RIVISTA INTERNAZIONALE DI FILOSOFIA E PSICOLOGIA
DOI: 10.4453/rifp.2023.0014
ISSN 2039-4667; E-ISSN 2239-2629
Vol. 14 (2023), n. 3, pp. 168-180

RICERCHE

The ordering mind. The Goldstein-Cassirer approach to neuropathology and its relevance today

Luigi Laino[(α)]

Ricevuto: 27 luglio 2022; accettato: 3 luglio 2023

Abstract In this paper, I will examine the Goldstein-Cassirer approach to neuropathology to determine its current potential for yielding valuable insights. To this end, I will reconstruct the philosophical and theoretical underpinnings of such a standpoint in the first four sections. What will emerge is that it entails a definition of pathology as the loss of balance in the adaption of human beings to the environment, leading to a lack of proclivity to categorical behaviour and symbolic performances. Furthermore, we will see that there are behavioural alterations which are not related to the locus of lesions. In the fifth section, I will compare and contrast the holistic stances with current research in neuropsychology. The sixth section is dedicated to conclusive remarks.
KEYWORDS: Psychopathology; Neuropathology; Ernst Cassirer; Kurt Goldstein; Holism

Riassunto *La mente ordinatrice. La concezione di Goldstein e Cassirer della neuropatologia e la sua rilevanza oggi* – In questo articolo intendo analizzare l'approccio Goldstein-Cassirer alla neuropatologia per comprendere se esso può rivelarsi ancora utile alla luce delle ricerche attuali. A tal fine, ne ricostruirò le basi filosofiche e teoriche nei primi tre paragrafi. Scopriremo che esso implica una definizione di patologia come perdita di equilibrio nell'adattamento degli esseri umani all'ambiente, a seguito della quale viene a mancare la naturale tendenza verso il "comportamento categoriale" e le prestazioni simboliche. Vedremo, inoltre, che vi sono alterazioni del comportamento non collegabili al sito delle lesioni. Nel quinto paragrafo, metterò a confronto le istanze olistiche con le ricerche contemporanee nel campo della neuropsicologia. Il sesto paragrafo contiene le considerazioni conclusive.
PAROLE CHIAVE: Psicopatologia; Neuropatologia; Ernst Cassirer; Kurt Goldstein; Olismo

[(α)]Dipartimento di Studi Umanistici, Università degli Studi di Napoli "Federico II", via Porta di Massa, 1 - 80133 Napoli (IT)

E-mail: luigi.laino@unina.it

1 Introduction

IN THE MID-1920S, one of the leading German philosophers, Ernst Cassirer, was able to access a clinic in Frankfurt (the *Institut zur Erforschung der Folgeerscheinungen von Hirnverletzungen*) which looked after patients suffering from aphasia, apraxia and agnosia.[1] The hospital was managed by Cassirer's cousin, the neurologist Kurt Goldstein, who was developing a holistic approach towards neuropathology,[2] which eventuated in his work *The organism*.[3] According to Goldstein, neurological injuries do not solely cause effects in patients in virtue of the location of brain lesions, but they alter their entire behaviour.[4] Such modification particularly impacts "categorical thought". That is, the ability to understand the abstract value of concepts and to symbolically manipulate said concepts and the objects of our daily life. In short, these patients seemed to take refuge in concrete situations, which they exploited to rearrange their experience.[5]

Cassirer saw this idea as an important endorsement of his philosophy of symbolic forms, essentially based on the principle that human culture is conveyed by symbols and "symbolic pregnancy". Indeed, signs are the material envelope of abstract meanings.[6] This led Cassirer to consider that both mediateness and immediateness characterise experience. On the one hand, the human world does not coincide with "life" – the stage that Cassirer defines as pertaining to animals and disclosing their direct belonging to the environment –; on the other hand, capturing symbolic meanings is a natural disposition of human beings, to the extent that we can say that people naturally perform mediated activities.[7] Neuropathology thus implies a step backwards from the immediate comprehension of symbols (and their mediating function) to the necessity of exploiting more concrete means to provide experience with a given order. It follows that the oft-used label "disordered mind"[8] may lead us astray from correctly interpreting what happens in an injured brain: each and every individual attempts to craft her experience by ordering it.[9]

In this paper, I will thus present the holistic approach in light of the current situation. To do so, in the second section, I will provide the philosophical core of Goldstein's thought. Then, in the third section, I will outline Cassirer's reception of it. The fourth section will contain an explanation of the general model of pathology emerging from Cassirer's chapter on the topic in his *Philosophy of symbolic forms*, which will allow us to ask, in the fifth section, whether his picture of neuropathology is still sound.

2 The philosophical underpinnings of the holistic stance

Norbert Andersch has already provided an in-depth historical presentation of Cassirer's phenomenology of neuropathology,[10] so I will limit myself to drawing attention to the conceptual cornerstones of the holistic standpoint in Goldstein so as to then compare it with Cassirer's interpretation in the next section. Essentially, we can focus on the following issues.

2.1 A non-localist theory of the brain and of brain injuries?

Contrary to commonplaces on holism, Goldstein did not negate that there were areas in the periphery of the brain that receive external stimuli and specific areas in the cortex that elaborate such stimuli. However, he refers to a "central sector" which is, to some extent, independent of this periphery and seems to designate a domain of a higher order:

> Here also we find a one-to-one correspondence between certain sectors of the periphery and certain areas in the cortex, i.e. an *anatomical* localisation is possible. But it remains unsettled how these cortical areas, which I called the *periphery of the cortex*, do function. Only performance analysis can provide information on this point. Besides this periphery of the cortex, we have large sectors which [...] undoubtedly have a significance of their own, relatively independent of the peripheral cortex. They represent, so to speak, domains of a higher order. I called them the *central sector*, which comprises the parietal, the Insula Relii, and particularly the frontal lobe.[11]

While this entails that superior cognitive functions are relatively free from the world of sense, if the categorical behaviour is tied up to the healthy state of the frontal cortex, it has a physical substratum:

> We are well justified in crediting the intact organism with a greater performance capacity than the injured one, and in admitting that the "higher" or more complex performances require a more intact substratum than the simpler ones. Therefore, we speak of a hierarchy or descending scale of disintegration, in which the higher performances are more disturbed than the simpler ones.[12]

The result is that we have a physiological theory, that is, a theory of the brain, starting from which we can nonetheless argue for the independence of the more sophisticated cognitive functions.

