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Cognitive A Priori and Amodal Perception in the Focus of Experimental Philosophy

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Когнитивные a priori и амодальное восприятие в фокусе экспериментальной философии

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Abstract. The article discusses the prospects of neurophenomenology as a substantiative theory with respect to the results of neurocognitive research. Some relevant ideas and theoretical findings of the phenomenology of Edmund Husserl, which are of great importance for the interpretation of experimental data from neuroscience, are consistently presented and analyzed. In particular, the emphasis is made on the procedure of analogizing apperception (appresentation), based on an even deeper pairing mechanism. In so doing, I consider and trace the evolution of these ideas in Husserl's works of different years and periods. As an example, that clearly demonstrates the universal *a priori* rock-bottom role of appresentation in cognition and perception, the procedure of amodal completion is chosen. Amodal completion is the process of perception by which an object is apprehended as a whole while some parts of it are occluded by other objects. These research seems to open up wide opportunities for neurophenomenology as the theoretical basis of the sciences of consciousness, mind and brain.

Keywords: *analogizing apperception; appresentation; neurophenomenology; amodal completion; cognitive neuroscience*

Аннотация. В статье рассматриваются перспективы нейрофеноменологии как обосновывающей теории по отношению к результатам нейрокогнитивных исследований.

Последовательно представлены и проанализированы некоторые актуальные идеи и теоретические выводы феноменологии Эдмунда Гуссерля, которые имеют большое значение для интерпретации экспериментальных данных нейронаук. В частности, акцент делается на процедуре аналогизирующей апперцепции (аппрезентации), основанной на еще более глубоком механизме удвоения. Прослеживается эволюция этих идей в работах Гуссерля разных лет и периодов. В качестве примера, который наглядно демонстрирует универсальную априорную роль аппрезентации в познании и восприятии, выбрана процедура амодального завершения. Амодальное завершение — это процесс восприятия, посредством которого объект воспринимается как единое целое, в то время как некоторые его части скрыты другими объектами. Представляется, что исследования в этом направлении открывают широкие возможности для рассмотрения нейрофеноменологии как теоретической основы наук о сознании, разуме и мозге.

Ключевые слова: *аналогизирующая апперцепция; аппрезентация; нейрофеноменология; амодальное завершение; когнитивные нейронауки*

Introduction

The cognitive turn we are witnessing in science these days resulted from rapidly developing empirical brain-and-mind research and likewise active development of consciousness studies. Consciousness, by virtue of its specificity, turned out to be the object of both natural science and humanitarian speculative knowledge. Having established the interdependence of the brain and its neurostructures with the phenomena of consciousness available in acts of reflection, it would seem that we should clearly realize the productivity of the interpenetration of philosophy and the empirical Sciences studing cognitive experience. Deep conceptual relationship of philosophy with cognitive and neuroscience has manifested itself in Gestalt and phenomenological psychology (K. Koffka, F. Perls), neurophenomenology and enactivism (E. Roche, E. Thompson, F. Varela), embodied simulation theory (V. Gallese), etc. Increasingly, scientists involved in empirical research in various academic fields, turn to metaphysics, andaddress the issues of foundations for cognition and knowledge, consciousness and morality, thought and language. A. Dama sio, H. Maturana, S. Pinker, F. Varella, F. de Waal, A. Wierzbicka and hundreds of other researchers in their books raise questions that with equal facility can fall into the realm of modern biology, psychology, psycholinguistics and other sciences, as well as be directly subsumed under the general heading of "philosophy."

Numerous attempts of scientists to get out of the narrow professional boundaries into an interdisciplinary philosophical space clearly demonstrate that within the scientific community the request for serious theoretical and philosophical thought emerges full blown. At the same time, the crisis that L. Vygotsky spoke about, referring to the methodological opposition of natural science and humanities, remains a live issue today. The rigid distinction of real-ideal as a theoretical and cognitive premise accepted by a number of philosophers and scientists who study consciousness makes many of them still quite skeptical

about the convergence of philosophy and experimental sciences. In the natural science community, they often do not realize the need to turn to philosophy, without which it is unlikely that the theoretical design of the huge array of experimental data, which, according to literature, is rapidly increasing in size, is possible. Meanwhile the phrase "experimental philosophy" also causes skepticism among some philosophers, in particular philosophers of mind who practice it in the analytical tradition.

