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Perceptual Anomalies in Schizophrenia: Integrating Phenomenology and Cognitive Neuroscience

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From phenomenological and experimental perspectives, research in schizophrenia has emphasized deficits in "higher" cognitive functions, including attention, executive function, as well as memory. In contrast, general consensus has viewed dysfunctions in basic perceptual processes to be relatively unimportant in the explanation of more complex aspects of the disorder, including changes in self-experience and the development of symptoms such as delusions. We present evidence from phenomenology and cognitive neuroscience that changes in the perceptual field in schizophrenia may represent a core impairment. After introducing the phenomenological approach to perception (Husserl, the Gestalt School), we discuss the views of Paul Matussek, Klaus Conrad, Ludwig Binswanger, and Wolfgang Blankenburg on perception in schizophrenia. These 4 psychiatrists describe changes in perception and automatic processes that are related to the altered experience of self. The altered self-experience, in turn, may be responsible for the emergence of delusions. The phenomenological data are compatible with current research that conceptualizes dysfunctions in perceptual processing as a deficit in the ability to combine stimulus elements into coherent object representations. Relationships of deficits in perceptual organization to cognitive and social dysfunction as well as the possible neurobiological mechanisms are discussed.

Key words: schizophrenia/phenomenology/perception/Gestalt psychology/delusions/automatic processes/cognitive deficits

Introduction

Recent theoretical and empirical work indicates renewed interest in the systematic study of subjective experience in psychopathology and the cognitive sciences.[1,2] The change of emphasis may be, in part, a reaction to the prevailing orientation of psychiatric research that almost exclusively focuses on biological and cognitive mechanisms at the expense of systematic studies of subjective experience. Despite progress in identifying the putative cognitive endophenotypes and neural substrates of schizophrenia, phenomenology is at the center of any effort to investigate psychopathology because it makes accessible the subjective sphere, the symptoms reported by the patient.[3]

When applied to psychiatry, phenomenology has been used within a variety of contexts and quite frequently with connotations that are contradictory to its original meaning. Founded by Edmund Husserl (1859–1938), phenomenology emphasizes the primacy of human experience and its direct lived quality, which is irreducible to explanations provided by the natural sciences. It has a long-standing tradition in psychiatry, although the precise meaning and its application are themselves subjects of debate (see review in Spitzer and Uehlein[4]). In the present context, phenomenology, as applied to the study of psychopathology, is used as a descriptive account of the signs and symptoms of the patient with the following characteristics: (1) descriptive empirical, (2) detailed, (3) individualistic, (4) subjective, (5) antireductionistic, and (6) atheoretical[4] (see the appendix for further discussion of phenomenology and its methods). Current usage of the term *phenomenology* in psychiatric research refers to clinical description without concern for underlying neurobiological mechanisms. However, this view is misleading. While phenomenology is "atheoretical" in method and suspends any assumptions about causality in terms of levels of explanation, its "results" provide a rich theoretical framework about how subjective experience is organized and how this organization may be disrupted in psychiatric disorders. As we hope to demonstrate in this review, this leads to very specific, testable hypotheses about the underlying neurobiology.

Phenomenological investigations in psychopathology have recently conceptualized schizophrenia as a disorder of self-experience in which the core pathology resides in

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an excess of rationality and reflectiveness.[5] This notion is paralleled by neuropsychological theories that have also emphasized "higher" cognitive processes. Because patients with schizophrenia have difficulty in making explicit inferences about theory of mind (ToM) as well as other aspects of self-monitoring, Frith, for example, labels the disorder "a disorder of consciousness" or "meta-representation,"[3,6] ie, an impairment in the ability to consciously reflect about mental states in self and others.

In contrast, little attention has been paid to a less known approach in the phenomenological tradition. This approach emphasizes that perceptual anomalies provide the basis for changes in the continuity of the experience of self and the development of other symptoms of the disorder, especially in prodromal and beginning schizophrenia. Starting in the middle of the last century, phenomenological literature (predominantly German) described changes in the perceptual or experiential field (Matussek,[7–9] Conrad,[10] Binswanger,[11,12] Blankenburg[13,14]) that are related to the emergence of delusions in schizophrenia.

The relevance of disturbances in the perceptual field has been supported by research in experimental psychopathology and cognitive neuroscience that has examined perceptual processing in schizophrenia.[15,16] These efforts have come to the conclusion that perceptual processing represents an important target for further research and for the understanding of the pathophysiology of schizophrenia. In the light of these findings, we provide a comprehensive account of the perceptual field emphasizing both phenomenological perspectives and the research in cognitive neuroscience.

Phenomenology of the Perceptual Field in Schizophrenia

For Kraepelin[17] and Bleuler,[18] disturbances in visual perception were considered relatively unimportant compared with features such as thought disorder or delusions, which dominated the clinical presentation. For example, Kraepelin indicated, "[P]erception of external impressions in dementia praecox is not usually lessened to any great extent as far as a superficial examination goes."[17(p5)] This position was echoed by Bleuler, who wrote, "Sensory responses to external stimulus are quite normal. To be sure, the patients will complain that everything appears to be different. However, this strangeness is usually attributable to a deficit in customary associations and particularly to an alteration of emotional emphasis."[18(p76)] In contrast, the works of Matussek, Conrad, Binswanger, and Blankenburg identified prominent alterations of perception in schizophrenia. While each of the authors places somewhat different emphasis on the levels of organization of perceptual experience or on the mechanism responsible for deformation of the Gestalt in its perceptual context, a common theme is that the perceptual field undergoes both pervasive and subtle changes in organization in schizophrenia.

Based on these views, we propose that certain symptoms of schizophrenia, such as delusions, can be approached as a response to the threat to the patient's being-in-the-world, ie, *the sense that one exists* and continues to exist from moment to moment. (Conrad[19] [for discussion, see Mishara[20]] proposes that the conviction that one exists draws from sensations and impressions as they arise from perceptual and bodily experience. Although arising subpersonally, it is at the root of the most personal sense of self: the perception of our own bodies as existing that Conrad calls "coenesthesis, or coenesthesia [*Gemeingefuehl*]." For the history of this term, see Fuchs.[21]) This sense of threatened existence may rest on anomalies of perceptual processing that emerge early in the course of illness. Phenomenological thinkers often emphasize that our sense of being in, or connected to, a world is based on a fundamental primacy of perception in our cognitions.[24] (Consistent with phenomenological theory, current approaches to perception in cognitive neuroscience do not consider perception to be a passive process that delivers a static internal world model but as strongly influenced by prior knowledge and expectations that interact with the incoming sensory input at all stages of processing.[22] From this perspective, perception is intimately related to action [see von Weizsaecker[23]].) Therefore, changes in the organization of the perceptual field may very well have wider relevance for the understanding of the experience of self and certain symptoms that are generally attributed to higher cognitive functions.