2.2 A non-reductionist theory of the brain

Therefore, the matter is not that behaviour has no neural roots, since the point is rather that cognitive functions are far too complex to be reduced to "physicochemical facts".[13] Indeed, we should speak of coordination between the two series of

elements.[14] Furthermore, Goldstein clearly states:

> This entire view seems problematic to us, to say the least, because it could be questioned whether *anything at all which will clarify the performances of the organism can be discovered by this method.* Could not the application of physio-chemical methods possibly mean, in principle, such a destruction of the organism, and could not the onset of the experiment alter the activity of the organism in such a way that we always obtain a modification of its normal functions which deviate irreparably from the *normal process?*[15]

And even more openly, Goldstein spells out that:

> Is it not altogether a mistake to talk about physiological facts where it would be more correct to say that we are dealing with physics and chemistry applied to a living object, *but not with a physical and chemical research of life processes?*[16]

Goldstein will thus maintain that it is impossible to "directly" grasp life processes this way. As a consequence, he leans towards a more general concept of observation, which he calls "psychological", and deals with how organisms "come to terms" with the environment on the basis of their possibilities – this defines the concept of "performance".[17] This principle sets out the methodological mistake that occurs when following too strict a physiological method. In practice the elaboration of clinical tests of this kind isolates the function from the whole organism, whereas the above-mentioned localisation is conversely "*but a dynamic process*" embedded in the whole brain and the organism:

> Localisation of a performance no longer means to us an excitation in a certain place, but a dynamic process which occurs in the entire nervous system, even in the whole organism, and which has a definite configuration for each performance.[18]

Therefore, if we equal localism to reductionism, we risk being led astray. We must restate that what we observe by differentiation of brain areas is not what really happens when a given area contributes to the determination of a specific cognitive function.[19] Besides, localisation may also give rise to the overlooking of important effects in the descriptions of pathological conditions. By focusing on specific sets of causes and symptoms, we forget that other aspects might be as important as the reasons we were originally looking for.[20] And more in general, Goldstein upholds that:

> Characteristic symptoms may be absent while there is a definitely localised lesion; on the other hand, symptoms may appear without the presence of a correspondingly localised lesion. All this shows that it is impossible to regard the presence of symptoms as simply depending upon the *locus* of the injury.[21]

Furthermore, the emphasis on localisation takes over the histopathological changes caused by the nature of the injury.[22]

2.3 "Categorical behaviour"

Bearing this in mind, I suggest that "categorical behaviour" is the answer to difficulties emerging from a strictly localist and reductionist theory of the brain. In sum, Goldstein believes that the relative independence of the "central sector" allows us to understand the most complex performances as non-reducible to the local functioning of the brain. Accordingly, with the term "behaviour" he means the non-physicalist background of human agency:

> We might point to the patient's inability to emancipate and withhold from the world, the shrinkage of his freedom, and his greater bondage to the environmental demands. The most general formula to which the change can be reduced is probably: The patient has lost the capacity to deal with *that which is not real - with the possible.*[23]

If we thus hold to how the organism behaves in complex situations, we must entertain a model that explains pathology as a general disturbance which «proceeds from the highly differentiated and articulated state to a more amorphous and total behaviour».[24] What we observe in humans is a complete modification in dealing with abstract situations which nonetheless stems from the impairment of single processes. Accordingly, the clinical isolation of these moments would cast a shadow on the global meaning of a given disorder.

2.4 On the nature of symptoms

Speaking of pathologies, we must address symptoms. In general, there are two distinct sets of symptoms which manifest to different degrees. The symptoms concerning the comprehension and manipulation of abstract references influence all "fields of performance" and are not related to specific damage in a given cerebral area. It follows that the functioning of the symbolic faculty cannot result from simple physical explanations since it can be only revealed by studying people's behaviour in its entirety. This does not mean that such impairments do not have physical causes, but only that they are the effects of multiple layers, including the way in which people react to impairments, which generates feedback on their pathology.[25] Goldstein so comments that the holistic approach presupposes «that every phenomenon – normal as

well as pathological – is an activity of the whole organism, in a particular organisation of the organism».[26] This aligns with the following statement given in his main work: «Symptoms are *answers, given by the modified organism, to definite demands*: they are attempted solutions to problems derived on the one hand from the demands of the natural environment, and on the other from the special tasks imposed on the organism in the course of the examination».[27]

2.5 The "catastrophic condition"

Brain injuries entail the emergence of a "catastrophic condition" in patients, due to the anxiety of not being able to realise their capacities. This leads to the loss of their "existence", to wit, «an epistemological concept based on phenomenological observations, which enables us to describe normal and pathological behaviour and to give a definite orientation for therapy».[28] Retrospectively, Goldstein judges his method to be «a kind of philosophical anthropology».[29]

2.6 Therapy and health

Clinical analysis shows that patients perform better if involved in familiar or concrete situations.[30] Thus, the therapy must focus on the limitations which arrange «an environment where no demands are made on him – i.e., the patient – which he cannot fulfil and which would lead him to catastrophe».[31] This has two consequences. On the one hand, recovery does not consist of a *restitutio ad integrum*, which is often impossible in the case of brain injuries. Rather, everyone can heal if «becoming healthy demands a transformation of the individual's personality which enables him to bear restrictions».[32] Therefore, for Goldstein, health is a very inclusive concept since the adaptation of the patient is not different from that of a non-injured individual:

> a particular part of therapy consists in making the patient understand the problem as much as possible in all of its details. It will help him to take restrictions, particularly if he becomes aware that his situation is in principle not so very different from that in which normal human beings "exist".[33]

On the other hand, it is important that the therapist guides the patient and shares with her the whole process towards a new balance: «it is our task in therapy to help the patient realise the necessity of restrictions in becoming healthy».[34]

According to Goldstein, this should explain, at least to a certain extent, why the relationship between the therapist and the patient is not based on psychoanalytical "transference". However, he does not go into detail on the topic.

3 Cassirer's reception of Goldstein's approach

Even though the sources that I mentioned in the foregoing section are subsequent to Goldstein's direct contacts with Cassirer, they nonetheless represent the initial background of his endeavour and thus the starting point of Cassirer's analysis on the pathology of symbolic consciousness. Let us now fill this historical gap by delving into Cassirer's correspondence.

Cassirer outlined his reception of Goldstein's ideas in the letters he sent to his cousin before the publication of the third volume of his masterpiece, *Philosophy of symbolic forms*. The first important letter to Goldstein is dated 5 January 1925. Cassirer provided comments on Goldstein and Gelb's interpretation of colour amnesia and pinpointed that the "disease" pertains to the "symbolic consciousness", while the "sensitive consciousness" is intact. This sets the following task:

> To determine the relationship between these two moment – to show how the symbolic and the sensitive consciousness interweave and mutually condition each other in the structure (*Aufbau*) of the normal spiritual life –, that seems to be, for me, one of the essential tasks of a future psychology and phenomenology.[35]

Cassirer thus postulated that in normal conditions individuals do not perceive that the two types of consciousness are different, and conceived of pathology as the rupture of the unity of experience (*Erlebnis*). This means that being ill entails the divorce between sensations and abstract performances, with the consequence that behaviour slides into the concrete sphere. In this respect, Cassirer recalled his book on language, where he had already provided a description of the development of language which mirrored the transition from concrete to the authentic symbolic conduct via different intermediate levels. In short, language was seen as going through several levels and sub-levels of objectivity encompassing sensitive, intuitive, and conceptual functions. Starting from the pure expression of motions or inner states, one enters the concept of reality extending in space and then reflecting on time. In the end, language is arranged following principles of categorisation and purely relational concepts.[36]

In applying such a model to neuropathology, it seems that brain injuries cause a reversal of the process and that the primitiveness of Goldstein's patients parallels the historical development of languages. Instead of rearrangements implying the overcoming of concrete expressions or shared experiences in favour of the establishment of "categori-

cal behaviour", people with brain injuries are forced to shift their attention from abstract and symbolic representations to immediate presentations of meanings. That is, to most trust what is concretely present in their environment or relatively basic for their experience. An illustration of this symbolic fall is given in another letter sent to Goldstein on 24 March 1925. Cassirer mentions the case of Schneider, who was suffering from right hemiplegia and was unable to state that he could write with his right hand, while this was generally possible about his left hand. Cassirer concludes that:

> In all of these cases, it seems to me that the most characteristic element consists of the fact that patients handle and may manipulate – as well as healthy people can do – those contents that are for them sensitively *present*, [...]; however, they promptly fail, as soon as an act of "representation" is demanded of them instead of a sensitive presentation, a simply "symbolic" performance instead of an actual performance [...]. The material of optical data, but also that of other perceptive items, becomes meaningful [...] only when it is present to them and they can sense it.[37]

This leads Cassirer to affirm that the pathological condition exists when it becomes impossible to conceive of «what is present representatively, as well as of what is representative as it were present»,[38] which is more or less, as we have seen, the definition that Goldstein will give in *The organism*. Furthermore, both non-impaired and pathological behaviour are holistic. In the above-mentioned case of Schneider, apraxia relates to a linguistic disorder which does not depend on a brain injury in the areas of language.