The main goal of this paper is to demonstrate how research in the field of cognitive neuroscience can be philosophically understood and interpreted. It seems that this understanding can and should play at least a double role. On the one hand, it will allow to organize and systematize numerous, often disparate results of empirical research. On the other hand, the neurophilosophical interpretation of a variety of cognitive procedures has a serious heuristic potential and can lead to the generation of new original hypotheses, the empirical verification of which in turn will require a new design of experiments.

In this article, by the example of neurophenomenological interpretation of amodal completion, I will demonstrate the grounding role of the embedded and embodied cognitive mechanism of an analogizing apperception in understanding, at first glance, completely different cognitive procedures: from typing and categorization to reasoning and learning models. A detailed study of apperception (appresentation) was carried out by the philosopher, founder of phenomenology Edmund Husserl.

In section Husserlian Phenomenology and Cognitive Science, a kind of philosophical introduction to the problem will be presented. That way I will try to characterize the most important aspects of Husserl's phenomenology, which, in my opinion, makes it the most preferable candidate for both the philosophical study of consciousness (as a philosophy of consciousness) and the methodological interpretation of experimental research of neural correlates of consciousness. Section Analogizing Appresension as a Basis for Amodal Completion is devoted, firstly, to the direct consideration of analogizing apperception, and secondly, to establishing the connection of this mechanism with amodal perception. The final part summarizes the results of the study undertaken and outlines the prospects for future work.

Husserlian Phenomenology and Cognitive Science

The methodological opposition of humanities and natural science knowledge mentioned in the Introduction continues to in philosophy takes the form of peculiar phobias of psychologism and physicalism. The term *psychologism* is still perceived by many philosophers of analytic thraditions and logicians only in a negative connotation, as an attempt to reduce the ideal content of consciousness to empirical temporal objects, their relationships and structures. That way, they consider anti-psychologism as the only alternative to psychologism, where the letter for some of them obtains the features of an *innate idea*.

It is well-known that anti-psychologism appeared at the turn of XXth century as a reaction to the psychologization of logic and apodictic knowledge in general. The founder

of phenomenology, E. Husserl, whose work has yet to be appreciated at its true value by the cognitive science of the XXIst century, in *Logical Investigations* (1970) subjected psychology in logic to a comprehensive and severe criticism, considering that the subject-matter of logic is objective ideal semantic connections, and not the process of their empirical formation. Criticism of psychologism in logic was absolutely fair and timely on the cusp of the XIXth and XXth centuries, because it allowed to outline the subject field of logic as a scientific discipline in its own right, independent of psychology, as well as to determine the vector of its further development. Husserl in his criticizm of psychologism, which calls into question the objectivity and a priori of logical laws, sought to defend the objective status of scientific theoretical knowledge. Any theory that claims to be scientific was considered by him from the side of unity of sense, grounded in logic. From this perspective, every science as a system of knowledge was considered as applied logic. With this in mind, it becomes clear that the relativization of logical laws automatically led to relativization of apodictic theoretical knowledge, especially mathematical knowledge, which was completely unacceptable for Husserl.

Speaking about anti-psychologism nowadays, it is important to understand what restrictions Husserl himself imposed on it, and which we should keep in mind when talking about psychologization, or naturalization. Husserl's anti-psychologism concerned the field of pure logic, because logic is not about who makes science and how, rather it investigates what makes science a science. In other words, anti-psychologism had to do with scientific knowledge, which was considered from the side of its sense content, without taking into account issues related to its genesis. Husserl believed that the areas of pure logic and methodology should not be confused. Psychologism cannot be accepted in pure logic, while in methodology, it is possible and even necessary to allow both the psychologicality and the logicality. Husserl focuses on the construction of phenomenology as purely descriptive method of research of consciousness. The vector of his research program is directed not so much towards logic as towards cognitive science and artificial intelligence. Dreyfus brothers were right when they identified Husserl as the father of the information-processing model of the mind and artificial intelligence (Dreyfus H. L., Dreyfus S. E., & Athanasiou, 2000).