Despite the foundational character of perception, some authors who endorse a phenomenological approach toward psychopathology support the view that perceptual processes are not relevant for the understanding of schizophrenia. For Jaspers, delusional interpretations of perception (called delusional perceptions) and primary delusions are pathognomic and often indicate beginning schizophrenia. Following this, the classical school of descriptive psychopathology (Jaspers, Gruhle, Schneider) proposed that the delusional perceptions often reported in beginning schizophrenia are essentially 2 tiered: an abnormal meaning attaches to an otherwise intact perception without understandable reason or cause (in Gruhle's[25] terms, *ohne Anlass*). For Jaspers, "delusions can only arise in the process of thinking and judging."[26(p95)] Following Jaspers, Schneider states that delusional perception (*Wahnwahrnehmung*) refers to "the abnormal significance attached to a real percept." It "mostly tends towards self-reference and is almost always of a special kind: it is momentous, urgent, somehow filled with personal significance as, for example, a particular sign or a message from another world."[27(p33)] Although not specific to schizophrenia, the *delusional percept* is a first-rank symptom. "It is a 2-stage phenomenon consisting

Table 1. Phenomenology of the Perceptual Field in Schizophrenia

Patient 1: She remembered that she could not look at the whole door. She could only look at the knob or some corner of the door. The wall was fragmented into parts.[105(p85)]
Patient 2: I may look at the garden, but I don't see it as I normally do. I can only concentrate on details. For instance, I can lose myself in looking at a bird on a branch, but then I don't see anything else.[9(p92)]
Patient 3: Everything I see is split up. It's like a photograph that's torn in bits and put together again. If somebody moves or speaks, everything I see disappears quickly and I have to put it together.[106(p29)]
Patient 4: It's the same with listening. You can hear snatches of conversation and you can't fit them together.[46(106)]

of normal perception followed by a highly personalized interpretation of that perception."[28(p29)]

In contrast to these views, an alternative position in phenomenological psychopathology considered disturbances in the perceptual field as fundamental to the understanding of the condition and its symptoms. In direct response to Schneider's claim that the percept is intact in delusional perception, Matussek[7,9] observed that the perceptual field in patients with schizophrenia is characterized by a "loosening" of the visual context. Conrad[10] incorporated Matussek's insights to propose that perceptual anomalies form an important symptom of early schizophrenia and proposed a stage model that included the development of delusions. Binswanger[11,12] also proposed a stage model but suggested that a loosening of the perceptual schema (or the internal structure of the object, see appendix) was responsible for the separation of perceptual fragments from their experiential context. The noncontextualized fragments or saliencies are reorganized in the formation of delusions. Blankenburg[13,14] suggested that the disruption of the experiential context reflected a *loss of common sense* and—elaborating on Binswanger[11]—that the delusional themes related to these initial perceptual abnormalities became independent from their context in the patient's life history. (These later phenomenological authors opposed the strict methodological alternative of "*explanation*" vs *understanding* maintained by the *classical* psychopathology of Jaspers and his followers. *Fin-de-siecle* efforts to systematically study human beings, including Jaspers' *General Psychopathology*,[26,29] inherited the 19th century division: *human sciences* [*Geisteswissenschaften*, the German translation of J.S. Mill's *moral sciences*], which are based largely on the understanding of the connections between historical events, vs *Naturwissenschaften* [the natural sciences], which find causal explanations between postulated *natural* entities. Guided by this dualism, Jaspers[26,29,30] made the oft-cited claim that schizophrenia cannot be *understood* as a development of personality but can only be *explained* in terms of an unknown "biological process." Phenomenology provided a third way out of this dilemma for the 4 authors described in this review by defining an initially theoretically neutral study of subjectivity. Following this, hypotheses about the underlying neurobiology may then be experimentally studied.)

Reduction of the Gestalt Character of the Perceptual Field in Schizophrenia

Following the work of the Gestalt psychologists, Wertheimer[31] and Metzger,[32] Matussek proposed that changes in visual perception in schizophrenia are closely related to the loosening of individual perceptual components from their natural context. Whereas the normal visual field is characterized by coherence, in which objects are perceived in meaningful relationships to one another, this coherence appears to be reduced in schizophrenia (table 1). Matussek[9] provided a real-world example to contrast perceptual organization in schizophrenia from the normal perception of a visual scene. He described a railway station in which a group of people, a train arriving, and a kiosk are present. Although these objects are salient elements of the visual scene, there is nevertheless an inherent organization between them. This results from their "embeddedness" in the overall scene of the railway station. The directly perceived phenomenal organization is evident when an incongruous element is imagined (eg, a writing desk on the rails), which immediately causes surprise.[9(p91)] In this view, the loosening or splitting of visual context would lead to the perception of individual elements of a scene but without necessarily grasping their natural relationships (and therefore the scene's overall meaning).

The patients' reports (in table 1) indicate that disturbances of perception occur at varying levels of organization. Thus, the report of patient 2 suggests that the coherence between objects in the perceptual field is loosened so that a single object is not perceived as part of a larger scene but is experienced as an isolated part. In contrast, the description of patient 3 indicates a more pervasive disturbance in which not only the organization or the context between objects is loosened but also the objects themselves appear disintegrated. This is consistent with Matussek's observation that the degree of fragmentation of the perceptual field is dependent on the severity of the psychosis.[9(p91)]

In addition to disrupted perceptual organization, Matussek emphasizes the emergence of accentuated perceptual qualities that seem to stand out from a diminished background. Following Gestalt theory,[32] Matussek differentiated those holistic perceptual qualities (*Ganzeigenschaften*) that give objects their expressive character (*Ausdruckseigenschaften*) from other qualities, such as the object's structure (*Gefüge*) or its physical composition (*Beschaffenheit*). He postulated that altered perceptual experiences are mainly the result of accentuation of the object's *expressive* qualities. For example, a patient

is impressed by the wild, primordial nature of a howling dog at a country farm. Shortly thereafter, he is struck by the same natural, untamed qualities in the jumping of a young horse in a fenced enclosure. Soon the entire landscape takes on this primordial, wild quality, and the patient is no longer certain whether he is still in Bavaria or returned to his childhood home in Silenia.[7(pp290–291)] In this early phase of delusion, the patient experiences the saliency of the expressive aspects of the objects apart from their natural contexts (ie, the farm or the enclosure). Moreover, the emergent delusion provides the elaboration of a new context for the unexplained increased salience of the dislocated, decontextualized expressive perceptual qualities.

