimir Zinchenko [5, p. 168], corporeality means the space between the "incarnated" soul and the "animated" body, which equally applies to both. The problem that the model presented below is designed to help solve is the lack of clarity regarding the horizontal and vertical connections between the many phenomena that arise in the space between the body and the psyche. In addition to the attitude to corporeality itself, what is the relationship between movements, interoceptive sensations, breathing, scientific and folklore-based ideas about the body, posture, the sense of belonging to one's own actions, the implicit knowledge of the length of one's limbs, and the emotional attitude to the body? At first glance, these phenomena twinkle randomly in the realm of the psychosomatic. However, based on the patterns between them, it is possible to identify the components that form the psychological structure of corporeality, namely: body image; the phenomena of body agency and body ownership; and bodily functions. Body image and bodily functions (body schema, respiration, digestion, blood circulation, pain response, etc.) are, from a general standpoint, the highest and most elementary compo-

nents of corporeality respectively. The basis for distinguishing body ownership and body agency is their end-to-end nature in relation to all bodily phenomena. Below we will discuss in more detail each of these components which make up the structure of corporeality.

## Body Schema and Body Image

These concepts remain the subject of great terminological confusion, they are often used interchangeably or components of one are attributed to the other, so it is necessary to discuss what body schema (BS) and body image (BI) are, and how they relate, since solving this problem opens the way to a more accurate qualification of bodily phenomena.

Shaun Gallagher was the first to draw a distinction between these concepts in theoretical terms. He defined body schema as "...pre-noetic (automatic) system of processes that constantly regulates posture and movement — a system of sensory-motor capacities and actualities that function without the necessity of perceptual monitoring" [24, p. 149]. It should be immediately clarified here that the pre-noetic specificity of BS signifies its ontogenetic primacy in relation to conceptual structures and the implicitness of functioning. In terms of cognitive processes, as a "prenoetic sensorimotor pattern", BS is located between concept and sensuality [2]. According to Gallagher's definition, multisensory integration, visual-proprioceptive coordination, and the execution of movements should be attributed to BS [18].

As to body image, Gallagher gave the following definition: "...an intentional content of consciousness that consists of a system of perceptions, attitudes, and beliefs pertaining to one's own body" [24, p. 149]. BI, according to Gallagher and the authors who completed his model, consists of at least three components: 1) the perceptual bodily experience of the subject; 2) general conceptual (mythological or scientific) ideas about the body that a person has; 3) attitudes to the body, including cognitive, affective and behavioral links [24; 31].

The following criteria served as the basis for the separation of BS from BI: 1) presence in consciousness; 2) integrity/separateness; 3) connection with the environment [24]. In the first criterion, we are talking about distinguishing between non-conscious bodily functioning (BS) and the conscious awareness of one's body (BI) [16]. Furthermore, BS is characterized by integrity, whereas for BI it is peculiar to "dissect" the body, to isolate its individual parts, localizing sensations. Finally, BS exists relative to the environment, it has to reckon with objects in space, whereas BI involves distraction from the environment, focusing on the body within its boundaries. For clarity, let's use an illustration by Gallagher [24, p. 151]. When a person reading a text experiences visual tension, it manifests itself as changes in the objects of interaction (the light is too weak, the font is too small, the text is tedious and complex). It takes time for the eyes, "sewn" into BS and working with it as a whole, to be isolated from its "pre-noetic anonymity". Only after a person has noticed their fatigue do the eyes as a separate part of the body and the sensations associated with them cease to be objectified in the environment, and become owned by that person.

It should also be noted, that if BS combines automatic ascending sensory and executive processes, then BI consists of descending representations of a higher order [27]. The latter are lexical and semantic in nature, and are responsible for the organization of body parts, bodily functions, interoceptive sensations, and the relationship between the body and external objects. From the point of view of the semiotic scheme, BI is the structure responsible for the primary and secondary development of bodily phenomena. At the level of BI, we can record the interaction of the subjective lived experience and the objective physical body.

It is necessary to highlight the empirical grounds for separating BS and BI into different taxonomic units. This is possible due to the clinical principle of double dissociation, the essence of which is that if one function is impaired and the other remains intact and vice versa, then these functions are sufficiently independent of each other to be considered separately, without excluding their interaction [21; 31].

Moving forward, we are faced with the question of the interaction of BI and BS, which is discussed in detail by Victor Pitron et al [28]. Do they influence each other? Are the interactions between them systematic and reciprocal? The first problem to be faced in answering these questions is the plasticity of these phenomena, since influence implies the possibility of change.

