

THE EXTENDED MIND AND THE OBJECTIVITY OF COLORS AND SOUNDS “OUT THERE”. A NEW AND NON-REDUCTIONIST UNDERSTANDING OF SENSORY PHYSIOLOGY

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Abstract. Based on inconsistencies of the reductionist theory of sensory physiology this essay attempts to show that: 1) qualitative sense perceptions (qualia) are just as *objective* as the quantifiable physical and physiological process cascades described in sensory physiology; 2) the function of these process cascades and of the central nervous representation areas *is not to cause* perception, but *to mediate* it and *to render it conscious*; 3) the process of perception is not only a physical and physiological one, but at the same time a *psychological, mental* process, for which the physical and physiological process provides but the necessary material *condition*; and 4) owing to this condition, the mental process of perceiving extends out into the world, beyond our organism, to the objective contents of perception “out there” (*extended mind*). This amounts to a new comprehensive understanding of sense perception which can equally account for the objectivity and reality of the perceived sensory qualities and quantities in the world, the material processes of sensory physiology, and the perceiving human mind.

Keywords: sensory physiology, sensory psychology, mental, qualia, objectivity, extended mind, perceive, perception, cause, condition

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ПРОДЛЕННЫЙ УМ И ОБЪЕКТИВНОСТЬ ЦВЕТОВ И ЗВУКОВ «ТАМ СНАРУЖИ». НОВОЕ И НЕРЕДУКЦИОНИСТСКОЕ ПОНИМАНИЕ ФИЗИОЛОГИИ ВОСПРИЯТИЯ

Питер ХЮССЕР

Резюме. Основываясь на несоответствиях редукционистской теории в физиологии сенсорных систем, это эссе пытается продемонстрировать, что: 1) качественные чувственные восприятия (квалиа) столь же *объективны*, как измеряемые количественно каскады процесса физической и физиологической природы, описываемые в физиологии ощущений; 2) функция этих каскадов процесса и областей представлений, образуемых центральной нервной системой, не заключается в том, чтобы *вызывать (быть причиной)* восприятия, но состоит в том, чтобы опосредствовать и *сделать его сознательным*; 3) процесс восприятия является не только физическим и физиологическим, но одновременно и *психологическим, умственным* процессом, для которого физический и физиологический процесс обеспечивает необходимое материальное *условие*; и 4) из-за этого условия, умственный процесс восприятия распространяется в мир, вне нашего организма, на объективное содержание восприятия «там снаружи» (*реализует продление [extension] разума*). Это составляет новое всестороннее понимание чувственного восприятия, которое может в равной степени учитывать объективность и реальность воспринимаемых чувственных качеств и величин в мире, материальные процессы сенсорной физиологии и воспринимающего человеческого разума.

Ключевые слова: физиология органов чувств, сенсорная психология, психика, первичные ощущения, объективность, продленный ум, воспринимать, восприятие, причина, условие

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1. Introduction: The reductionist understanding of sensory physiology

The present understanding of sensory physiology is based on a reductionist interpretation of psycho-physiological processes. Colors, sounds, and other sensory experiences are believed to be the ultimate effect of the cascades of physical and physiological processes which propagate from the objects to the sensory organs and from there via the sensory nerves into the central representation areas of the brain. These brain parts then “process” the incoming physical “signals” and thereby supposedly “produce” colors, sounds or other perceptions. Thus, for today’s theory of perception colors and sounds do not exist out there in the world objectively; the sense-perceptible world around us is believed to be a subjective illusion produced by the sense-nerve-system. This is essentially how sensory physiology is presently taught in medical education [FU Berlin, 2007; 2008]. But this view can be challenged.

2. The inconsistency of the reductionist understanding of sensory physiology

There is a rarely reflected inconsistency of the present reductionist understanding of sensory physiology the acknowledgement of which leads to a peculiar paradox: If the perceived world is an illusion, then sense-organs, brains and brain processes must be illusions, too. Why? Because *only through sense perception* (or technically assisted sense perception) can we know of such organs and their processes. Epistemologically, there is no difference between a sense perception and the sense-nerve-organization which is necessary for gaining such a perception [Heusser, 2017].