Perceptual Field, Self-Experience, and Common Sense in Schizophrenia

Through the organization of the perceptual field, the individual is connected "prereflectively" to the world (ie prior to any explicit thought), which serves as the basis for his action and cognition.[33] In schizophrenia, we can observe how the gradual loosening of the perceptual context is related to a number of secondary changes, including the loss of a sense of continuity and an ability to act effectively in the seemingly changed environment. Moreover, delusions may provide new elaborative contexts to understand the dislocated or overly salient perceptual fragments.

Whatever meaning perceptual objects may have for us depends on the initial integrity of the perceptual field. To the extent that this organization is lost, there follows a radically changed perception of meaning. That is, objects lose their significance or what has been called their *affordances*.[34] This could include their significance as obstacles, tools, objects of desire, and the like (table 2, patients 5 and 6) that may be related to the reduction of the inherent organization of perceptual data. Koehler expresses this relationship as follows: "It is precisely the original organization and segregation of circumscribed wholes which make it possible for the sensory world to appear so utterly imbued with meaning … in its gradual entrance into the sensory field, meaning follows the lines drawn by organization."[35(pp115–116)]

Parallel to the erosion of perceptual organization in psychosis, a separation emerges between the self and its perceptual field. In the normal course of experience, the self and the perceptual field are not experienced as two opposing poles but as an indivisible whole in which self and world appear in relation to one another. This does not mean that the ego and the perceptual field create a unity, but rather, a circularity exists between the perceiving subject and its perceived world, in which the world exists for the subject and gets defined in relation to it.[23] To a certain extent, this circularity can be bracketed or temporarily suspended through a reflective stance in which the self views the perceptual field from a distance. It is as if one thought or said to oneself: On the one hand, "I find myself outside of this relationship," but on the other hand, "I find myself once again in a temporal relationship to its contents (in the nonceasing flux of consciousness) which I reflectively describe from this newly instituted meta-perspective."

In schizophrenia, the relationship between perceiving subject and world is radically altered. Self and world appear as separate and disconnected. A prevailing view in the current phenomenological literature is that our usual

Table 2. Phenomenology of Common Sense and Self-Experience in Schizophrenia

Patient 5:	I only saw fragments: a few people, a dairy, a dreary house. To be quite correct, I cannot say that I did see all that, because these objects seemed altered from the usual. They did not stand together in an overall context, and I saw them as meaningless details … My impressions did not flow as they normally do. If I had not continuously reminded myself where I was going, I would just as gladly have stood still somewhere.[9(p92)]
Patient 6:	My eyes met a chair, then a table; they were alive, too, asserting their presence. I attempted to escape their presence, with its existence. I attempted to escape their hold by calling out their names. I said, "chair, jug, table, it is a chair." But the words echoed hollowly, deprived of all meaning, it had left the object, was divorced from it, so much so that on one hand it was a living, mocking thing, on the other, a name, robbed of sense, an envelope emptied of content.[107(pp40–41)]
Patient 7:	A schizophrenic patient reported after his psychosis had subsided that his attention had been attracted by the gently swinging cord of a light switch on the wall. He had failed to notice that the cord had been touched by someone else before. "What on earth is that?" he thought. He stared at the cord on the wall. Even when turning his head from all sides, his eyes remained fixed on the cord. And suddenly he had the impression that it was not the cord which was moving to and fro, but the wall. He then concluded that the end of the world had come.[9(p93)]
Patient 8:	What is it that I am missing? It is something so small, but strange, it is something so important. It is impossible to live without it.… Every person knows how to behave, to take a direction or think something specific.… I am missing the basics … it does not work for me … Each thing builds on the next … I don't know what to call this … It is not knowledge … Every child knows these things![14(p308)]
Same patient:	It is just a matter of mere feeling, sensing what is appropriate. One has this from nature … It is such a strange feeling, when one doesn't know the simplest of things.[14(p308)]
Patient 9:	Your experience of protection and security, your being unburdened or your happiness are indebted to something in relation to which you are barely conscious. It is this something which enables the being unburdened as well as these other things. It is what forms the first foundation. Letter addressed "to a stranger."[14(p308)]

Table 3. Phenomenology of the Perceptual Field and Delusions

Patient 10:	Out of these perception came the absolute awareness that my ability to see connections had been multiplied many times over.[9(p96)]
Patient 11:	I had very little ability to sort the relevant from the irrelevant. The filter had broken down. Completely unrelated events became intricately connected in my mind.[108(pp175–176)]

embeddedness in the world dissolves in a reflective stance from which the self views the world as a distant observer (as if "from above"). In this view, hyperreflective forms of awareness or hyperconcentration predominate in schizophrenia, and aspects of self are experienced as akin to external objects.[36] This formulation builds upon previous phenomenological thinking that the fundamental disturbance in schizophrenia is a loss of the *vital contact* or connection with reality.[37] In contrast to these approaches that claim that fragmentation and destruction of the self come from above by means of an excess of rationality or hyper "self-consciousness,"[5] we believe that these complex phenomena (eg, feelings of unbridgeable alienation between self and world, the fragmentation of experience, a compromised sense that one exists at all, and, to a certain extent, impairment of higher cognitive functioning) have their origin "below" in a disruption of perceptual processing.

The 2 phenomenological approaches to psychopathology, *hyperreflexivity* and *disrupted perceptual/automatic processing*, are nevertheless not mutually exclusive. Matussek[7–9] discusses the relationship between changes in the perceptual field and what may be called hyperreflective forms of awareness, ie, "how the perception of an object can change simply as a result of prolonged gazing."[9(p94)] As a consequence of the loss of the perceptual Gestalt, he observes that patients have the tendency "to loose themselves" in its particular details. The patient may inspect an isolated object or its seemingly "meaningless details" for protracted periods as a result of its increased "perceptual rigidity." The patient may inspect isolated aspects of the visual field without grasping the meaningful relationships that emerge between objects. Objects appear as framed or "weighted," as separated from their background, which, in turn, causes them to seem strange or hypersignificant.[9(pp93–94)] This is evident in the description by patient 7 who reports being "captured" by a swinging cord. Because of the failure to take into account the surrounding context, the swinging cord, which was moved by a different person, is suddenly transformed to its background, a moving wall. Matussek's[7–9] proposal of an inability to *detach* a captive attention from salient perceptual aspects, however, may be more parsimonious than the additional claim that "concentration" or reflective processes themselves increase in schizophrenia (ie, hyperawareness, hyperreflexivity)[5] for which there is little or no apparent experimental support.