Cassirer thus proceeded further to consider the pathology of the symbolic consciousness more generally. He rephrased the question by comparing the "possible" and the "real". While non-injured people are accustomed to focusing on the symbolic meaning and are at ease with possible reconfigurations of what is real, subjects with brain injuries are not. For instance, people with brain injuries are incapable of mimicking hammering if they are not holding a hammer, ready to drive a nail into the wall. At this point, the flexibility of symbolic and representative acting is replaced by the sticking to the data: the faculty of making present something which is absent loses its relevance, and the person might be more comfortable with reproducing simple, partial motions or working on concrete objects and situations.

Finally, Cassirer comes back to the main topic and submittes to Goldstein a clear statement on the distinction of the abstract from the sensitive consciousness. He writes:

> [...] Of course, I was utterly convinced by your explanations on the decisive role that the optical processes play in voluntary motions; nevertheless, it seems to me that perhaps "optical representations" as such or conceptually-*given* experiences are not crucial. Rather, this pertains to the *function* inherent in them. The lack of this function, of the "symbolic ideation", hampers the realisation of the "motion sketch" – an obstruction that would here rest less on the lack of seeing (*Sehen*) rather than on that of "vision" (*Sicht*).[39]

Truth be told, the existence of an ideal form of perception had been already defended in January's letter, the discussion of which I left open. Indeed, Cassirer raised criticisms against Goldstein and Gelb's idea that the perception of colours hinged on a specific function. The problem was that agnosia reflected on language, but only as far as colours were concerned; in short, language did not work only for labelling colours. Whence the question:

> how should one envisage that the conditions for categorical behaviour are given *in general*, while one does not succeed to perform this behaviour concerning a *determinate* field of sensory qualities?[40]

Cassirer's solution to this puzzling question was brilliant. To his eye, neither the perception of optical data nor the categorical behaviour as regards language were dismantled; the pathologic effect conversely pertained to their integration, their "correct coordination".[41] Might that have thus influenced Goldstein's parlance concerning the dualism between physiological and psychological facts? As I have suggested, indeed, Goldstein believed that performances are correlated with physicochemical processes,[42] and hence we may propose the idea that illness stems from a defect in this link. Pathology is but an interruption of such a continuity:

> If we wish to understand the *nature of part processes*, the best approach is the study of phenomena found in diseased persons. Here we are dealing with performances which take place in isolated parts, because all damage severs parts from the organism, or to put it more precisely, divides the organism into parts.[43]

In sum, holistic thinkers claim that disorders entail an overall decrease in abstract and global performances which are thus restricted to practical situations. Hence, they highlight that pathology implies the disentanglement of the abstract from the sensitive consciousness, as well as the disintegration of the organism as a whole. Let us now see how Cassirer developed his reasoning in the sixth chapter of the second part of his *Philosophy of the Symbolic Forms III*.

4 Neuropathology in the Philosophy of symbolic forms

In this section, I will outline Cassirer's model of neuropathology, as developed in his masterpiece. I will also briefly deal with Cassirer's theory of perception, since the latter will prove to be exploitable when facing transformation agnosia in the fifth section. However, I will start from more general considerations.

The kind of concreteness experienced by neuropsychiatric patients is twofold. On the one hand, it means impairment; on the other, it may hint at a form of natural readjustment – today we would speak of coping strategies. By way of example, an agnosic subject may distinguish cars from human beings by willingly focusing on their size.[44] It is also important, in this respect, that patients still tend to recognise the whole, while having difficulties in processing the details. Last but not least, the substitution of abstract with concrete relations is usually linked to non-corrupted cultural or individual memories: one of Head's patients replaced the word "black" with the word "dead", a less abstract but still "sad" concept which was not damaged by his colour agnosia.[45]

Speaking of Head, it is worth stating that Cassirer's chapter on neuropathology paves the way for a global contextualisation of the use of symbols in neurological literature. To begin with, it seems that the concept of symbol cannot be interpreted in merely conventional terms; rather, the symbol is the shell of reality. For this reason, we shift from the original "asymbolia" (the impossibility of knowing objects) to motoric aphasia (the incapacity of manipulating them), later called "apraxia". At this point, we observe the rise of holistic stances, essentially connected to the analysis of language. John Hughlings Jackson intervened with his distinction between "emotional" and "representative" statements, noticing that the latter are more often involved in aphasia than the former.[46] It follows that our experience is built modularly, implying sets of capacities of varying degrees of complexity: the closer a module is to body and emotions, the harder it is to corrupt in virtue of its well-established biological roots.[47] There is thus a whole range of ideas that Cassirer exploits to come to the conclusion, like Head before him, that aphasias entail a symbolic disorder.[48]

After these premises, I will now discuss the general implications arising from the analysis of the case studies, which are far wider reaching than those of the letters. Nonetheless, the core ideas and results do not change.

Cassirer drew attention to the fact that perception and sensation are different fields. Sensations are more basic and represent the matter of perception somewhat. Therefore, we have the content pertaining to sensory data, which is more or less the same for both injured and non-injured people; on the other hand, perception provides such content with a certain meaning or form. For instance, agnosic patients actually sense colours, although they cannot deploy general categories to classify chromatic data according to abstract rules. As I suggested, a colour may be recognised only in compliance with the reminiscence of typical statements ("white as snow"), or in virtue of the sensory characteristics of the figures associated with it. In this context, sensations are coherent with personal experiences and follow a criterion of "*Kohärenzerlebnis*", while they remain foreign to conceptual thinking.[49]

Perception has a specific structure nevertheless. It is meaningful, according to Cassirer, for it depends on the coordination of three different functions or schemes: (1) the thing-attribute relationship, (2) the spatial order of coexistence, and (3) the temporal order of succession. Cassirer's idea is that neuropathology affects one aspect and then the others following a sort of drop-down logic, implying the disruption of the continuously meaningful frame of perception and the adherence to single occurrences in sensory data.

A great number of the examples that I have presented concern the case of the miner Johann Schneider, who served in the German army during WW1. He received a head injury, but it was unclear whether mine-schrapnels penetrated his brain deeply.[50] This is an important point since the ambiguous nature of the wounds supported a non-reductionist model for interpreting his condition. His impairments can thus be seen in light of the very general framework that I introduced earlier, according to which each perceptual and cognitive function is reduced to the sensory state.