There are both short-term and long-term bodily sensorimotor phenomena [28]. The first include, primarily, movements, pose, posture and gait, that is, the dynamic position of the body relative to environmental objects presented in a changing environment, and the position of body parts relative to each other. The second is the mental reflection of body parts and their size. In the vast majority of cases, movements, posture and gait are executed by BS. The carrier of stable bodily phenomena is BI [22; 23]. The question of plasticity is most interesting precisely in relation to long-term stable phenomena, since posture, gait and movements imply high variability. It seems that if the size and number of body parts do not change significantly and quickly during a person's lifetime, then the plasticity of the long-term BI is low. However, the use of tools can serve as an example of the opposite. This is best reflected in the phenomenon of the "probe": using a probe represented by a tool when interacting with an object, a person localizes sensations at the boundary between the probe and the object, not between a part of the body and the probe [10]. For ex-

ample, when a cloakroom attendant uses a clothes puller, they not only move their arm as if it were longer, but also perceive it as such. In studies of bodily illusions, it has been shown that the subjects' perception of the center of their hand shifts after using a special stick [26]. As such, the instrument is not only "captured" by the body in the executive-motor act, but also incorporated into the body perceptually, affecting both BS and BI. However, the phenomenon of the probe is limited by the autonomy of the object. As soon as the latter shows resistance, it obtains independence and leaves the possession of the subject. If the clothes puller from the example above is moved by someone else besides the cloakroom attendant, then the localization of sensations will return to the probe/hand boundary. Relatively stable bodily representations can also change in the absence of a tool. For example, when exposed to vibration on the biceps tendons, test subjects felt that the arm was moving away from the body, and touching the nose led to its perception as longer (also in virtual reality) [19]. If we assume that the body, which is completely subordinate to the subject, also acts as a "universal probe", then in a situation of influence from the non-self, the body loses full control, and the boundary of perception shifts. In this context, the thesis of the need to replace the binary subject—object division with a triadic subject—body—object is confirmed [10, p. 17]. Based on this, we can propose the following interpretation of the phenomena under consideration: body schema is the implicit body of the subject when interacting with an object, and body image is the body of the subject in a situation of interaction with the body itself as an object, but a special object, because it is also a mediator between the subject and the environment, the objective world.

Since BI and BS have the potential to change, it is necessary to establish how and to what extent they affect each other. Most often, they are congruent in terms of content, which ensures unhindered daily functioning. Nevertheless, BI and BS are forced to be rebuilt when the discrepancy between them (a) endures such that a tolerance can be maintained to it [28], and, as we consider it necessary to add, (b) has significant consequences for the daily functioning of the individual. The duration of the mismatch and the significance of its consequences differ from case to case. For example, the gap between BS and BI increases in situations where the result of a bodily operation significantly diverges from the original program of action, and BI is called upon through perceptual monitoring to correct the "failures" of BS. For example, when a novice basketball player does not have an automated skill that allows him to make accurate throws, and he misses when attempting to throw ball into the basket, he has to stop and envision, following the verbal or visual instructions of the coach, how his body, with all its parameters under established environmental conditions, produces a certain sequence of motor acts leading to the desired result, so that later, with a great chance of success, he can literally embody these movements. If this example shows the effect of BI upon BS, then to see the opposite effect, you can refer to the experiments mentioned involving the creation of bodily illusions, where by influencing sensorimotor processes, i.e. BS, researchers caused changes in bodily perception, i.e. BI.

The above is enough to show the difference between BS and BI, and to outline the patterns of their interaction in general. In the psychological structure of corporeality, if we proceed from Lev Vygotsky's thesis that "the higher function is the mastery of the lower" [Cit.: 4, p, 140], BI acts as the higher level of corporeality. BS, being limited by sensorimotor processes, acts for BI only as one of the agents of interaction along with other bodily functions. Based on the research of Tkhostov, one can look at BI as a product of the cultural transformation of primary bodily phenomena, which the author calls "transformed" corporeality: "Transforming into a cultural object, it doubles the form of its existence: in addition to realizing its natural essence, corporeality becomes a signifier within the widest limits, and begins to be built not only on natural patterns" [12, p. 176]. Moreover, while most animals have a BS, then only humans have a BI with all the listed components [28], although its presence in a less differentiated form has been confirmed in chimpanzees [25].

## Body Ownership and Body Agency

In phenomenology, following Edmund Husserl and Helmuth Plessner, it is customary to distinguish between the lived subjective body (Leib) in the meaning of being a body (Leibsein) and the physical objective body (Körper) in the meaning of having a body (Körperhaben) [33]. The subjective lived body acts as a carrier of primary self-awareness, which is devoid of self-objectification and conceptuality. This most ontogenetically early and ontologically fundamental form of self-awareness is determined by 1) the feeling that a person is the one who lives the experience (self-ownership), and 2) the feeling that the subject is the initiator of their own actions (self-agency) [15]. In ontogenesis, higher-order representations are added to the prereflexive pre-conceptual components of corporeality, which again brings us back to the idea of corporeality as the higher psychological function.

