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Phenomenology and neurobiology of self disorder in schizophrenia: Primary factors

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ABSTRACT

Schizophrenia is a heterogeneous syndrome, varying between persons and over course of illness. In this and a companion article, we argue that comprehension of this condition or set of conditions may require combining a phenomenological perspective emphasizing disorders of basic-self experience ("ipseity disturbance") with a multidimensional appreciation of possible neurobiological correlates—both primary and secondary. Previous attempts to link phenomenology and neurobiology generally focus on a single neurocognitive factor. We consider diverse aspects of schizophrenia in light of a diverse, albeit interacting, set of neurocognitive abnormalities, examining both synchronic (structural) interdependence and diachronic (temporal) succession.

In this article we focus on the primary or foundational role of early perceptual and motoric disturbances that affect perceptual organization and especially intermodal or multisensory perceptual integration ("perceptual dys-integration"). These disturbances are discussed in terms of their implications for three interconnected aspects of selfhood in schizophrenia, primary forms of: disrupted "hold" or "grip" on the world, hyperreflexivity, diminished self-presence (self-affection).

Disturbances of organization or integration imply forms of perceptual incoherence or diminished cognitive coordination. The effect is to disrupt one's ability to apprehend the world in holistic, vital, or contextually grounded fashion, or to fully identify with or experience the unity of one's own body or thinking—thereby generating an early and profound (albeit often subtle) disruption or diminishment of basic or core self and of the sense of existing in a coherent world. We discuss interrelationships or possible complementarities between these three aspects, and consider their relevance for a neurodevelopmental account of schizophrenia.

1. Introduction

Schizophrenia is a heterogeneous clinical syndrome, with significant psychopathological variation both between persons and within the same individual at different moments of life or course of illness (Silveira et al., 2012; Silverstein et al., 2014; Tandon, 2014; Tandon et al., 2009). Current diagnostic classifications approach this complex phenomenon using syndromatic definitions based on presence or absence of a restricted set of signs or symptoms, selected by expert consensus (Andreasen, 2007; De Leon, 2013; Kendler, 2009; Stanghellini, 2009b). Starting with DSM III, interrater reliability came to be highly emphasized, with identification of operationalized signs and symptoms tending to replace more complex but judgmental assessment of mental or experiential life (Andreasen, 2007; De Leon, 2013; Kendler, 2009; Marková and Berrios, 2009). Arguably, this has led to inclusion of patients with divergent clinical symptomatology in the same diagnostic categories, thereby producing validity difficulties that undermine both research and treatment (Insel, 2009, 2010; Kendall, 2011; Naber and Lambert, 2009; Parnas et al., 2013; Tandon, 2012; Tyrer and Kendall, 2009). Criticism of the schizophrenia diagnosis has a long history, yet no viable alternative has arisen, perhaps suggesting some underlying validity to this admittedly problematic diagnostic category.

Phenomenology is the study of lived experience, i.e., of the nature and varieties of human subjectivity (Sass, 2010). Phenomenology can complement the clinical panorama by offering a sophisticated way of describing subjective dimensions of mental illnesses (Fuchs, 2010; Sass, 2010; Sass et al., 2011). In this and a companion paper, we review phenomenological descriptions of the schizophrenia syndrome while considering a variety of possible neurobiological correlates. We believe the best prospect for a valid comprehension of this enigmatic condition or set of conditions will derive from combining two viewpoints: 1, a phenomenological perspective that is sensitive to both the heterogeneity of "schizophrenia" *and* underlying commonalities; together with 2, a multidimensional appreciation of possible neurobiological correlates relevant to shared as well as divergent features of the illness, viewed both synchronically and diachronically (that is, both cross-sectionally and in terms of pathogenetic developments over time).

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The crucial role of adequate recognition of mental or psychological symptoms has been emphasized by various authors (Andreasen, 2007; Parnas et al., 2013). Marková and Berrios (2009) note that "mental symptoms play a more important epistemological role in psychiatry than "medical symptoms" in medicine, where the latter are being gradually replaced by "biological" markers" (Marková and Berrios, 2009; Nordgaard et al., 2013; Parnas et al., 2013). These authors stress the need to generate a psychiatric epistemology capable of addressing both structural (synchronic) and temporal (diachronic) relations within or between mental phenomena in clinical syndromes (Marková and Berrios, 2012). Sass (2010, 2014) has argued that phenomenology, in particular, can help generate explanatory hypotheses relevant to several types of both the (diachronic) temporal unfolding of symptoms and the (synchronic) complementary relationships existing between distinct aspects of abnormal experience at a single phase or point in time.