In his criticism of psychologism, Husserl supported his senior colleague, the logician and mathematician G. Frege, who laid the foundation of modern symbolic logic. Husserl's phenomenology may well be called an attempt to clarify the definitions of meaning given, but not disclosed, by his senior colleague Frege. I mean defining meaning as a way of specifying an object. The founder of phenomenology makes a grand attempt to comprehensively study consciousness as a way of constituting the objective world, which will eventually lead him to understand the a priori grounds that allow us to consider the world as originally cognitively determined or predestined. In this case, for Husserl, predestination did not mean that the world first appears through knowledge, but that the cognitive acts performed in relation to individual objects of experience are directed to completely indeterminate substrates.

> For us the world is always a world in which cognition in the most diverse ways has already done its work. Thus, it is not open to doubt that there is no experience, in the simple and primary sense of an experience of things, which, grasping a thing for the first time and bringing cognition to bear on it, does not already "know" more about the thing than is in this cognition alone […]. This preknowledge is indeterminate as to content, or not completely determined, but it is never completely empty; and were it not already manifest, the experience would not at all be experience of this one, this particular, thing. (Husserl, 1973a, pp. 31–32)

Throughout his work, Husserl developed the idea that the cognition of an object is an embedding into the existing semantic context, instantiating, exemplification of existing meanings and meaning structures. This understanding certainly implies an answer to the question of the nature of primary, initially given a priori cognitive concepts, structures, and mechanisms. Husserl conducts a genetic study of cognition, revealing its multi-layered structure, that suggests a passive, anonymous, independent of the reflective Ego, level. What we call verbal thinking turns out to be just the tip of an iceberg, a huge part of which is hidden.

The student of Husserl M. Merleau-Ponty, addressing the concept of the body as a counterpart of the Husserlian active Ego, draws attention to the passivity and anonymity of the body. According to Merleau-Ponty (2002), Ego is not the initiator of the processes occurring around it, but only expresses them in language. The body can record the processes taking place, but it never fully owns them. What does this mean? We cannot make ourselves understand anything, we can't control thoughts that arise spontaneously, let alone emotions. We cannot force ourselves to love, or, on the contrary, to feel disgust at something that is experienced as pleasure. Being a part of nature, rooted in a single spatio-temporal physical world, we cannot help but react to changes in the environment, to objects-stimuli in a certain way, including changes that support homeostasis. All this is not in our competence. Our cognition, whether directed inwards or outwards, is biased by transcendental entities and mechanisms that only indicate their presence by pointing to the very a priori that we do not own, but that own us. The discovery and research of these a priori, carried out in reflection, is extremely important, since it allows us to identify the basic cognitive concepts and mechanisms that fund our experience and provide its theoretical understanding. Moreover, this allows us to adequately assess our ambitions in the field of artificial intelligence, limiting them to weak (or narrow) artificial intelligence, which focuses on modeling of specific cognitive procedures.

Phenomenology, carrying on the transcendental tradition, explores the boundaries of cognition indicated by those a priori that are discovered and explored through phenomenological reflection. Phenomenological reduction allows us to identify transcendental a priori grounds of cognition of meaning structures and mechanisms that provide the possibility of cognition, revealing through the abilities of Ego to discover more and more new features of objects. This way of research and identification of various a priori will lead Husserl at his later period to the idea of a unified objective totality, directly related to nature, that is, to manifold of sensually perceived objects, and through it —