Disruption of perceptual organization leads to an increased sense of distance not only to objects and the surrounding world but also to others, the *social* environment. Drawing from the eloquent reports of his patients, Blankenburg[13,14] attributes the patient's distance from the social world and increased sense of isolation to a "loss of common sense." (table 2, patients 8 and 9). As can be seen from the patients' statements, the distance between self and world as a breakdown in the perceptual field indicates that it is also a social world from which the patient feels so immeasurably distant. There is an accompanying loss of goal-directed behavior and a sense of how to behave appropriately in situations. What patient 8 reports slipping away from her are the "simplest of things": how to behave in certain situations, how to dress, how to grapple with everyday problems, how to speak with people one meets, or what one is supposed to think. She is painfully aware that she draws a blank on what comes simply and *automatically* to others.

Despite its importance, common sense is hard to characterize. As patient 8 states, "it is something so small," but impossible to live without. Patient 9 writes that it is largely nonconscious but forms the foundation for everything else. We take it for granted, and when we try to define it, it becomes slippery and escapes our grasp. It functions best when its matter-of-factness is accepted without further reflection. Blankenburg[14] proposes that this is the case because the "resistance" to losing our common sense preserves our mental health. The resistance functions precisely by "overlooking" (von Weizsaecker[23]) the obvious. As "obvious," it does not require further exploration. Common sense is the way that past experience, as it concerns social or practical matters, implicitly informs our current perceptions of situations. It provides the implicit context for current experience. Blankenburg writes, "The healthiness of common sense rests on habituality."[14(p305)] If it is absent, as in our patients, and one demands certitude in the proper domain of the merely probable, then one attempts to construct with controlled effortful processing what is available to others as a matter of "subtlety of feeling," ie, what is intersubjectively acceptable, tactful, or dictated by convention but not accessible to direct rational analysis. Following Husserl,[38] Blankenburg calls this the "prepredicative (or pre-lexical) realm of meaning" (ie, what we describe in the appendix as the passive automatic subcomponents of intentionality), which connects self and world and *allows past meanings to contribute unobtrusively to current perceptual experience* (ie, without explicit, linguistic mediation). It automatically provides the appropriate and pragmatic way of behaving that somehow "hits the mark" for the current situation without explicit judgment or deliberation (for experimental support, see Dijksteruis[39]).

Reorganization of the Perceptual Field and the Development of Delusions

The previous section provided support for the view that the perceptual field in schizophrenia is characterized by a reduction in organization that leads to a distancing between self and world. It was briefly suggested that delusions provide new elaborative contexts to understand the dislocated or overly salient perceptual fragments. In addition to reduced perceptual organization or context and the increased saliency of perceptual aspects, there sometimes follows something entirely new that contributes to the development of delusions: the restructuring of the perceptual field in response to the perceptual fragmentation.

It was von Weizsaecker[23] who developed the concept of perceptual restructuring. Summarizing the findings of contemporary Gestalt experiments, he proposed that under duress or disturbance to our perceptual organization, we spontaneously and effortlessly apply "strategies" that preserve the coherence of the perceptual field as a totality as much as this is possible. It is a totality that includes the embedded subject. Therefore, *the continued existence of the subject appears to depend*, in part, *on the preserved coherence of the perceptual field*. The coherence is maintained by sacrificing some features while preserving others. For example, the whir of a propeller blade occurs at such speeds that we are no longer able to perceive the individual blades. In this case, the integrity of the perceptual Gestalt is disrupted by movement. The disturbance to our perception, however, is limited by the fact that the individual blades appear to fuse. Critically, *we do not take these changes "seriously*." The spontaneous emergence of a new organization assigns functional significance of each part to every other part by setting the conditions for each locus in maintaining inner coherence of the system.[40] The strategies to maintain coherence by reorganizing preserved and sacrificed aspects are not consciously generated but appear to emerge effortlessly and automatically in the service of preserving the self-world relationship as coherently meaningful. These transitions in perceptual organization are rapid and ballistic in that each new organization appears to emerge on its own without precedent in the prior organization.

For each of the 4 authors we discuss, delusions in early schizophrenia result in one way or another from the reorganization of the perceptual field. Following von Weizsaecker,[23] Conrad,[10] and Binswanger[11,12] propose discrete stages of spontaneous but compromised reorganization of the perceptual field in which the self attempts to preserve contact with the environment but with ever increasing distortions due to the underlying neurobiological disease.

How then do delusions emerge from the compromised Gestalt organization of perceptions? We present one of Binswanger's[11,12] cases that exhibits his model of stages leading to the formation of delusions in acute psychosis. The patient, Suzanne Urbanne (pseudonym), learns from an urologist that her husband is diagnosed with cancer. The way that she learns about the cancer upsets and preoccupies her: "Meanwhile, the urologist turns his back to my husband. He gives me a hopeless grimace. I become stiff, my mouth falling. He presses my hand to warn me that I should be careful not to let my feelings show to my husband. It was this insincere gesture which was the most horrible."[11(p383)] In the period that follows, Suzanne manages the concerns regarding her husband's illness with "unbelievable energy." However, she begins to talk with herself, is barely sleeping, and refuses to discuss any topics other than her husband's illness. In the emergent *delusional atmosphere*, she reexperiences the "hopeless grimace of the doctor," which provides the content for subsequent delusional elaboration in her beginning schizophrenia. Binswanger[12] describes how one perceptual aspect (*Abschattung*) (in this case, the doctor's grimace) becomes exaggerated and separated from its background. This occurs in a process of loosening of the delusional theme from its life-historical embeddedness (*die Verselbstaendigung eines Themas zum Wahn*). As the theme becomes the patient's exclusive focus, the patient shifts to a more passive attitude and becomes—not unlike Conrad's stage, *Trema*—the center or object of a "delusional theater or stage" (*Wahnbuehne*). (Conrad[10] labeled the first phase of beginning schizophrenia Trema [from ancient Greek for hole, orifice] to indicate the oppressive feelings that he likened to "stage fright" in the predelusional state.) Suzanne is now convinced that not only is it the doctor who wants to "martyr her family." The "delusional schema" of his insincere hopeless facial expression (now separated from the original scene of its occurrence) generalizes to (anonymous) others: "the police are martyring her entire family." Her previously frantic activity during the prodromal delusional atmosphere evolves into an ever more passive attitude of resignation. Still "others" have the ability to listen in on the patient's conversations from afar by means of unknown, technical devices (a frequently reported delusion).[41] The sounds of "paper crinkling" in a nearby room indicate to her that her thoughts are simultaneously stenographed. Hidden wires under the earth transmit electricity to her body. The patient sees an ordinary "scythe" and is certain it will be used to martyr her family (ie, a delusional perception). Threat appears to issue "atmospherically" from the perception of the scythe.