Various empirical studies demonstrate association between subjective abnormalities and neurobiological dysfunction in diverse mental syndromes or diseases, supporting subjective experience as an object of study in biological psychiatry and neuroscience (Lutz and Thompson, 2003; Sass et al., 2011; Varela, 1996). There are a number of previous attempts to link phenomenology and neurobiology/neurocognition in schizophrenia (Fletcher and Frith, 2008; Nelson et al., 2014a, 2014b; Postmes et al., 2014; Sass, 1992; Taylor, 2011; Uhlhaas and Mishara, 2007). Whereas most previous attempts have focused on a single underlying neurobiological dysfunction, in these articles we consider diverse aspects of schizophrenia-related symptomatology in light of a diverse, albeit interconnected, set of neurobiological and neurocognitive abnormalities, and in terms of both synchronic (structural) interdependence and diachronic (temporal) succession over time. We will consider both the synchronic and diachronic dimensions in relation to the influential neurodevelopmental model of schizophrenia. In this model, noxious factors interfere with normal maturational brain processes during early stages of development, generating during childhood and adolescence neurologic (and concomitant subjective) abnormalities that at some point finally eventuate in the full-blown clinical syndrome (Gogtay et al., 2004; Insel, 2010; Parnas et al., 1996; Piper et al., 2012; Rapoport et al., 1999; Thompson and Levitt, 2010).

2. General considerations

Dysfunction, disruption, or dissociation of the self has long been recognized as a central psychopathological feature of schizophrenia (Sass, 2001). In contemporary psychiatry, the most prominent, phenomenologically oriented account of schizophrenia identifies the primary disturbance as a disruption of core or minimal self, also known as ipseity (Sass and Parnas, 2003; Sass, 2014; Nelson et al., 2014a, 2014b). The term "self" is highly ambiguous. Here we refer not to issues of social identity or autobiographical self-awareness, but to the most basic sense of selfhood or self-presence: a crucial sense of self-sameness, a fundamental sense of existing as a vital and self-identical *subject* of experience or *agent* of action (Sass and Parnas, 2003; Sass, 2014).

The model of an altered core or minimal self in schizophrenia has received considerable evidential support in the last decade or more. A meta-analysis by Hur et al. (2013), which combines 25 publications (690 patients with schizophrenia compared to 979 healthy controls), corroborates empirically a disturbance in minimal self as a core feature of this syndrome. Moreover, the phenomenological model of self-disorder in schizophrenia has been operationalized and validated in numerous studies using the EASE (Examination of Anomalous Self-Experience) (Haug et al., 2014; Nordgaard and Parnas, 2014; Parnas et al., 2014; Parnas and Henriksen, 2014). This instrument—a qualitative, semi-structured interview format—has demonstrated adequate psychometric properties including high internal consistency (Møller et al., 2011; Nordgaard and Parnas, 2014) and good-to-excellent interrater reliability with trained clinicians (Møller et al., 2011; Parnas et al., 2005).

The foundational disorder of core self or ipseity is understood from a phenomenological standpoint as having three interrelated aspects that, taken together, can account for all the major symptoms of schizophrenia (Sass and Parnas, 2003; Sass, 2007; Sass, 2003). The three aspects are:

1, *Hyperreflexivity*—which refers to an exaggerated self-consciousness, a tendency (fundamentally non-volitional) for focal attention to be directed toward processes and phenomena that would normally be "inhabited" or experienced (tacitly) as part of oneself, but now come to be experienced as having an alien quality (Sass, 1992; Sass et al., 2011).
2, *Diminished self-presence* (*or diminished self-affection*)—which refers to a decline in the (passively or automatically) experienced sense of existing as a subject of awareness or agent of action. (The term "affection" refers not to liking, but to a process of being *affected* by something (Sass, 2014; Sass et al., 2011)).
3, *Disturbed "grip"* or "hold" on the cognitive-perceptual world—which refers to disturbances of spatio-temporal structuring of the world, and of the clarity of such crucial experiential distinctions as perceived-vs-remembered-vs-imagined. (These seem to be grounded in abnormalities of the embodied, vital, experiencing self, which normally serves as a kind of constituting and orienting background for experience of the world (Gallagher, 2005; Sass, 2004, 2014; Sass and Parnas, 2003).)

These are largely descriptive concepts. When viewed in a pathogenetic context, each of these aspects can, however, also be understood in a more differentiated manner, with some manifestations or processes hypothesized to have a more primary or foundational, and others a more secondary though also crucial role in the development of schizophrenia. Whereas this article discusses the primary factors, a subsequent one will consider secondary factors that are typically generated by the more foundational ones, and with which they come to be intimately intertwined. See Table 1. (The primary-vs-secondary distinction is, of course, a heuristic simplification: there are not just two but many possible variants.)

In several models of normal psychological development (Piaget and Inhelder, 1969; Postmes et al., 2014; Stern, 2000; Rochat, 2009), sensory and motor functions are hypothesized to play a crucial role in early

Table 1
Types of ipseity disturbance.

	Phenomenological Abnormality	Neurocognitive factors
Primary factors	Primary disturbed "grip" Operative (or primary) hyperreflexivity Primary diminished self-presence (a.k.a. diminished self-affection)	Grounded in disturbed perceptual organization and integration, especially disturbed intermodal integration including motoric, proprioceptive, kinesthetic processes ("perceptual dys-integration")
Secondary factors	Reflective (or secondary) Hyperreflexivity (a.k.a. hyper-reflectivity) Secondary diminished self-presence (a.k.a. diminished self-affection) Secondary disturbed "grip"	Hypoactivity of Central Executive Network, and hyperactivity of Default-Mode Network (DMN), both associated with dysregulation of Salience Network

Ipseity = core, minimal, or basic self-experience.

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