Thus, if it were really true that perceived sensory qualities such as sounds or colors are only products of the brain, then the same were true for brains. But this would lead to the calamity that brains are illusions, created by other brains, which then would have to be illusions, too, and so on. This is absurd, of course. In other words: if consequently thought to its very end, the present theory which states that sensory qualities are brain products abolishes itself [Heusser, 2017].

To state it positively: If brains and sense organs are real, then other, equally perceived objects can claim reality, too. Hence, one cannot dismiss colors, sounds and other sensory qualities as “illusions” and accept sense organs and brains as “real”. Epistemologically and ontologically, all sense-perceptible elements have to be treated alike.

3. The problem of “primary” versus “secondary” sensory qualities

But in this respect an objection might be made. Based on reductionist thinking habits one might be tempted to object that colors, sounds and other sensory qualities do not exist out there *in the way in which we experience them*, as sensory *qualities*, but only as *quantifiable entities* such as *acoustic or photonic “waves”*.

But how do we know of acoustic or photonic “waves”? Their factuality and existence can only be acknowledged on the basis of direct or indirect objective *perception*, i.e. in essentially the same way as colors and sounds. Of course, acoustic or photonic waves have the advantage of being *quantifiable*, whereas sounds and

colors are *qualitative* in character. But the qualitative or quantitative nature of a perception does not render them more or less real, contrary to widely held beliefs.

These beliefs are usually derived from John Locke's distinction between the so-called "primary" and the "secondary" sensory qualities [Kienzle, 1997, p. 92]. The "primary" elements are the *quantifiable* ones such as size, weight, movement, etc., whereas the "secondary" qualities are the proper sensory *qualities* as such, i.e. sound, color, smell, taste, etc. The "primary" or quantifiable elements are held to be objective, whereas the "secondary" qualities are supposed to be subjective. However, as Rudolf Steiner pointed out already in his introductions to Johann Wolfgang Goethe's natural scientific writings, the "primary", quantifiable elements have absolutely no epistemological or ontological advantage over the "secondary" elements, they are only simpler and easier to handle [Steiner, 1973a]. Both need to be accessed objectively through perception. In fact, out there in reality we never experience qualities or quantities *alone*, but always together, in unity, for example when we see, hear and touch a silver-colored ringing bell of a certain size, weight, and movement.

4. The irreducibility of sense perceptions

Thus, colors and sounds cannot be reduced to photonic or acoustic waves, and smells and tastes cannot be reduced to their molecules. The "secondary" qualities always appear together with their "primary" quantifiable correlates. Extended to sensory physiology and perception this means: Not only the elements of the *physical and physiological process cascade exist objectively* such as atoms, waves, sensory receptors, action potentials, neurotransmitters, etc., *but also the colors, sounds, smells, and tastes* for whose perception these physical and physiological cascades are necessary.

5. The function of the physical and physiological process cascade: to mediate but not to cause perception

But if both, the sensory qualities *and* their corresponding cascades of physical and physiological processes exist, *what, then, is the function of these processes?* Obviously it is not to *cause* colors, sounds, or other sensory qualities, because, as I have tried to show, these qualities exist *out there* in the world in the same way as our sense organs and brains in our body. So the function of the physical and physiological processes described in sensory physiology can only be to *mediate* these qualities for the sake of perception *out there* [Steiner, 1973b; Heusser, 2017].

Given the thinking habits of reductionism, this is most certainly an unfamiliar and challenging statement. But it completely complies with all empirical facts of sensory physiology and perception. Just look at what these empirical facts really show, in contrast to the *assumptions* that constitute the prevailing theory of sensory physiology. Let's say you meet John and see that he is wearing a red pullover. *Where* do you perceive the red of this pullover, empirically? Certainly not in your brain. Even if the neurophysiologist would examine your brain in all details at the very moment when you perceive John's red pullover, he would not find any trace of red in

the brain itself, but only electrophysiological and biochemical processes. *Empirically*, the experience “red” is located *out there*, on John’s pullover.

This fact is of course known in sensory physiology, too. But it has been interpreted in a peculiar way. Because of the reductionist *assumption* that colors and sounds are *produced* by the brain, one had to explain why they are not experienced in the brain itself, but instead *out there*. This led to the invention of the *theory of “projection”*: Colors or sounds are supposedly produced by and in the brain, and then “projected” into the world, at the location where they are factually experienced (Smythies, 1954). However, this “projection” is a purely speculative construction, without any support from empirical evidence at all [Heusser, 2017].