to all things in existence: human beings, animals, cultural values, and so on. Everything that exists in the world, thus, appears to be related to nature. For Husserl, it is allowable to talk about the naturalization of the spirit! This naturalization is based on the fact that everything that exists in the world takes its place in the space-time sphere. Everything is located somewhere, has a spatial localization, this place can be defined as *here* or *there*. Any cognitive act, being a real temporal event of consciousness, can be considered from the side of its space-time structure. Accordingly, any ideal object that is constituted in these acts has its real temporal correlate. The phenomenological method of Husserl is the bridge that brings together philosophical reflection and empirical research of cognition. Since all spatio-temporal objects can be measured using instruments, we have access to both the sensuously perceived objects themselves and their non-sensuously perceived correlates, because non-sensuously perceived objects, also belong to this world (aus der Welt), which is a single spatio-temporal horizon. Husserl makes an extremely important phenomenological observation that the existence of the real can have only one meaning of *existence in*, that is, being in the universe, in the open space-time horizon, in which there is constantly a real awareness of the object through a set of individual apperceptions, initially transcended by meaning. Meaning, then, turns out to be a way of knowing and organizing the world at the same time. It means that the boundaries of meaning coincide with the boundaries of the world.

In the early period of his work, in *Logical Investigations* (Husserl, 1970), justifying the correlation of sense and ontological structures, Husserl studied not only consciousness as a mental universe filled with various kinds of ideal meaningful objects, but also consciousness as a way of building the object world. If for Frege's logic the cognitive aspect of thinking remained on the periphery of his research project, then in the construction of phenomenology, the answer to the question *how* is extremely important. Husserl's conception of language and logical semantics is cognitively based. Consciousness is considered by Husserl as a set of cognitive meanings-bestowal acts of a special kind, in which semantic minings — the meanings of language expressions — are formed. In addition to semantic sense — linguistic meaning, Husserl considers its cognitive correlate (Sinn), which characterizes the corresponding cognitive act. This approach implicitly contains an idea that is extremely important for understanding the development of the phenomenological method. The idea is that any ideal object as a meaningful *static* objectivity must be considered from the point of view of its genesis, taking into account the *real*, temporal cognitive process. This view gives us an understanding that any ideal object, abstraction of the highest level is not an initially given entity stored somewhere "out-of-the-box" in a ready state, rather it is "constituted" in real temporal cognitive act.

Husserl, as it were, weaves ideal meanings into the fabric of the real cognitive process, drawing attention to the fact that the ideal object is also an experienced object. The ideal differs from the real only in the mode of experience. Husserl interprets the meaning as the moment of identity of co-directed cognitive acts. The very intention to identify turns out to be a fundamental a priori characteristic of cognition. The process of identification is associated with cognition as a typification of objects, which avoids the infinite

variety of objects by transforming the transcendent world of stimuli into an *Umvelt*, or *world for the agent*. Any animal, including a human being, lives in a typed world, perceives any object as a type, reacting to it in a typical way that is fixed in the experience. A cat reacts to a mouse as to a type, in particular as to type-of-food. We also inhabit a world of objects that are meaningful as types: a dog, a cat, a child, a house, etc. From this point of view, any Umvelt, including a human one, should be considered as a typified, initially pragmatically determined, *world for* a certain kind (type) of living beings. Taking into account the animal nature of man and the objective totality of the natural world to which we all belong, it becomes possible to talk about common, not only human, foundations of adaptive cognition a priori: cognitive prototypes (proto concepts), cognitive principles and mechanisms that are inherent not only in man, but also in other animals.