Schneider could not even knock on the door when asked to if the door did not fall under his visual field or if it was too far from his hands. This is but the replacement of space as an abstract form of coordination with kinaesthetic space: the latter is rigidly tied to the body and its motor capacities and is not transposable, having a very limited range. However, Schneider was also afflicted by agraphia. He recognised graphic signs and could even draw figures, but only by compensating the lack in the visual field with motions of his head: in practice, he exploited the motor dimension to harmonise his visual experience indirectly.[51] As soon as these motions were hampered, the compensation ceased and the meaning vanished. Cassirer explained that:

> It is not the particular sensory phenomenon as such but the syntactical organisation of these phenomena that seems to be disturbed; we seem to have before us a kind of "agrammatism" of perception analogous to what we can observe in so-called agrammatical speech disturbances.[52]

More in general, we must conceive of pathology as a state in which the capacity of "*absehen*", which means "prescinding" and "foreseeing", is endangered.[53] A person cannot overlook the fact that sensory details, as well as her ability to comprehend abstract scenarios and non-present contexts are limited. Neuropathology thus proves that perception is the demand for the unity of sensory data: once the injury has taken place, the unity is disrupted.[54]

The holistic effect of impairments is even more clear when taking the conception of time into account. It seems that its core is the notion of succession. Brain-injured people cannot manipulate it or handle situations asking for the distinction of successive and previous elements: they count the same things several times or need the help of their fingers to go backwards and forwards.

One of Head's patients, for instance, was confused when reading clocks as regards "past" and "to" commands.[55] Therefore, the whole impact of time-disorder weighs on the concept of series, which is crucial for mathematical thought. Let us assume the simple succession of natural numbers from *0* to *10* and solve simple additions within this range: in short, what we do is to move our scheme of succession along the scale, establishing a new start for the enumeration each time – so each number may equal to *0* when coming to a new task. People with impairments may not be able to perform such a switch easily. However, it is noteworthy that here the temporal disorder resembles the disorder concerning space. Each new *0*, indeed, is the origin of a new coordinate chart,[56] and time impairments resemble the lack concerning the incapacity of forming and projecting abstract spatial maps.

Moreover, there is another aspect that endorses holism. It concerns the parallelism between mathematics and language. To Cassirer's eye, both numbers and words are theoretical points delimiting the continuous flow of experience.[57] This process owes its fortune to the interweaving functions of "discretion" and "coordination" (*Zuordnung*), which are grounded in the conception of both the differentiation between the elements of a series and its unitary meaning. In fact, words establish the "being apart" (*Auseinander*) of elements, just as numbers do. However, discretion is meaningful only if tied to a universal structure. It follows that the main feature of mathematical series, as Cassirer extensively and intensively explained in his book on substance- and function-concepts, consists of their concrete universality, that is, the representation of sets of well-distinguished elements along with their general rules of development.[58]

This means that a manifold of objects is not merely the assembly of the singular parts of a whole, but also the ground for the passage from one element to the other according to established, universal principles. Hence, it is easy to forecast the direction of misrepresentations: we lose synopsis (*Zusammenschau*), while holding in our hands a disintegrated succession (*Nacheinander*) of elements.[59]

Finally, the last sub-section on the pathology of symbolic consciousness contains many examples concerning apraxia. Cassirer follows Liepmann's distinction between "ideational-" and "sensory-motor apraxia" (or "ideomotor apraxia"). In the first case, people cannot represent goal-oriented actions or complex processes; in the second case, general schemes are preserved, while disorders concern particular performances. It is sufficient, in this respect, to state that experience is made of two interwoven fields, one relating to the mental drawing of action, the other concerning the execution of the latter. Arguably, ideational is worse than sensory-motor apraxia since a loss of generality is implied.

In this field, concrete rearrangements lead to the segmentation of actions, confusion about the correct sequences in which to perform deeds or the right association between objects and actions. It may also become impossible to act by deploying objects creatively, that is, beyond the usual purposes with which they are associated. Apraxic subjects also prefer actions with few intermediate stages: for instance, they can only play billiards without bank shots, i.e. they only make direct shots.[60]

With this in mind, it is also important to notice that Cassirer's general theory of perception contains crucial claims for present studies in neuropsychology. In fact, Cassirer was convinced that perception abides by the same principles governing the objectification of reality in science. Just as mathematical and physical objects are determined following general rules of invariance and coordination, perceptual data are given only as results of schemes that allow us to select permanent properties along transformations. Accordingly, we should possess a sort of intuitive use of group theory and then perceptively infer the identity of geometrical figures through their changes. This approach even culminates in *The concept of group and the theory of perception*, which appeared in 1944. Cassirer stated:

> One can no longer stick to the conception that perception is nothing but a bundle of sense-impressions. That the perceptual world does possess a *structure* and that this structure cannot be reduced to a mere mosaic [...] may be taken as an established conclusion of psychology.[61]

Further discussion on how much this might reveal fruitful can be found in the next section.

5 The pathology of the symbolic consciousness today

I will now analyse recent ideas on Goldstein's cases: to do so, I will delve into possible objections

and then discuss what can be preserved. Moreover, I will expand our analysis to general epistemological concerns and afterwards evaluate their impact on the definition of pathology and health. But before starting with the discussion of Schneider's case, let me stress the following.

In advocating "mental realism", George Graham upheld that everything that falls outside of the physiological explanatory clause can be subsumed under the label "mental". He has given the following example: a person who was snowed under with environmental stressors and could not get out of bed. In his opinion, this reaction is mental since the brain is working perfectly: it appropriately responds to external stimuli determining pressure on the subject.[62] On the contrary, in the case of aphasia, agnosia or apraxia, the behaviour is modified on the basis of brain lesions.[63] Since holism depends on the modification of cognitive functions that are not strictly related to physical damage, we must see whether non-reducible elements or effects might be found. On this will depend the reliability of holism. We are now ready to move on.

In 2004, Marotta and Behrmann asked whether Schneider's symptoms were genuine. Once we turn to the holistic frame, indeed, might it not be the case that some of the symptoms were hysterical or overloaded with exaggerations? This is what scientists who have reviewed the case after Goldstein and Gelb have said, emphasising that Schneider could capture images in paintings; hence, they have suggested that he was accustomed to performing his integrative actions only when asked to do so by the clinical professional.[64] However, I think that the observation that other patients compensate for their agnosia the same way, and exploit the identical strategy for "lexical retrieval", does not cast a shadow on the condition of apperceptive agnosia; rather, it simply proves that kinaesthetic compensation is a coping strategy that mostly works.