In beginning schizophrenia, the patient may have an agitated mood with the feeling that something very special or terrible is about to happen but is unable to say what this might be (ie, delusional atmosphere or mood [*Wahnstimmung*]). There is a disturbance to the natural course or continuity of experience. As Matussek[7] had emphasized, certain features or fragments of experience start to stand out over others. These aspects are no longer

synthesized in the continuum of natural experience. They leave "gaps" and appear not to occur in ordinary time.[11,12] The nontemporalized, impressional fragments or partial aspects of perceptual objects collect and start to coincide structurally or in terms of one "physiognomic" expressive feature (eg, the intent to martyr). Suddenly, from out of the fragments, the patient has an *Aha-Erlebnis*, a sudden insight into the situation. This relieves the increasing distress due to the fragmentariness or gaps in the natural successive organization of this experience in time. The seeming "insight" of the delusion imposes a retroactive organization on the collected, nontemporalized fragments. *The perceived coincidences seem to restore an illusory continuity of experience*. As in dreaming, objects are accepted as meaningful or complete when viewed from only one side or perspective, ie, in terms of the immediate expressive aspect originally given in sensory awareness; these less complete fragments are then given "ready-made" to conscious thought as if they were fully constituted objects and could be imparted in a manner that others would be able to understand. That is, *delusions do not develop exclusively in the context of higher cognitive processes* (eg, explicit judgments, thoughts, and beliefs), as proposed by Jaspers and his followers, but rather also involve a disturbance in the perceptual and passive, automatic processes whereby our experience first comes to unity. The delusional "object" (eg, the martyring scythe, invisible devices or powers that control one's thoughts and actions) is not fully constituted in perception or conscious judgment but remains an incomplete saliency or partial object that is elevated to the epistemological status of an entire or complete object "pregiven" with the presumptive "evidence" of world experience.[12,42] Similarly, Blankenburg suggests that delusions may arise from a loss of *trust* in the continuity of experience and the underlying automatic processes of perceptual meaning (eg, common sense) that support this sense of continuity.[43] Following Matussek, Blankenburg proposes (paradoxically) that it is "not pathological belief but a pathological absence of belief that is fundamental to the formation of delusions."[13(p7)]

Binswanger's description of phases exhibits his existential approach. Influenced by von Weizsaecker,[23] Sartre,[44] and other existentialist thinkers, Binswanger believes that the human being is "condemned" to an ongoing process of self-transcendence or openness to the unknown future that, although in part anticipated, displaces his current perspective. The initial perceptual disturbances of deformation of Gestalt perception in early schizophrenia are the initial phases of the loss of this ability of self to transcend its own experience. This is in part due to a changed experience of time. Not unlike reported experiences of dreaming, the subject is confined to his current impressions and perspective at the present moment.[11,45] The resulting inability to detach attention from the emergent decontextualized perceptual saliencies may be related to an inability to not take such perceptual disturbances seriously, ie, to be unable to overlook them.[23]

Ludwig Binswanger's views on the development of delusions and its relationship to changes in perceptual organization have a striking parallel to those advocated by Paul Matussek and Klaus Conrad. The inability to transcend the immediate physiognomic impressions (or Matussek's expressive features) of current experience is also emphasized in Conrad's phases of apophany and anastrophe.[10] As already noted, Matussek describes the phenomenon of the elaboration of "morbid context" due to perceptual fragmentation (reported by patient 5).[9(p96)] As perceptual organization becomes disrupted, the patient sees new relationships based on an idiosyncratic interpretation of the changed world (table 3, patients 10 and 11). According to Conrad[10] the development of delusional perception (the apophanous phase in Conrad's terminology) can be subdivided into 3 phases. In the first phase, the object indicates to the person that it has significance for him, but he cannot say to what extent. Here, the loosening of perceptual context is only minimal, and the perceptual qualities are only subtly pronounced. In the second phase, the object has an immediate significance for the person. During this phase, a marked loosening of perceptual context occurs, and specific perceptual qualities are exaggerated. In the third phase, the person perceives an object to have a very specific meaning for him, and there is an increasingly loosened perceptual context along with the increased emergence of perceptual qualities. This constitutes delusional perception in the proper sense. The apophanous phase affects not only the external space but also the field structure of internal space, ie, the representational aspects of mental life. According to Conrad, the loss of the figure/ground distinction between internally generated mental events and the external world plays a role in auditory hallucinations, thought disorder, and thought broadcasting.

Integrating Phenomenology and Cognitive Neuroscience

Subsequent Phenomenological Studies on Perception in Schizophrenia

Later research has substantiated the insights of Binswanger, Conrad, Matussek, and Blankenburg concerning changes of perception in schizophrenia. McGhie and Chapman[46] examined subjective experience in a cohort of patients with schizophrenia during the early course of the disorder. The authors reported dramatic changes in perception and attention (see table 1) that are compatible with those observed by Matussek, Conrad, and Binswanger. Disturbances of perception were reported for auditory, visual, as well as kinesthetic perception. In accord with the 4 authors discussed in this review, McGhie and Chapman[46] viewed disturbances in perception and attention as the fundamental disorder in schizophrenia, whereas the psychotic symptoms represented reactions to this basic

disorder. In a retrospective study, Cutting and Dunne[47] investigated subjective experience in patients with remitted schizophrenia and depression. The most reliable item that differentiated the 2 disorders was "*perceptual anomalies*." These were pronounced in the patients with schizophrenia and were already present at the beginning of the disorder.

The Bonn Scale for the Assessment of Basic Symptoms (BSABS) developed and implemented by Huber and colleagues in a series of studies lends further empirical support for perceptual disturbances in schizophrenia. (see 48). The phenomenological authors discussed in this review, especially Conrad, influenced this research. Simple cognitive perceptual changes occur in approximately 33% of schizophrenia patients according to the samples examined with the BSABS. In Huber's view, the patients are often able to correctly identify their environment, but it somehow appears differently through shifts in intensity, quality or distortions, and disrupted coherence. Self-experienced perceptual anomalies as assessed by the BSABS also predict the conversion from prodrome to a schizophrenic psychosis.[49]

Experimental Study of Perceptual Anomalies in Schizophrenia

Recent experimental study has focused on perceptual processing as an important dysfunction in schizophrenia that may hold wider clues to understanding the disorder.[15,16] These data show that early perceptual processing mechanisms (1) are impaired in several domains of sensory processing, (2) cannot be explained by deficits in higher cognitive functions, (3) are related to anatomical abnormalities in cortical and subcortical structures, and (4) are associated with poor prognosis, widespread cognitive impairments, and impaired social and occupational functioning.