When researching cognition, Husserl uses the expression *constitution of an object*, which means for him a specific activity of consciousness, thanks to which objects are perceived not as independent of consciousness (like a reflection in the mirror), but are formed from the components of consciousness. This line of Husserl's thought is closely related to another important feature of phenomenological method of inquiry — intentionality (directedness to). Consideration of consciousness from the side of intentionality will allow Husserl to substantiate phenomenologically the *transcendence* of the object world. For us, this means that although any object, being the result of cognitive processing and interaction of the agent and the environment, acquires the status of a phenomenon or *object of my Umvelt,* a priori determined, it is at the same time, due to its spatial localization, naturally perceived as an external object, initially opposed to the transcendental Ego. Due to intentionality, subject-object distinction is initially sewn into cognition, where the former is considered as an intentional, directed to, bipolar relationship. The transcendental Ego turns out to be an integral part of the a priori structural characteristic of consciousness, the disappearance of which is equivalent to the disappearance of the very possibility of cognition and the world. The transcendental Ego, as a condition of cognition, must be distinguished from the empirical Ego, which *exists in the world*. Empirical Ego can completely or partially disappear, for example, as a result of memory loss: a person does not remember himself, she does not know who she is; or as a result of autopsychic depersonalization, when alienation of thoughts, feelings, motives, etc. occurs. The man says: it is not me, it is not my thoughts. Can be that man in the mirror sees himself, but feels that it's not him, but someone else looking at him from there and so on. It is obvious that in all these cases, arguing and analyzing the situation Ego, as the subjective pole of self-reflection acts, is preserved, it is the deformation of empirical Ego that occurs, and the boundaries of this empirical self-coincide with the individual inner experience.

The distinction between Ego that constitutes the world and the empirical Ego that exists in the world turns out to be intentionally conditioned in phenomenology. Intentionality justifies the pre-destination and unavoidability not only of the Ego that constitutes the world, but also of the transcendence, the primordial reality of the objects of the world. Considering the temporal embodied process of cognition as the realization of cognitive a priori, as an initially set intention in the outside, we thus recognize that Ego

and the environment are indispensable full participants in the constitution of the world-for-agent. If cognition is concerned in the context of adaptation taking into account the concept of intentionality, it should be borne in mind not only the adaptation of the organism to the environment, but also the potential environment, enabling the transformation of the environment in the world-for-agent. Any living system, from a single-celled organism to a human, captures and processes only those data that it is ready to accept and process on a priori cognitive basis. These a priori are found in empirical research as certain presuppositions, dispositions, and in the centuries-old practice of philosophical reflection as irreducible, necessary conditions of our experience.

Phenomenology was originally conceived by Husserl as an unconditional descriptive theory, as an attempt to go *back to the things themselves* experienced so and so. This path certainly demonstrates the ideological affinity of phenomenology and natural science. Merleau-Ponty, describing the phenomenology of Husserl, writes about the proximity of eidetic phenomenology and empirical psychology, noting the possibility of a dialog of two types of sciences that are difficult to distinguish.

In speaking of eidetic phenomenology and empirical psychology, Merleau-Ponty concludes that inductive and essential knowledge are homogeneous! These are just different steps in the explanation. Husserl in *Experience and Judgment* (1973a) has drawn attention to the fact that "the term 'induction' is useful because it suggests *vordeutet* (itself an 'induction'), induction in the ordinary sense of a mode of inference and also because it implies that the latter, for its elucidation to be completely intelligible, must refer back to the original, basic anticipation" (p. 32).

The proximity of phenomenology and empirical knowledge is shown by the attitude of the founder of the phenomenological method to biology, which he expressed in the unpublished in his lifetime *Addendum XXIII of The Crisis of European Sciences and Transcendental Phenomenology* (2013):

> Biology's proximity to the sources of evidence (*Quellen der Evidenz*) grants it such a proximity to the depths of the things themselves (*Tiefen der Sachen*), that its access to transcendental philosophy should be the easiest and with it the access to the true a priori to which the world of living beings refers. […] Hence, it seems to me that biology, which is apparently inferior to mathematics and physics and that for so long has been considered almost pityingly by physicalism, as a preliminary phase, incomplete and purely descriptive with regard to the subsequent physicalistic "explanation," has always been able to remain closer to philosophy and to true knowledge. (p. 7)

From Husserl's point of view, biology, being a truly universal science, must encompass the entire concrete world, implicitly including physics, and by turning to the study of correlations of this world, become a "completely universal philosophy" (Husserl, 2013a, p. 8). The turn to biology meant that Husserl's attention focuses on human being as a representative of the animal world, and his/her biological nature is considered as the starting point of the study. In *Phenomenology on Intersubjectivity* (Husserl, 1973c) he postulates

the existence in the human environment (Umwelt) and in the human being itself of special layer — "a layer of animality (das Tierische), that is to say, that which is shared with the animal" (p. 180). As a result, Husserl comes to the idea of a generative a priori underlying animal nature, grounding not just the human Umwelt, but also Umwelts of other animals.