Therefore, it is not by chance that Marotta and Berhmann interpreted Schneider's as a case of integrative agnosia:

> Patients with integrative agnosia appear to have available to them the basic features or elements in a display but are unable to integrate all aspects into a meaningful whole.[65]

This is more or less what was stated by Goldstein. In fact, as the case of the distinction of persons from cars has shown, subjects with integrative agnosia are at ease with an outline resembling the whole, not when they must face, say, line drawings. While seemingly identical to a single percept, the line requires the coordination of its single parts. In practice, there is less information to process in a silhouette and it becomes easier to perceive its structure: the real singular is the blurred figure, not the single points. According to Marotta and Behrmann, an impairment of the sort regarding processes pertains to each function implying the figure-ground segregation, just as it is for the holistic standpoint.[66]

However, while there is little doubt that recent approaches still maintain that disorders such as aphasia, agnosia and apraxia elicit complex responses and "multimodal impairment",[67] we must rely more clearly on localisation, which has led to more cogent distinctions between general pathological conditions and subgroups within them. One can thus doubt that the holistic approach overemphasises the unitary character of functions that are conversely distinct from one another. For instance, in the case of aphasia, focus is placed on extralinguistic effects, with scarce consideration of the language-specific neural roots of disorders, which are to be differentiated from the motor and muscular damage that hinders the corresponding executive functions.[68] We must consider, besides, that the association of motor and language conditions is due to the proximity of the correlated brain areas, so it has a physical explanation.[69] Furthermore, there are certain kinds of aphasias that do not impact the faculty of representation (phonemic paraphasia).[70] Thus, Làdamas and Berti are clear: we cannot avoid considering the areas affected by impairments and this calls the holistic approach into question.[71]

Another critical example is given when reconsidering the case of ideomotor apraxia. In these circumstances, patients make mistakes if they are asked to perform non-symbolic gestures or imitate actions after having observed them. Hence, no exploitation of the concrete behaviour is automatically pursued. In addition, symbolic actions may be performed normally.[72]

As we move on, we should thus recognise that it is difficult to preserve holism in full. When referring to the painter Chuck Close, who was diagnosed with frontotemporal dementia in 2015, Kandel pinpointed that «the noted painter had radically upended his distinctive style of portraiture – in fact, his entire life».[73] Is aphasia the factor that allowed Close to change his artistic inclinations? The problem is even more striking when one deals with patients who start developing creative capacities only in consequence of the enhancement of the right hemisphere, as a result of damage to the left area. In these situations, is it the pathological state that makes the artist? Perhaps not entirely, but holism is at least called into question since the category of "whole" is not only tied up with a physical substratum, but determined by it.

We can continue on this point by considering that we observe plenty of occurrences that seemingly push us towards the establishment of a general behavioural model, while revealing, in the end, physiological underpinnings. For instance, we

know that in individuals with left brain lesions, impairments and dysfunctions pertaining to motion and language are both present when involving tasks such as denomination, repetition and meaningful gestures.[74] We are also aware both that denomination deficits manifest when objects are presented mostly visually and that aphasia and apraxia are correlated 80% of the time.[75] This suggest that we should proceed carefully when generalising the concept of abstract behaviour.

However, we have seen that holism relates to a general scheme that underlies similar patterns despite the involvement of different cognitive functions. The most important of these models is perhaps the mental capacity for sketching coordinate charts. As I have said, this ability touches a range of fields involving spatial, temporal and mathematical performances. At present, we should hold to the pristine spatialisation of time, which implies homogeneity concerning the description of magnitudes.[76] The hypothesis that the representation of the succession of numbers depends on the existence of the "mental number line", and therefore on a movable frame of reference, seems thus to be confirmed. This is still valid even if we know at present that much more emphasis must be put on localisation. Indeed, recent studies have shown that mathematical skills are especially related to the IPS (intraparietal sulcus), although there are significant overlaps of mathematical and linguistic skills in the Wernicke area and the premotor cortex.[77] In sum, given that different cognitive functions intersect when we describe how a real subject behaves, we should point out that the modern claim for localisation must remain fluid.

Surprisingly, we have yet to define pathology. As on other occasions, it is worthwhile to consider a specific example. Anosognosia is a condition that impacts a complex circuit (areas 6 and 44, primary sensorimotor cortex and insula) that monitors the efficacy of motor programmes and their sensory feedbacks. Impairments may leave the ability to plan actions unaltered, but hinder their actual perception. Therefore, people with anosognosia cannot distinguish programmes from executions: they believe that what they plan is *eo ipso* performed.[78] If we recall that the definition of symbolic behaviour is twofold since it consists of addressing what is present as if it were representative, but also what is representative as present, we may affirm that pathology consists in this case of overemphasising the second part of the statement. Hence, this can be considered as a particular instance of failing in coordination.

There are other unpredictable reversals of this kind. In the case of anomia, for instance, subjects are prone to replacing the missing names with circumlocutions close to the original words. In semantic aphasia, subjects mistake words for correlated terms that follow diverse paths, but never subordination. In short, people in such conditions prevalently replace words with superordinate or coordinate terms. Is this anti-holistic? Not necessarily. Indeed, we may consider that general terms are more often encountered than specific lemmas. In this respect, it is possible that they paradoxically play the role of empirically present particulars, with which subjects may be more familiar. Therefore, we may pinpoint the analogy between integrative agnosia and semantic aphasia since categorial words in the latter may play the role of the shadowed whole in the former.

After long discussion and criticisms, we should nonetheless acknowledge that the most crucial clues in favour of holism are the following: on the one hand, agnosia may cause the impairment of language, as envisaged by Goldstein and Cassirer;[79] on the other hand, no disorder of conceptual thinking is relatable to local damage in the brain.[80] It is too complex to discover lesions that are strictly related to the process of filtering reality through concepts; hence we cannot apply the causal explanatory clause here. Làdavas and Berti write:

> the anatomical-clinical method is not integrally fit for studying the structure of cognitive processes since disorder does not uniquely or exclusively stem from lesions which can be documented through diagnostic tests at our disposal.[81]

In fact, Frommel has emphasised that we must not mistake the knowledge of brain lesions for the knowledge of brain-injured people.[82] Arguably, the only important difference between holism and current research consists of the specification of multiple semantic systems related to the different sensory functions. In this manner, one can explain why a given word can only be recovered through certain sorts of sensations. By way of example, in optic aphasia the visual system of semantic representation is preserved – subjects know what they see –, while the verbal system of semantic representation is not – they cannot verbalise their perceptions.[83] In sum, the more the principle of localisation is endorsed physiologically, the more specification is required when classifying disorders, although we should recognise that isolation is an expedient that conflicts with the multifaceted organism's behaviour.

Present studies have also shown that there are invariants of perception. Invariants are defined as criteria for preserving the identity of objects under geometric transformations. In practice, our brain is endowed with the ability to compare standard representations of objects with their possible changes, as in Cassirer's reference to group theory. If the comparison is compromised, we speak of transformation agnosia. Nevertheless, invariants are equally subject to localisation. For instance, associative agnosia shows that disorders bifurcate

as regards structural and semantic knowledge. Subjects manifest either the incapacity to recognise structural and pre-semantic properties of objects, or categorial dissociations, which are independent of the sensorial presentations of stimuli.[84] But this somewhat confirms Cassirer's distinction between sensitive and symbolic consciousness. It should be mentioned, furthermore, that even in modern empiricist frames of agnosia, perceptions and not sensations are impaired.[85]

Finally, as regards the concept of health, we should conclude that it is not a simple function of the brain. Even if this conclusion does not entail a holistic definition of "mental illness", it is nonetheless plausible to conceive of a general state in which neural and non-strictly physical reasons are interwoven. As I have said, holistic thinkers neither absurdly negated the physiological ground of neuropathology nor did they go beyond a model of the brain functioning. Goldstein even conceived of "psychical" and "physical" attributes as mere labels that depend on the investigation made on the organism. Holism is thus ontologically monistic but epistemologically pluralistic.[86]