The perceptual organization hypothesis is a model of perceptual processing deficits in schizophrenia, which has gained the most consistent experimental support and which is the most compatible with the phenomenological data.[16,50–53] *Perceptual organization* is defined as the ability of perceptual systems to organize sensory information into coherent representations that contribute to the coherent and organized experience of the world. Wertheimer[31] first described the principles involved in the formation of organized visual objects. He identified a number of laws or principles of perceptual grouping, including similarity, proximity, good continuation, and common fate. The central tenet of Gestalt psychology, that perception is not a product of independent local stimulation but is characterized by emergent, holistic properties, has been confirmed in numerous experiments.[31,54–60]

Place and Gilmore[61] presented early experimental evidence for a dysfunction in perceptual organization in patients with schizophrenia. Until then, cognitive theories of schizophrenia interpreted dysfunctions in information processing within conceptual frameworks that emphasized "*reduced processing capacity*," "*slowness of processing*," or a "*deficient filter*" (for review, see Knight[50]). Place and Gilmore[61] tested the hypothesis that controls would do better than schizophrenia patients in counting the number of lines in tachistoscopically presented arrays when the lines (2–6 horizontal and/or vertical line segments arranged at the points of an imaginary hexagon) were arranged in a way that allowed for quick grouping (eg, having lines of only one type or grouping all horizontal segments together and all vertical segments together). They reasoned that while performing the task, the healthy controls would benefit more than schizophrenia patients in the condition when the lines were grouped. They predicted that in the condition where lines of differing orientations were randomly intermixed, the schizophrenia patients, who were hypothesized to be deficient in grouping processes, would be more accurate than controls. These predictions were confirmed.

Since 1980, numerous studies have confirmed that schizophrenia patients are impaired in perceptual organization as well as the finding that deficits in perceptual organization can lead to performance advantages in schizophrenia patients. For example, in 10 separate studies, schizophrenia patients were found to be faster in detecting targets than control groups in cases where the configural arrangement of targets and distractors hindered the performance of the control group (reviewed in Uhlhaas and Silverstein[16]). These data provide particularly strong evidence for the perceptual organization hypothesis of schizophrenia.

Dysfunctions in perceptual organization have also been demonstrated in auditory perception in schizophrenia.[62] This is consistent with the phenomenological data that implicate dysfunctions in perceptual organization in several domains, including visual, auditory, and kinesthetic perception.[46] The multimodal impairment in perceptual organization is supported by the fact that perceptual organization is not confined to the processing of visual input but represents a common principle of cortical processing. There exists a close relationship, eg, between the principles that govern the organization of visual input and the organization of auditory stimuli (for review, see Bregman[63]).

Impaired perceptual organization in schizophrenia is linked to specific task parameters. Thus, patients with schizophrenia are characterized by pronounced deficits in perceptual organization when top-down input is required to form novel stimulus groupings, whereas performance is relatively normal on tasks using highly configural stimuli. Evidence also suggests that strengthening top-down feedback to perceptual processes can improve the performance of schizophrenia patients in perceptual organization tasks (see Silverstein et al[64] study 2). These findings suggest that perceptual organization dysfunctions in schizophrenia may therefore reflect a deficit in

the efficient integration of prior expectancies with concurrent sensory inputs as hypothesized by Hemsley.[65]

On a clinical level, the most consistent clinical correlates of impaired perceptual organization in schizophrenia are the disorganized symptoms, such as thought disorder, and inappropriate affect and behavior.[16] Taken together, the findings on dysfunctional perceptual organization in schizophrenia have been interpreted as indexing a wider impairment in the generation of coherent cognitive activity.[66]

Convergence of the Phenomenological Perspectives and Experimental Psychopathology

The evidence reviewed strongly suggests that the perceptual deficits in schizophrenia described by Binswanger, Matussek, Conrad, and Blankenburg more than 50 years ago do not represent secondary impairments that result from attentional deficits or reduced processing capacity but are indeed due to basic deficits in perceptual organization. This represents an impressive convergence of evidence from phenomenology and experimental research in schizophrenia.

Keri et al[67] reported a specific link between the phenomenological data and experimental psychopathology. The authors examined perceptual organization in 35 unmedicated patients with schizophrenia by presenting Gabor patches with collinear and orthogonal flankers. In a previous study, Keri and colleagues[68] found that patients with schizophrenia were less sensitive to the collinear flankers, suggesting a deficit in excitatory lateral connections in early visual cortex. The BSABS was administered to assess anomalous perceptual experiences. There was a significant correlation between BSABS scores and deficits in perceptual organization. Thus, dysfunctions in perceptual organization may directly underlie the self-experienced perceptual deficits indicated by the BSABS[48] in patients with schizophrenia.

A number of other specific hypotheses proposed by the earlier phenomenological authors regarding deficits in perceptual organization have been confirmed. Matussek[9(p91)] proposed that drawing attention to relevant information could bring about awareness of appropriate contextual relationships but that this awareness of context would be of limited duration and would soon disintegrate. Subsequently, the ability to improve perceptual organization and other forms of context processing in schizophrenia through attentional manipulations has been demonstrated experimentally,[69] as has the temporary nature of the effect.[70,71]

Data from phenomenology and experimental psychopathology also converge on findings suggesting that perceptual anomalies may be differentially expressed in subtypes of schizophrenia. For example, Matussek and McGhie and Chapman concluded from their studies that the degree of impairment in perceptual organization is related to the severity of the illness. Knight[50] and Silverstein et al[69] demonstrated that perceptual organization impairment is found mainly among schizophrenia patients with histories of poor premorbid social functioning. Silverstein et al further demonstrated that (1) among patients with poor premorbid histories, the impairment is most pronounced during periods of symptom exacerbation,[69,72] and (2) greater degree of perceptual organization impairment on admission to a state hospital predicted a less likelihood of being discharged within the next 3 years.[51] In addition, several studies have now demonstrated relationships between level of perceptual organization impairment and degree of disorganized thinking and behavior.[51,69,73–76] In summary, these data suggest that dysfunctions in perceptual organization may be correlated with specific clinical and demographic characteristics of patients with schizophrenia and may not occur across the whole spectrum.