6. The functional relation between the central nervous representation area and the externally located perceptual experience: to render the latter conscious

But why has the brain been loaded with the assignment to produce colors, sounds and other sensory qualities? Because the *experience* of, let’s say, John’s red pullover arises in your consciousness only at the very moment when the physico-physiological cascade running between the pullover and your sense-nerve-system has arrived at its “final destination”, i.e. at the appropriate *central location of your brain*, for example at the primary visual area. This is why this central location is made causally responsible for producing the perceived sensory quality.

But neither is there any empirical evidence for the *production* of sensory qualities nor of any other contents of consciousness by brains – on the contrary: the transition between brain and consciousness is the great void, the “explanatory gap” of neuroscience (Levine, 1983) –, nor should one forget that the contents of sensory experiences appear in the external world. So, what is the functional relation between the brain with its central representation area to where the cascade of physiological processes runs, and the “red” which is experientially located out there? Obviously, this functional relation is that the central representation area provides the condition for the appearance of *consciousness* of the “red” perceived out there [Steiner, 1973b; Heusser, 2017].

7. Consequences for an encompassing psycho-physiological understanding of sensory physiology

What we have elucidated so far is that the cascade of physical and physiological processes between John’s pullover and the brain *mediates the perception* of the pullover’s “red” and that the function of the appropriate central brain location is to render this perception *conscious, out there*.

But what does it mean when we say that the physico-physiological process cascade propagating from John’s pullover to the central representation area of the brain mediates the conscious perception out there? There is no doubt that *this cascade* – from its inception till its very end – consists entirely of *physical and physiological, i.e. material* processes. And usually sensory physiology focusses centrally on these material processes. In fact, in medical education sensory physiology is presented as a

completely mechanistic process, as a sequence of physical and physiological events running from the objects to the central nervous location [FU Berlin, 2007; 2008].

But sense-perception is not only a physical and physiological but an encompassing *psycho*-physiological process. In fact, to *perceive*, to *experience*, to be *conscious*, etc. are not physical or physiological but *mental*, *psychological* categories. Epistemologically, it is not correct to use these categories to designate or describe physiological or physical processes; they should be reserved for the *mental or psychological* part of the overall psycho-physiological process of sense-perception. A complete theory of sense-perception would have to account for both, the physiological and the psychological parts of perception and integrate them in a unified view. Such a view is outlined in this article and has already been presented in detail elsewhere [Heusser 2017].

In fact, *the mental part constitutes the essential process of sense-perception*. “Sense-perception” is *sensu strictu* not about physical and physiological process cascades at all, but about “*perceiving*” or “*becoming aware of*” John’s red pullover out there, a purely mental function. Of course, the physical and physiological processes described in sensory physiology are the indispensable material *conditions* for this mental function, but not this function as such, and not the cause of this function. Sense perception and consciousness proper are *mental*, *i.e. immaterial* activities or states, albeit they *depend* on these material conditions. But they have to be clearly distinguished from them. One can even show that the material processes on which these mental activities depend are actually *subservient* to them as their *expressions* on the material level, a result of *top-down causation* from the immaterial level of mental activity to the material level of neurophysiology. In other words, the mental process is real, too, but it constitutes an *immaterial* form of reality [Steiner, 1973b; Heusser, 2017].

8. The extended mind and the objectivity of colors and sounds “out there”

Thus, when we say that the physical and physiological process cascade “mediates” conscious perception of the “red” *out there*, we actually say that this cascade “serves” our *mental activity of conscious perception*, and that this perception *extends out into the world, beyond our organism, to the objective contents of perception “out there”*. In this sense our perceiving mind is indeed an “*extended mind*” (Clark and Chalmers 1998): it extends into the world, to the colors and sounds, beyond the borders of our organism on whose functions it depends. These considerations amount to a new, non-reductionist, encompassing understanding of sensory physiology. This understanding can provide empirical evidence and a consistent theory for a comprehensive view of perception in which not only brains and quantifiable elements in the world prove to be objective and real, but also colors, sounds, and the other sensory qualia, and, most importantly, the human mind and its relations to the world as well [Heusser 2017].

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