Reductionist theories are no exception in this respect. Indeed, Edelman has underscored the importance that "compensatory reactions" have in neuropsychological syndromes and anosognosia. While the typical confabulations of this syndrome seem to arise due to dysfunctions in the orbitofrontal cortex and mediodorsal nucleus of the thalamus,[87] the degree of complexity embodied in each individual's history suggests that «scientific and causal efforts such as drug therapy need to be accompanied by interpersonal exchange».[88]

If we compare this statement with the holistic definition of illness, we see that the personal dialogue between the therapist and the patient compensates for «the inability to stabilise and/or integrate patterns of behaviour into a social framework, leading to a breakdown of different and multiple layers of symbolic formation».[89] Therapeutic actions may thus serve to reinforce proactivity in the adaptation of injured subjects and should accompany medical treatments.[90]

Recent holism-based approaches to neurorehabilitation particularly focused on "task-specific training" given the difficulty of performing abstract tasks: contexts are assigned to patients in advance to exploit their proclivity to concreteness. This can be done, for instance, by involving relatives in the care process, which obviously helps the subjects to feel at ease. In this way, the recovery of abstract capacities remains difficult but achievements are far-reaching. During the process, the therapist observes people in action and supports their adaptation to their possibilities and the environment.[91] All of this happens, while not regardless of localisation, at least as though it were embodied in the wider category of behaviour, in which the functioning of local areas partakes in but does not uncover the "whole".

6 Conclusions

In the first four sections, I outlined the four crucial claims of the holistic approach to neuropathology. First, in modern parlance, the most accurate way of depicting how the brain works is to conceive of a multi-layered scheme, in which the weight of cognitive functions predominates over their brain localisations. That does not mean that localisation is not important, rather that behaviour, and, in particular, abstract and symbolic thought are too complex to be integrally reduced to their neural underpinnings. Second, we have seen that pathology consists of the disentanglement of symbolic schemes and sensitive data. Third, a model in which the weight of cognitive functions is largely predominant also entails the assumption that we find invariants in experience. Fourth, health stems from the adaptation of the organism to its possibilities and environmental factors: in this respect, no distinction between impaired and non-impaired subjects is possible.

In the fifth section, I compared these results to modern research. I have shown that localisation is a more stringent principle. Therefore, we should pay great attention when drawing a general model of abstract behaviour; indeed, it seems appropriate to differentiate between more specific cognitive functions. Nevertheless, there are some conditions that imply behavioural modifications which are not linked to brain lesions. We have also seen that the existence of invariants in perception is plausible and subject to pathological degeneration as well. Furthermore, the relationship between concrete and abstract or symbolic elements has been re-elaborated in more fluid and multifaceted terms, together with the definition of pathology as a lack of coordination concerning symbolic and sensitive consciousness. Finally, I have shown that holism can still bear fruits when the definitions of illness, health and therapy come into play.

Notes

[1] The care of brain-injured people was one of the major issues during the time of Weimar Republic. Historical survey on the organisation of the institute directed by Goldstein, and in general of Goldstein's medical career in Germany, can be found in F.W. STAHNISCH, T. HOFFMANN, *Kurt Goldstein and the neurology of movement during the interwar years*; F.W. STAHNISCH, *Kurt Goldsteins Konzeption der neurologischen „Katastrophenreaktionen" aus heutiger Perspektive*. Cassirer also observed aphasic patients at the Hospital of Barmbek in Hamburg. Cf. E. CASSIRER, *Philosophie der symbolischen Formen. Dritter Teil: Phänomenologie der Erkenntnis*, p. 261, footnote 184 (Eng. Transl., p. 227, footnote 34).

[2] The word "psychopathology" was preferentially used at that time but I have replaced it with the more adequate expression "neuropathology".
[3] K. GOLDSTEIN, *Der Aufbau des Organismus: Eine Einführung in die Biologie unter besonderer Berücksichtigung der Erfahrungen am kranken Menschen*, M. Nijhoff, Den Haag 1934 (Eng. Transl. K. GOLDSTEIN, *The organism: A holistic approach to biology derived from pathological data in man*, American Book Company, New York 1939).
[4] K. GOLDSTEIN, *The organism*, pp. 59-61.
5 *Ibid.*, p. 29.
6 E. CASSIRER, *Philosophie der symbolischen Formen. Dritter Teil: Phänomenologie der Erkenntnis*, p. 231 (Engl. Transl., p. 202).
[7] Truth be told, Goldstein did not share this view since, in his opinion, it presupposed at least a weak dualistic version differentiating the "mind" from "life" (K. GOLDSTEIN, *The organism*, pp. 473-474).
[8] G. GRAHAM, *The disordered Mind*; E.R. KANDEL, *The disordered mind. What unusual brains tell us about ourselves*.
[9] J.M. KROIS, *Ernst Cassirer's philosophy of biology*, p. 290.
[10] N. ANDERSCH, *Symbolic form and mental illness: Ernst Cassirer's contribution to a new concept of psychopathology*.
[11] K. GOLDSTEIN, *The organism*, pp. 250-251.
[12] *Ibid.*, p. 33.
[13] I will limit myself to epistemological remarks but one should consider that holism historically represented an answer to racist and reductionist theories on human nature (cf. N. CHIRIMUUTA, *Cassirer and Goldstein on abstraction and the autonomy of biology*).
[14] K. GOLDSTEIN, *The organism*, p. 121.
[15] *Ibid.*, p. 122.
[16] *Ibid.*, p. 123.
[17] *Ibid.*, p. 28.
[18] *Ibid.*, p. 260, italics in the original.
[19] Regarding injuries in the peripherical system, isolation is conversely more feasible, *ibid.*, p. 259.
[20] *Ibid.*, pp. 22-25.
[21] *Ibid.*, p. 255.
[22] *Ibid*. Of course, this is due to the state of research at that time, when it was largely impossible to study "the anatomical state of the brain" before death.
[23] *Ibid.*, p. 30.
[24] *Ibid.*, p. 31.
[25] S. FRISCH, *Die Suche der Neuropsychologie nach sich selbst*, p. 323.
[26] K. GOLDSTEIN, *Notes on the development of my concepts*, p. 4.
27 K. GOLDSTEIN, *The organism*, p. 18.
[28] K. GOLDSTEIN, *Notes on the development of my concepts,*, p. 12.
[29] *Ibidem.*
[30] K. GOLDSTEIN, *The organism*, p. 32.
[31] K. GOLDSTEIN, *Notes on the development of my concepts*, p. 6
[32] *Ibid.*, p. 7.
[33] *Ibid.*, p. 8.
[34] *Ibid.*, p. 7.
[35] J.M. KROIS (ed.), *Cassirers Briefwechsel*, p. 70.
[36] E. CASSIRER, *Philosophie der symbolischen Formen. Erster Teil: Die Sprache*, pp. 122 and ff.
[37] J.M. KROIS (ed.), *Cassirers Briefwechsel*, p. 80.
[38] *Ibid.*, p. 81.
[39] *Ibid.*, p. 82.
[40] *Ibid.*, 71.
[41] The original German term was "*Zuordnung*", which also referred to the coordination of mathematical structures with physical reality (T. RYCKMAN, *The reign of relativity. Philosophy in physics 1915-1925*, p. 14 et passim).
[42] K. GOLDSTEIN, *The organism*, p. 121.
[43] *Ibid.*, p. 131.
[44] E. CASSIRER, *Philosophie der symbolischen Formen. Dritter Teil*, p. 278, footnote 206 (Engl. Tr., p. 241, footnote 55).
[45] E. CASSIRER, *Philosophie der symbolischen Formen. Dritter Teil*, p. 264 (Engl. Tr., p. 231); H. HEAD, *Aphasia and kindred disorders of speech*, II, pp. 25 and ff.
[46] J. HUGHLINGS JACKSON, *On affections of speech from disease of the brain*; H. HEAD, *Aphasia and kindred disorders of speech*, I, pp. 34-53.
[47] Modularity is not conceived in the Fodorian sense here since Hughlings Jackson's approach is evolutionary: for him, archaic structures are embedded in more recently developed and complex areas. Besides, impairments of the highest layers entail downgrading to former arrangements of the nervous system (cf. E.A. FRANZ, G. GILLET, *John Hughlings Jackson's evolutionary neurology*).
[48] H. HEAD, *Aphasia and kindred disorders of speech,* I, pp. 207-217.
[49] E. CASSIRER, *Philosophie der symbolischen Formen. Dritter Teil*, p. 261, footnote 184 (Engl. Tr., p. 227, footnote 34).
[50] J.J. MAROTTA, M. BEHRMANN, *Patient Schn: Has Goldstein's and Gelb's Case Withstood the test of time?*, p. 634.
[51] Contemporary pedagogical approaches involve the compensation of reading with body movements (A. OLIVERIO, A. OLIVERIO FERRARIS, *Le età della mente*, pp. 104 and ff.).
[52] E. CASSIRER, *Philosophie der symbolischen Formen. Dritter Teil*, p. 275 (Engl. Tr. modified, p. 239).
[53] *Ibid.*, p. 260 (Engl. Tr., p. 226).
[54] Among further experiences taken from Head's patients, which bear witness to this lack of unity, one counts: not being able to reassemble the pieces of a jigsaw (*Ibid.*, p. 278, foot. n. 208, Engl. Tr., p. 241, foot. n. 56); not being able to focus on the whole figure of a lion but only on some parts at a time (*Ibid.*, p. 279, foot. n. 210, Engl. Tr., p. 242, foot. n. 58).
[55] H. HEAD, *Aphasia and Kindred Disorders of Speech*, II, pp. 114-115.
[56] The whole reasoning is exposed in E. CASSIRER, *Philosophie der symbolischen Formen. Dritter Teil*, pp. 294 and ff. (Engl. Tr., pp. 254 and ff.).
[57] *Ibid.*, p. 288 (Engl. Tr., p. 249).
[58] E. CASSIRER, *Substanzbegriff und Funktionsbegriff*, p. 26 *et passim* (Engl. Tr., p. 20 *et passim*).
[59] E. CASSIRER, *Philosophie der symbolischen Formen. Dritter Teil*, p. 289 (Engl. Tr., p. 250).
[60] H. HEAD, *Aphasia and kindred disorders of speech*, II, p. 113.
[61] E. CASSIRER, *The concept of group and the theory of perception*, p. 9.
[62] G. GRAHAM, *The disordered mind*, pp. 7-11.
[63] *Ibid.*, pp. 157-158. G. EDELMAN, *Second nature. Brain science and human knowledge*, p. 107.
[64] J.J. MAROTTA, M. BEHRMANN, *Patient Schn: Has Goldstein's and Gelb's case Withstood the test of time?*, p. 635.
[65] *Ibid.*, p. 636.