Analogizing Appresension as a Basis for Amodal Completion

Husserl addresses analogizing appresension in Cartesian Meditations when he is confronted with the problem of the Alter Ego and inresubjectivity. However, well in advance, right after *Logical Investigations* (1970) in unpublished during Husserl's life *Thing and Space. Lectures of 1907* (1973b/1997), and written a decade later, in *Analyses Concerning Passive and Active Synthesis* (1966/2001) which also was not published in his lifetime Husserl so to say was doing the groundwork for further considerations of the interconnection of intersubjectivity and subjectivity. This research goes through several stages, among which the first and extremely important is how our consciousness constitutes the thing — *the object of straightforward experience*. In his view, this process is a transition from passivity to activity which results in forming of an object as it is "given" to consciousness. The very first, passive syntheses of an object presupposes the new answer to "Kantian question of how we take several different appearances to be appearances of one and the same object. […] First, having a unified perceptual consciousness across multiple appearances requires that the appearances have certain sensible qualities in common" (Husserl, 1966/2001, p. 10]. In turn this requirement is guaranteed due to specific associations that ensure unity and diversity and include pairing, similarity, uniformity, heterogeneity, fusion and contrast, etc. In particulat the associations, based on pairing and similarity are the prototype of the analogizing appresension.

Alter Ego and his/her subjective experience is not given to us initially and directly, so the intentional experience of the Other, according to Husserl, is characterized by mediation, arising on the basis of the *primordial world* and giving the opportunity to present to consciousness something that nevertheless is not itself present and can never achieve self-presence. We have here, accordingly, a kind of making "co-present," a kind of "appresentation," in Husserl words (Doyon, 2019, p. 109). In the context of the Cartesian Meditations Husserl needs it to show that Alter Ego is constituted as a projection of Ego. This projection is based on a more fundamental, low-level procedure of *likeness* between a new stimulus (other body in our case) and a model object experienced earlier. This analogy supports *a transfer of sense* from the model object to the external thing, whereby the latter is typed so and so. Thus, in Husserl's words: "Even the physical things of this world that are unknown to us are, to speak generally, known in respect of their type" (Ibid., p. 111). The ground for the appresentation lies an even deeper procedure of pairing. Ego and Alter Ego are always and necessarily given in an original pairing. Pairing manifesting itself as a pair and then as a group or a plurality, is *a universal phenomenon of the transcendental sphere,* at the same is a primal form of association. The characteristic feature of pairing is that, in the most primitive case, two objects are given intuitively in unity of a consciousness and

thus in pure passivity as data appearing with mutual distinctness, they have found a phenomenological unity of similarity and thus are always constituted exactly as a pair (Husserl, 2013b). In pairing, there is a mutual awakening and overlapping of senses associated with the members of the pair. In the extreme case, this overlap is expressed as a complete likeness. As a result, there is a mutual transfer of senses in paired data, that is the very apperception. Two well-known Husserlian examples illustrate the idea and mechanism of appresentation and pairing. "An appresentation occurs even in external experience, since the strictly seen front of a physical thing always and necessarily appresents a rear aspect and prescribes for it a more or less determinate content" (Doyon, 2019, p. 109). And then: "The child who already sees physical things understands, let us say, for the first time the final sense of scissors; and from now on he sees scissors at the first glance as scissors but naturally not in an explicit reproducing, comparing, and inferring" (Ibid., p. 111).