Relationship of Perceptual Organization Dysfunction to Cognitive Deficits in Schizophrenia

The phenomenological models proposed by Matussek, Conrad, Binswanger, and Blankenburg emphasize deficits in the perceptual field as primary in schizophrenia. This stands in contrast to the main focus of more recent phenomenological psychopathology as well as approaches based on cognitive neuropsychology that have emphasized deficits in higher cognitive functions as playing the primary role in disrupted self-experience. However, the 4 phenomenological authors we present in this review provide an alternative explanation, ie, the allegedly more *complex* processes of disrupted self-experience and cognition are, in part, secondary to perceptual anomalies. Moreover, recent research on perceptual organization in schizophrenia supports the view that deficits in the grouping of stimulus elements into coherent object representations may be related to a wide range of cognitive dysfunctions. The critical role of perceptual grouping in information processing suggests that deficits in attention could in part arise from dysfunctional perceptual organization in schizophrenia spectrum disorders. A prominent theory of visual cognition holds that perceptual organization functions to define objects automatically and preattentively in the visual field.[77] As a result, perceptual organization is a prerequisite for the attentional and serial analysis of relevant objects in the visual field and for the automatic access to object-related semantic information.[78] From this perspective, it is highly feasible that deficits in preattentive perceptual organization lead to reduced processing capacity loads. The breakdown in parallel, automatic processing would use up more of the serial processing strategies and would strain the limited capacity attentional resources.[79] Such a hypothesis is consistent with evidence that suggests that patients with schizophrenia are deficient in perceptual tasks that require the ability to automatize the processing of less prepotently organized stimuli.[73] Functional neuroimaging also provides evidence that patients with

schizophrenia fail to automatize aspects of complex cognitive tasks that come naturally to healthy controls.[80,81] These findings are consistent with the subjectively experienced loss of spontaneity and automaticity reported by Blankenburg's patients.

Dysfunctions in perceptual organization may also account for deficits observed in working memory (WM), a core neuropsychological impairment in patients with schizophrenia.[82] Current theories of WM suggest that consolidation in WM involves the integration of object features into coherent representations.[83] From this perspective, dysfunctions in perceptual organization in schizophrenia may therefore impact WM capacity by reducing the ability to build up and maintain coherent objects during WM. Several studies have supported this hypothesis demonstrating impaired encoding of information in patients with schizophrenia.[84,85]

Binswanger[12] proposed that the rules for the synthesis of time relationships in perceptions are also deformed in schizophrenia. Using an interval-timing task, Mishara and Gallistel[86] demonstrated that time perception is consistently abnormal in schizophrenia patients despite medication status. In a double-blind, cross-over repeated measures design, patients with schizophrenia exhibited abnormally long latencies in interval estimations (in the seconds range) in both medicated (atypical antipsychotic) and nonmedicated (placebo) conditions. Such abnormal latencies (dissociable from reaction time deficits) may reflect impaired perceptual organization as a dynamic process[12] (see appendix).

Dysfunctions in perceptual processing have been also implicated in social cognitive impairments in schizophrenia.[87] Several studies have indicated that dysfunctional perceptual processing is related to poor premorbid and current social functioning as well as specific deficits in ToM. Uhlhaas et al[94] reported that superior performance of patients with schizophrenia in a visual-context processing task relative to controls was correlated with impaired performance on 3 ToM tasks. Similarly, Schenkel et al[88] found that degree of ToM impairment was associated with poorer performance on both visual and linguistic context processing measures. Mishara et al[89] found that poor attention as assessed by the Scale for the Assessment of Negative Symptoms[90] is largely responsible for ToM impairment in the hinting task in patients with predominantly negative symptoms. Thus, prior knowledge, which implicitly guides the allocation of attention to social stimuli, may fail to constrain ToM inference suggesting abnormalities in context processing.[91]

Neurobiology of the Perceptual Field in Schizophrenia

Recent research has identified neural correlates of impaired perceptual organization in schizophrenia. A fundamental problem in current cognitive neuroscience is the question of how the brain constructs coherent object representations from neural information that is processed in different areas of the brain. Theoretical and empirical data indicate that synchronized correlated activity within the gamma (30–80 Hz) and beta (15–30 Hz) frequency band may serve as a temporal code for coherent object representations.[92]

There is evidence that deficits in perceptual organization in patients with schizophrenia could be related to impaired neural synchrony. Spencer et al[93] provided the first experimental evidence for a relationship between impairments in perceptual organization and dysfunctional neural synchronization. These data were confirmed and extended in a recent study conducted by Uhlhaas et al.[94] We examined the electroencephalograph activity in 19 patients with a DSM-IV diagnosis of schizophrenia and 19 healthy control subjects during a Gestalt perception task. Deficits in Gestalt perception in schizophrenia patients were associated with reduced phase synchrony, an index of large-scale neural integration, in the beta band (20–30 Hz), whereas the induced spectral power in the gamma band (40–70 Hz) was largely intact. Our findings suggest that schizophrenia patients are impaired in the long-range synchronization of neural responses that may underlie the deficit in perceptual organization. In our view, linking these 2 areas of research represents one of the most promising approaches for understanding perceptual organization dysfunctions in schizophrenia.

Conclusions

Changes in perception have rarely been considered an important starting point for investigations concerning the cognitive deficits and symptoms of schizophrenia. Our review suggests, however, that both pervasive and subtle alterations of perception occur in schizophrenia and may have a wider relevance for understanding the disorder. This hypothesis is supported by the phenomenological research reported in this review. Alterations in perceptual organization in schizophrenia are related to altered self-experience and sometimes result in the development of delusions. Our review shows that these phenomenological data are strongly supported by experimental and neurophysiological research that has identified possible neurobiological correlates of the deficits in perceptual processing. This research suggests that patients with schizophrenia have deficits in the ability to combine stimulus elements into coherent object representations. These deficits may represent a core disturbance in the generation of coherent cognitive and neural activity.[95]

Besides the emphasis on the relevance of perceptual dysfunction for understanding schizophrenia, we have shown that phenomenological data can be meaningfully integrated with cognitive and neurophysiological approaches. Descriptive psychopathology has been frequently at odds with explanations from psychology and biology, leading frequently to either a purely

biological or a purely philosophical approach in the history of psychiatry. We believe, however, that phenomenology is necessary in the efforts to understand schizophrenia. It provides a method that reveals complex manifestations of the disorder in the subjectivity of the patient. It can also guide the search for the underlying cognitive and neurophysiological dysfunctions associated with the disorder. In order to achieve this goal, future research needs to incorporate phenomenological perspectives and methods besides the existing neurophysiological and cognitive approaches. This will provide more comprehensive insights into the complex nature of the disturbance of mind and brain in schizophrenia.