[66] *Ibidem.*
[67] B. SCHNEIDER, M. WEHMEYER, H. GRÖTZBACH, *Aphasie: ICF-orientierte Diagnostik und Therapie (Praxiswissen Logopädie)*, chap. 2.
[68] E. LÀDAVAS, A. BERTI, *Neuropsicologia*, p. 161.
[69] In Broca's aphasia, the involvement of the cerebellum leads to disorders concerning higher motor functions, *ibid.*, p. 180. As is known, more generally, the interconnection of the motor and language brain areas has been proved through studies in the field of mirroring systems (*ibid.*, pp. 187-188). This has led to the conception that motion and language are both sequence-based systems: G. RIZZOLATTI, C. SINIGAGLIA, *So quel che fai*; A. OLIVERIO, A. OLIVERIO-FERRARIS, *Le età della mente*, chap. 3. Even in critical perspectives on such systems, the elaboration of a sophisticated computational model encompassing sensory and multimodal systems, as well as top-down codifications of perceptions, speaks in favour of the cooperation of brain areas as determining actual experience (G. HICKOK, *The myth of mirror neurons. The real neuroscience of communication and cognition*, chap. 10).
[70] E. LÀDAVAS, A. BERTI, *Neuropsicologia*, p. 162. In particular, patients know how to represent phonemes without being able to perform them.
[71] *Ibid.*, p. 100.
[72] *Ibid.*, p. 98.
[73] E.R. KANDEL, *The disordered mind*, p. 145.
[74] P. MENGOTTI, *et al.*, *Selective imitation impairments interact with language processing*.
[75] E. LÀDAVAS, A. BERTI, *Neuropsicologia*, p. 100.
[76] Spatialisation depends on the exaptation of neurons from the hippocampus. We navigate through time as though we were navigating through space (D. BUONOMANO, *Your brain is a time machine*, part II, chap. 10).
[77] E. LÀDAVAS, A. BERTI, *Neuropsicologia*, pp. 214-216. However, while endorsing the independence of the parietal lobe, Vallortigara and Panciera have underscored the superposition of language areas when symbolic tasks come into play (G. VALLORTIGARA, N. PANCIERA, *Cervelli che contano*, p. 48).
[78] E. LÀDAVAS, A. BERTI, *Neuropsicologia*, pp. 83-84.
[79] *Ibid.*, p. 167.
[80] *Ibid.*, p. 154.
[81] *Ibid.*, p. 18.
[82] P. FROMMELT, *Kurt Goldstein und Adhémar Gelb: Haben sie eine Aktualität für die heutige Neurorehabilitation und Neuropsychologie?*, p. 362.
[83] E. LÀDAVAS, A. BERTI, *Neuropsicologia*, p. 172.
[84] *Ibid.*, p. 232-236.
[85] G. VALLORTIGARA, *Pensieri della mosca con la testa storta*, p. 101. Nevertheless, against Cassirer, we can notice that in the case of "blindsight" it is conversely possible to have perceptions without sensations (N. HUMPHREY, *A history of the mind. Evolution and the birth of consciousness*, pp. 82-93). It would thus become hard to argue for the univocal direction of the impairment. Nevertheless, blindsight was discovered in 1973 and neither Cassirer nor Goldstein could account for it.
[86] K. GOLDSTEIN, *The organism*, p. 472.
[87] G. EDELMAN, *Second nature. Brain science and human knowledge*, p. 115.
[88] *Ibid.*, p. 122. Furthermore, given the involvement of beliefs, thoughts and system values in the definition of neuroses, we should generally uphold that «every perception is to some degree an act of creation, and every memory is to some degree an act of imagination», *ibid.*, p. 123. Understanding pathology means studying how this degree may change.
[89] N. ANDERSCH, *Symbolic form and mental illness*, p. 193.
[90] *Ibid.*, p. 192. Besides, such a definition encompasses all aspects of pathology as defined by Benini: (1) "illness" as feeling ill, which is independent of organic lesions; (2) "disease" as the objective condition of the patient; (3) "sickness", which refers to the external perception (familiar or social) of the disease (A. BENINI, *Che cosa sono io. Il cervello alla ricerca di sé stesso*, p. 111). Therapy may indeed favour the understanding of one's condition, tone down impairments and foster both personal and social reintegration.
[91] H. GROTZBACH, L. SPITZER, *Was bedeuten aphasische Symptome? Die Position von Goldstein und Gelb*; P. FROMMELT, *Kurt Goldstein und Adhémar Gelb: Haben sie eine Aktualität für die heutige Neurorehabilitation und Neuropsychologie?*, p. 361.