It is important to note that Husserl distinguishes between different types of appresentation. In more detail this theme is presented in (Husserl, 2013b). That way, Husserl is talking about *a concrete appresentation*, which he calls an *indication*. An example of this is the hunter's perception of a trail left by a wild animal, which tells the hunter that the animal is somewhere nearby and thus indicates its co-presence. As a result of this considerations, Husserl arrives at differentiation of "(1) apperceptions referring to a simultaneous content (or co-presentations), (2) anticipatory or prospective apperceptions, pointing to future incidents, and (3) retrospective apperceptions referring to 'ad-memorized' content" (Ibid., p. 174), where ad-memorization splits into *plain* (as illustrated by trail-example) and analogizing one (manifested as *an old toy from my childhood, coffee stains on my book from this morning*, etc.). All this strongly suggests that appresentation is a fundamental universal cognitive procedure that underlies acts of different quality and different levels is primarily associated with typing, or universal understanding. In consistence with Husserl's later writing this cognitive interpretation of appresentation corresponds evolution of his understanding of perceptual experience as the process of realizing empty intentions without appealing to imagination. To recognize the stimulus presented, we only need to recognize the corresponding type (the model object stored in memory). This makes clear the instantaneous nature of pre-understanding based on the transfer of meaning. It is impossible to understand something for three hours or ten minutes, the understanding is an immediate act of point nature.

All the above considerations clearly indicate the specific substantiating character of appresentation. This cognitive procedure is indeed a fundamental cognitive mechanism which is at the core of cognitive activity. Its task, apparently, is to typify the world, allowing human beings and other animals to avoid the infinite variety of the world, to structure it in accordance with the structural organization of the agent itself. Of course, this understanding of appresentation expands our definition of cognition, including the intuitive, non-verbal, non-reflexive level, and can be considered as a justification for cognition in the context of biological adaptation and evolution. It is habitual to animals, and we are learning more and more about their proto-thinking and proto-consciousness from experimental data. They have a real primitive ontology, they live in the world of objects-types

just like us. A cat reacts to a mouse as a type. Animals inhabit the world of whole objects, rather then those parts of them that are given in perception. Manifestations of appresentation can be found in a variety of areas: in categorization and instance-based learning, in the formation of concepts and rhetoric reasoning. As an illustration, consider the closest cognitive procedure of amodal perception.

The term *amodal completion* was coined by Albert Michotte. Interestingly, he offered an explanation of the procedure indicated by this term in a phenomenological way. It is the ability to perceive an entire (completed) object when some parts of it are occluded. Nowadays, it is common to illustrate the difference between a modal and an amodal completion using the example of a Kanizsa triangle (see *Figure*). The perception is amodal, as in the case of a triangle in the background, when we complete constructing an object hidden by an ocluder. This process is considered to occur automatically and unconsciously. Modal completion is under way when an object isconsciously experienced in front of inducers, as the perception of the white imaginary triangle.

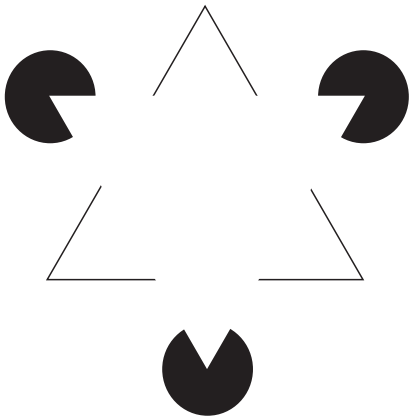

Figure. Kanizsa triangle

Amodal completion is a particular case of our ordinary perception of the world. Almost constantly, we perceive an object as a whole based on incomplete information. In most cases, objects appear partially occluded to us, and we complete the hidden parts without even noticing it. The same is true for the perception of three-dimensional objects, since we never have simultaneous access to such objects from all sides. Despite the apparent evidence, the phenomenon of amodal completion is still widely discussed in literature. In particular, the debate on how it is represented neurally is still far from over. The throughout survey of relevant neouroimaging findings can be found in (Ferencz-Flatz, 2012). In this regard, it is appropriate to mention the so-called *identity hypothesis* (Thielen, Bosch, van Leeuwen, van Gerven, & van Lier, 2019), which claims that modal and amodal completion are caused by similar mechanisms.