Appendix: A Brief Review of Pertinent Phenomenological and Gestalt Concepts

Influenced by descriptive geometry, Husserl described 4 phases of method for the *scientific* study of meaning as it emerges in consciousness: (1) a deliberate attitude of the researcher isolates a domain of objects to be investigated by bracketing any presuppositions about their nature; (2) careful observation and description; active methods may be applied to bring out different aspects of the objects, eg, by varying the perspective in active imagination; (3) putting the observations into a neutral technical language (a fixing of the phenomena); and (4) intersubjective or consensual validation by imparting the results to a community of investigators who test the results by repeating the methods.[1]

Phenomenological psychopathology is often misunderstood to be no more than first person accounts based on introspective reports. Although "self-reports" of individuals with mental disorders can be very helpful and are taken at their own level of evidence for revealing meaningful mental structures—and we have made ample use of self-reports in the current review—phenomenological psychopathology does not exclusively rely on these reports. Rather, it attempts to methodically disclose the meaning of structures of consciousness in general in order to provide theoretical models of their distinctive variations, or disturbance in different disorders, which can be further tested with experimental designs.[96]

A closer examination of perception reveals that the meaning we encounter is closely related to one of the essential properties of perception, namely, its inherent organization.[33,35,97] Perceptual data never appear in isolation but as objects, as unified wholes, or as events that present themselves within certain contexts to produce Gestalt coherence.[97] Gestalt coherence can also be observed in the relationship between individual, segregated objects (as in the example of the train station scene described earlier). The latter example also highlights the relationship between meaning and organization. A scattered field of white dots will appear as a chaotic meaningless display, until the individual elements are grouped together to reveal the particular object, eg, a Dalmatian dog. Organization and Gestalt coherence are not confined to visual perception. While listening to a piece of music, eg, the melody of a song appears as unified whole separated from the stream of sounds in the background. The fact that organization is not confined to visual perception but occurs in other domains as well suggests that it is a universal pattern that is realized in the various domains of consciousness regardless of its content.[97]

Organization is an intrinsic feature of the perceptual field that exists at the levels of individual objects, their references to one another, and in the structure of the perceptual field as a whole. According to Brentano,[98] each act of consciousness is intentional, ie, it is directed to an object that is presented as a meaningful entity within an organized context. Husserl[38] advanced the notion of intentionality by differentiating between 2 different intentional processes responsible for perceptual organization: those actively generated in conscious awareness passive and automatic processes. (Intentionality in this sense does not connote purpose or intent. Intentionality is a fundamental characteristic of being conscious, ie, intending an object. It is the ability of consciousness to intend [from the Latin, *in* + *tendere*: act of stretching into] something other than itself. This is the case even if this intentionality is directed to one's "self" as in self-reflexive processes. The intentional experience of "object" requires the underlying—nonconscious or passive "synthesis" of its spatial and temporal aspects or profiles [*Abschattungen*]. That is, intentionality as well as its component processes is in part nonconscious or automatic.) The latter may consist of (1) components of intentional acts or (2) the intentional acts themselves.[99–101]

1. The perception of meaningful objects relies in part on automatic processes that are subcomponents of intentionality. For example, our expectations about objects based on past experience play an implicit, largely unnoticed role in the continuity of experience. Husserl[102] writes, "When we see a dog, we immediately anticipate its additional modes of behavior: its typical way of eating, playing, running, jumping, and so on. We do not actually see its teeth; but although we have never yet seen this dog, we know in advance how its teeth will look—not in their individual determination but according to type, inasmuch as we have already had previous and frequent experience of 'similar' animals, of 'dogs'…" That is, we perceive the not yet known or unfamiliar in terms of the known,[102] ie, in terms of the general *type* that is activated in the particular perception. With each view, there is built a reference to the next anticipated view based on past experience of this and similar objects. The references between aspects

are anticipatory constraints, which are nevertheless open to revision or cancellation in their structure so that each aspect prefigures its successor in seamless transition as belonging to the same perceptual object. When viewing an object, eg, the cup of coffee that I am about to grasp, there is a rear side of the cup that is not available to the current view. Nevertheless, the aperture of my grasp more or less correctly computes or anticipates the 3-dimensional volume of the object about to be grasped. This is based in part on my current view of the object's surface (including textural cues) and in part on my previous experience with this and similar objects. (We leave out of the current analysis the way that perception and movement in the coffee cup example are coordinated in terms of dorsal and ventral visual processing streams. [For a discussion of how these may be disrupted in schizophrenia, see [20]].) In the phenomenological theory, a *type*[102] or *schema*[12] provides the principles of organization, ie, rules for synthesis of aspects of the perceptual object in its inner structure. Object perception requires the ongoing synthesis or binding of (1) the currently experienced aspect with (2) the aspects not available to current perception and (3) a totality or unity of aspects that is never actually given in terms of the one aspect. The type or schema implicitly organizes the aspects of an object into a coherent relationship of perceptual meaning prior to its conscious perception. The fact that the object type or schema is already activated at this level of object recognition and is responsible for the inner mutual coherence of aspects or views of the object (as variants of the object's core but invariant perceptual meaning) allows for the seamless transition from an object's prelexical identification in visual perception to its linguistic expression in conscious explicit judgments. (However, conscious awareness of the object does not require this transition to verbal naming.) Because the type is anticipatory, it provides the rules by which each partial view is in turn synthesized into an object, a totality that is never apprehended by just one view. It is not possible to experience the perceptual object in terms of all its aspects at once.[97] The perception of a thing is relative to the standpoint of the observer. It is a manner of going beyond the information given.[103]

2. According to Husserl,[104] the ego or self has conscious awareness of only some of its processes. These processes are usually actively generated by the ego in awareness. On the other hand, operative or automatic intentionality is that which produces the natural and prepredicative (ie, prelexical, prior to explicit predication in conscious judgments) unity of the world and our experience.[33(pxvii)] Through this operative intentionality, the subject is prereflectively directed toward the world in unity with the self, which is given prior to any specific act of reflection or knowledge. The organization and unity of the perceptual field emerges as identical with and a necessary part of prereflective directedness because organization and unity of the perceptual field are experienced as intrinsic features of it. The phenomenological authors we discuss in this review provide evidence that it may be this fundamental level of the organization of meaning that is disrupted in schizophrenia. However, after extolling phenomenology for the richness it brings to psychopathological research, we must also note its limits. It provides only an initial method to take into consideration and to develop a conceptual language about the patient's subjectivity. The resulting hypotheses still need to be tested experimentally.

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