Literature

ANDERSCH, N. (2015). *Symbolic form and mental illness: Ernst Cassirer's contribution to a new concept of psychopathology*. In: J.T. FRIEDMAN, S. LUFT (eds.), *The philosophy of Ernst Cassirer. A novel assessment*, de Gruyter, Berlin/Boston, pp. 163-198.

BENINI, A. (2009). *Che cosa sono io. Il cervello alla ricerca di sé stesso*, Garzanti, Milano.

BUONOMANO, D. (2017). *Your brain is a time machine. The neuroscience and physics of time*, Norton, New York.

CASSIRER, E. (1910). *Substanzbegriff und Funktionsbegriff*, Bruno Cassirer, Berlin (English translation: E. CASSIRER, *Substance and function and Einstein's theory of relativity*, translated by W.C. SWABEY, M.C. SWABEY, Open Court, Chicago 1953).

CASSIRER, E. (1944). *The concept of group and the theory of perception*. In: «Philosophy and Phenomenological Research», vol. V, n. 1, pp. 1-36.

CASSIRER, E. (2010). *Philosophie der symbolischen Formen. Erster Teil: Die Sprache* (1923), Meiner, Hamburg.

CASSIRER, E. (2010). *Philosophie der symbolischen Formen. Dritter Teil: Phänomenologie der Erkenntnis* (1929), Meiner, Hamburg (English translation: E. CASSIRER, *Philosophy of symbolic forms*, Translated by R. MANHEIM, Yale University Press, New Haven and London 1957).

CHIRIMUUTA, M. (2020). *Cassirer and Goldstein on abstraction and the autonomy of biology*. In: «HOPOS. The Journal of The International Society for the History of Philosophy of Science», vol. X, n. 2, pp. 471-503.

EDELMAN, G.M. (2006). *Second nature. Brain science and human knowledge*, Yale University Press, New Haven/London.

FRANZ, E.A., GILLET, G. *John Hughlings Jackson's evolutionary neurology: A unifying framework for cognitive neuroscience*. In: «Brain», vol. CXXXIV, pp. 3114-3120.

FRISCH, S. (2015). *Die Suche der Neuropsychologie nach sich selbst*. In: «Neurologische Rehabilitation», vol. XXI, n. 6, pp. 317-326.

FROMMELT, P. (2015). *Kurt Goldstein und Adhémar Gelb:*

Haben sie eine Aktualität für die heutige Neurorehabilitation und Neuropsychologie?. In: «Neurologische Rehabilitation», vol. XXI, n. 6, pp. 353-363.

GOLDSTEIN, K. (1963). *The organism: A holistic approach to biology derived from pathological data in man* (1939), Beacon, Boston (Original edition: K. GOLDSTEIN, *Der Aufbau des Organismus: Einführung in die Biologie unter besonderer Berücksichtigung der Erfahrungen am kranken Menschen*, M. Nijhoff, The Hague 1934).

GOLDSTEIN, K. (1971). *Notes on the development of my concepts* (1959). In: A. GURWITSCH, E.M. GOLDSTEIN HAUDEK, W.E. HAUDEK (eds.), *Kurt Goldstein. Selected papers/Ausgewählte Schriften*, M. Nijhoff, The Hague, pp. 1-12.

GRAHAM, G. (2021[3]). *The disordered mind*, Routledge, Oxon/New York.

GRÖTZBACH, H., SPITZER, L. (2015). *Was bedeuten aphasische Symptome? Die Position von Goldstein und Gelb*. In: «Neurologische Rehabilitation», vol. XXI, n. 6, pp. 330-336.

HEAD, H. (1926). *Aphasia and kindred disorders of speech*, 2 voll., Cambridge University Press, London.

HICKOK, G. (2014). *The myth of mirror neurons. The real neuroscience of communication and cognition*, Norton, New York.

HUGHLINGS JACKSON, J. (1878-1879). *On affections of speech from disease of the brain*. In: «Brain», vol. II, n. 3, pp. 323-356.

HUMPHREY, N. (1992). *A history of the mind. Evolution and the birth of consciousness*, Simon & Schuster, New York.

KANDEL, E.R. (2018). *The disordered mind. What unusual brains tells us about ourselves*, Robinson, London.

KROIS, J.M. (2004). *Ernst Cassirer's philosophy of biology*. In: «Sign Systems Studies», vol. XXXII, n. 1-2, pp. 277-295.

KROIS, J.M. (2009). *Cassirers ausgewählter wissenschaftlicher Briefwechsel*, Bd. XVIII, Meiner, Hamburg.

LÀDAVAS, E., BERTI, A. (2020). *Neuropsicologia*, Il Mulino, Bologna, IV edition.

MAROTTA, J.J., BEHRMANN, M. (2004). *Patient Schn: Has Goldstein's and Gelb's case Withstood the test of time?*. In: «Neuropsychologia», vol. XLII, n. 5, pp. 633-638.

MENGOTTI, P., CORRADI-DELL'ACQUA, C., NEGRI, G. A.L., UKMAR, M., PESAVENTO, V., RUMIATI, R.I. (2013). *Selective imitation impairments interact with language processing*. In: «Brain», vol. CXXXVI, n. 8, pp. 2602-2618.

OLIVERIO, A., OLIVERIO FERRARIS, A. (2018). *Le età della mente*, BUR, Milano, III edition.

RIZZOLATTI, G., SINIGAGLIA, C. (2006). *So quel che fai. Il cervello che agisce e i neuroni specchio*, Cortina, Milano.

RYCKMAN, T. (2005). *The reign of relativity. Philosophy in physics 1915-1925*, Oxford University Press, New York.

SCHNEIDER, B., WEHMEYER, M., GRÖTZBACH, H. (2021). *Aphasie: ICF-orientierte Diagnostik und Therapie (Praxiswissen Logopädie)*, Springer, Cham, VII edition.

STAHNISCH, F.W., HOFFMANN, T. (2010). *Kurt Goldstein and the neurology of movement during the interwar years*. In: C. HOFSTADT (Hrsg.), *Was bewegt uns? Menschen im Spannungsfeld zwischen Mobilität und Beschleunigung*, Projekt Verlag, Bochum/Freiberg, pp. 283-311.

STAHNISCH, F.W. (2015), *Kurt Goldsteins Konzeption der neurologischen „Katastrophenreaktionen" aus heutiger Perspektive*. In: «Neurologische Rehabilitation», vol. XXI, n. 6, pp. 337-346.

VALLORTIGARA, G., PANCIERA, N. (2014). *Cervelli che contano*, Adelphi, Milano.

VALLORTIGARA, G. (2021). *Pensieri della mosca con la testa storta*, Adelphi, Milano.