Even this superficial description of amodal perception suggests a similarity between this cognitive procedure and Husserl's appresentation considered above. First of all, it should be noted that Husserl himself practically indicated the proximity of these proce-

dures when describing the process of cognition. Thus, in the second volume of the *Logical Investigations* he writes:

> If I see an incomplete pattern, e. g. in this carpet partially covered over by furniture, the piece I see seems clothed with intentions pointing to further completions — we feel as if the lines and coloured shapes go on "in the sense" of what we see — but we expect nothing. (Husserl, 1970, p. 211)

Husserl (1973b/1977) returns to this topic and explores it more deeply, treating an example with the perception of the table, which we always see from a certain side. It is obvious that the table has an opposite side and an invisible lower part. Nevertheless, we perceive the table as a whole, as a unity of the visible and the hidden. "Viewing the front side of the table we can, whenever we like, orchestrate an intuitive presentational course, a reproductive course of aspects through which the non-visible side of the thing would be presented to us" [Ibid., p. 41]. Thus, when I look at a table, I do not see just the side of it, I actually see the table as visible from this side. All these arguments are carried out in the context of the analysis of passive synthesis and associations of similarity and pairing, that is, in fact, as a clarification of analogizing apperception.

It is interesting to note that according to current research (see Nanay (2018) which provides an extensive review of the literature), the neural mechanisms responsible for modal and amodal completion are very close. In both cases, these are areas of the primary visual cortex of the brain. As the author summarizes, "in other words, from a neuroscience point of view, modal and amodal completion are very similar, if not equivalent" (Ibid., p. 4). This conclusion in support of the identity hypothesis is also confirmed by the neurophenomenological interpretation of perception in the spirit of Husserl. Both modal and amodal completion are based on an embedded and embodied cognitive mechanism, coined by Husserl as analogizing apperception, and related to the sphere of passive synthesis. In both cases, external differences are secondary to the underlying nature of this cognitive procedure. Moreover, additional arguments in favor of the universal nature of the appresentation can be found in animal cognition studies. C. T. Miller, E. Dibble, and M. D. Hauser (2001) provides evidence that nonhuman primate amodally complete biologically meaningful acoustic stimuli. Hence, we can suppose the existence of a common ancestor that is 40 million years away from us, long before the divergence of these two primate clades, from whom human and nonhuman apes inherited a common universal neural mechanism that provides, among other faculties, amodal completion.

Conclusion

The article substantiates the perspective of interaction between cognitive science and phenomenology, the proximity of phenomenological and natural science approaches to the study of consciousness. This perspective is especially relevant in the light of increa-

singly realized need for a theoretical understanding of experimental data, which involves addressing the problem of the first principles of knowledge and the external world, traditionally considered within the competence of philosophy. By the example of amodal and modal completions, I considered the basic universal cognitive mechanism that supports these procedures, coined by Husserl analogizing apperception (appresentation). It has been shown that appresentation based on pairing is the basis of passive synthesis of perception of the outworld and, therefore, is an embedded and embodied form of the initial cognitive activity inherent in various living beings. In turn, analogizing apperception appears to be based on cognitive a priori mechanisms associated with the intentional structure of cognition, which underlie the typification of the world.

This mechanism manifests itself at different levels and in different cognitive procedures, which clearly demonstrates the prospects for further research some of them already outlined in a number of papers. Thus, the article Zaitseva (2019) analyzes a special rhetorical reasoning based on an example, known as *paradeigma* since the time of Isocrates and Aristotle, and demonstrates that its cognitive basis is still the same appresentation. In another article (Zaitsev & Zaitseva, 2019), the same mechanism is used to model instance-based concept learning. In particular, a specific rule for concept introduction based on the identification of the presented stimulus and the model object is based on appresentation. All these and other works of researchers in the phenomenological field show that the neurophenomenological project is very fruitful and has a number of important advantages over the armchair philosophy in the study of experience, mind and consciousness as well as cognitive faculties of a rational agent.

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