This interrelation of ontogenetically earlier feelings of living experience and initiating actions with later conceptual structures is reflected in the phenomena of body ownership and body agency, where a sensual and conceptual component is distinguished in each. In this way, body ownership, according to a study by Aviya David and Yochai Ataria [20], is divided into a judgment of

body ownership (knowing) and a sense of body ownership (feeling). According to the authors, being fixed in sensory and executive processes, the implicit and diffuse sense of body ownership refers to BS, whereas the judgment of body ownership is explicit, based on conceptual (scientific or mythological) ideas about the body and the knowledge-based interpretation of bodily experiences, and therefore is included in the structure of BI.

Body agency reflects the connection between the intentions and actions of the subject. In body agency, the authors also distinguish between the sense and the judgment of body agency. The sense of body agency, as well as the sense of body ownership, is pre-reflexive and implicit, therefore researchers attribute this phenomenon to BS. The judgment of body agency is explicit and conceptual, and therefore refers to BI. BI presupposes abstraction of the body, that is, an allocentric perspective: looking at themselves "from the outside", a person understands the causal conditionality of their actions, interpreting them as their own.

The principle of double dissociation makes it possible to taxonomically separate body ownership and body agency. Manos Tsakiris, Matthew Longo and Patrick Haggard [32] associate the sense of body ownership with afferent links and multisensory integration, and the sense of body agency with efferent links. Deafferentation studies show the difference between the organization of these phenomena in the brain. Moreover, such a separation corresponds to the model of interacting cognitive subsystems (ICS), according to which intero-, proprio- and exteroceptive stimuli are encoded in propositional and implicative ways. The propositional subsystem contains cognitions (thoughts and images) that can be expressed using linguistic means ("I know that..."), whereas the implicative subsystem is responsible for processing hard-to-interpret affects and sensations ("I feel that...") [17].

Despite the fact that judgment of body ownership and body agency refers to BI, and the sense of body ownership and body agency refers to BS, we consider the phenomena of body ownership and body agency as independent units, since they do not entirely relate to BS and BI, but rather permeate them. Since we consider BS as one of the bodily functions, we assume that the sense of body ownership and body agency can be attributed to a number of other bodily functions: expressive innervations, breathing, urination and defecation, sexual function, and pain response.

## Bodily Functions

As Valentina Nikolaeva and Galina Arina write [9], in the course of psychosomatic development, a person learns sign-symbolic forms of regulation, which significantly alter their naturally given needs and bodily functions. BI, judgment of body ownership, and agency as a symbolic form of regulation of bodily activity are formed, in accordance with the general genetic law of cultural development [3; 7], in the process of interiorization, and represent the final product of this process. At the first, interpsychic level of interiorization, in the course of joint activity with an adult, a child learns a system of perceptions, attitudes, beliefs and behaviors related to the body, which is what constitutes BI. The child also receives at this stage the knowledge that their body belongs to them and that they control it (judgment of body ownership and body agency). In the subsequent extra- and intrapsychic levels, the child treats bodily experiences in accordance with the content of BI. As for the sense of body ownership and agency, they evolve at an earlier ontogenetic stage along with BS.

In this piece we have examined in sufficient detail the interaction of BI as a regulatory tool and BS as a bodily function. In addition to BS, i.e. motor activity and orientation in an actual spatial setting, biologically determined bodily functions include mimic and pantomimic expression, breathing, urination and defecation, sexual function, digestion, pain and galvanic skin reaction, blood circulation and sweating. A person is able to influence these bodily functions indirectly, through emotional regulation. To illustrate the connection between biologically determined bodily functions and emotional phenomena, it can be noted that during laughter, when a person experiences joy, spasmodic contractions of the diaphragm and facial muscles occur, while anger, for instance, is accompanied by a slowdown in the activity of the gastrointestinal system, and an increase in blood pressure and in heart rate [1]. The degree of awareness, arbitrariness, of mediation by speech, of elaboration of emotion—object connections, determines the controllability of the accompanying expressive innervations and vegetative reactions [11]. Thus, in affects characterized by involuntariness and objectlessness, vegetative manifestations are uncontrollable, but a holistic mature emotion, object-directed and accessible to mediated regulation, opens up the possibility of limited control of its somatic components.

## Conclusion

We have examined corporeality as a higher psychological function, in the psychological structure of which body image, the phenomena of body ownership and body agency, as well as bodily functions are distinguished. Body image is the "intentional content of consciousness", which consists of 1) the perceptual bodily experience of the subject; 2) general conceptual (mythological or scientific) ideas about the body that a person has; 3) attitudes to the body, including cognitive, affective and behavioral links. Body ownership and body

agency are cross—cutting bodily phenomena related to body image and bodily functions, and have a two-level structure: implicit diffuse feeling and explicit conceptual knowledge. Bodily functions, transformed through sign-symbolic reflection and regulation, are represented by mimic and pantomimic expression, sensorimotor processes and orientation in an actual spatial environment (body schema), breathing, urination and defecation, digestion, pain and galvanic skin reaction, sexual function, blood circulation, and sweating. The proposed concept of the psychological structure of corporeality as a higher psychological function is designed to facilitate a more accurate qualification and categorization of bodily phenomena, which requires further empirical research.

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