Penultimate version, please quote the original.

A "second-person" model to anomalous social cognition

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Abstract Reports of patients with schizophrenia or a psychotic functioning show evidence of a fragmented and anomalous subjective experience. This pathological subjective experience may be related to the fact that a disembodiment inhibits the possibility of intersubjective experience, and more importantly of common sense. In this paper, we ask how can we investigate the anomalous experience both from qualitative and quantitative viewpoints. To our knowledge, few studies have focused on a clinical combination of both phenomenological assessment and biological methods, especially for Schizophrenia, or ASD therapeutics and diagnosis. We will claim qualities of perception and kinaesthetic phenomena are central features when considering human experience in general, and anomalous experience, in particular. We will thus attempt to bring forward a potential second-person scientific design, accounting for both the first-person subjective experiential aspects, and respective third-person neurobiological correlates of embodied aesthetics in anomalous experience. From this proposal, we further explore the consequences to clinical and research practice.

1. Introduction

Until recently, schizophrenia and autism spectrum disorder (ASD) were considered distinct nosologic entities, with different objective common underlying mechanisms (Kästner et al., 2015). Emerging studies suggest that there are both clinical and biological links between schizophrenia and ASD. The question regarding whether there is phenotypic overlap or comorbidilty between the two, dates back to 1943, when Kanner first used the term "autism" to describe egocentricism. The distinction between the two remained unclear for almost 30 years, until DSM-II included children with ASD under the diagnostic umbrella of schizophrenia. Specifically, under the DSM-5 (APA, 2013), ASD is characterized by persistent and significant deficits in social communication and interaction as well as motor, behavioural and cognitive mannerisms; and diminished or abnormal social interaction abilities (Hipólito, 2014).

Although a clear distinction between the two, schizophrenia and ASD, is nosologically and methodologically important, current emerging studies likewise indicate the genetic similarities between the two disorders (Ellis et al., 2016). Additionally on a cognitive and behavioural level, both disorders show parallels concerning a broad difficulty with social interaction, particularly in the identification of emotion in others (for ASD see Bruggink et al., 2016; Montgomery et al., 2016. For schizophrenia see Weisgerber et al., 2015; Green, Horan and Lee, 2015); in the recognition of social cues in general (see for Schizophrenia,

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Nikolaides et al., 2016; White et al., 2016. For ASD see Hipólito, 2014; Hoffmann et al., 2016), which has also been correlated with oxytocin receptors (Andari et al., 2016; Preckel et al., 2016; Guastella and Hickie; 2016).

On a phenomenological level, literature in this volume noticeably evidences the loss of *common sense*, and disembodiment (see Bizzarri, this volume), as clinical symptoms in schizophrenia (see also, Stanghellini, 2000; Nelson, Sass and Parnas, 2016; Parnas and Henriksen, 2016; Hipólito, 2016), and in autism (Baron-Choen, 1997). The just stated genetic, cognitive, behavioural and phenomenological similarities between the two disorders seem, thus, to indicate a shared nosology. If this assumption is correct, we suggest the possible application of a model that aims to understand and to clinically improve the mechanisms underlying *common sense*, both in schizoid and autistic disorders.

2. Sense-making and molecular expression

There is a rich literature of first-person schizophrenia reports stating how fragmented perceptual experience is. This may be related to the fact that a disembodiment experience inhibits the *shared intersubjective experience*, and concordantly, *common sense*. So, we propose an experimental model that combines first-person assessments − phenomenological −, and third-person correlates with molecular biology.

On a phenomenological level, the practice of common sense can be related to *sense-making* in the enactive theory. Enactive theory or *enactivism* argues that cognition arises through a dynamic interaction between an acting organism and its environment. It claims that our environment is one which we selectively create through our capacities to interact with the world. In this theoretical framework, the organism does not passively receive information from its environments, but it participates in the generation of meaning. This theory has been introduced by Francisco Varela, Evan Thompson and Eleanor Rosch, to emphasize the idea that the mind is an enactment of a world.

Accordingly, for Di Paolo and Thompson (2014), sense-making starts with a body, as it is a bodily process of adaptive self-regulation and a constitutive body-cognition link. To be a sense-maker is, among other things, to be engaged in an autonomous on-going social interaction (De Jaegher, Di Paolo and Adolphs, 2016), which can arise between two or more autonomous agents who are mutually adapting their dynamical coupling. This dynamical coupling usually involves autonomous (De Jaegher and Di Paolo, 2007) and engaged perceptual systems, sensorimotor neuronal structures, and physiological processes in a self-maintaining and self-sustaining organization. In summary, sense-making plays out and happens through the embodiment and situatedness of the cognitive agent: her ways of moving and perceiving, her affect and emotions, and the context in which she finds herself, all determining the intersignificance set by her and the environment. This social significance is of furthermost importance when understanding Schizotypal and autistic disorders, as we shall discuss further on.

The enactive theory has been further developed by Hanne De Jeaegher and Ezequiel Di Paolo, who put forward the hypothesis of *participatory sense-making*. Individuals coordinate their movements and utterances in social encounter, co-generating meaning, while transforming both the on-going interaction process and the individuals engaged in it. Thus, sense-making is a participatory, in the sense that it defined as joint sense-making, which allows social encounter and intersubjective understanding. In social understanding, the body, the interaction processes and the interpersonal experience play a crucial role. Hence, they call

for a method that studies the embodied and the interactive aspects of social understanding as the instrument *per se* to yield efficient scientific data (De Jaegher, 2016).

A method to study impaired aspects of intersubjectivity, such as schizophrenia and ASD, should bare in mind that bodily experience of interacting allows a way to address intersubjectivity as a form of not only understanding each other, but also the world together (Reddy, 2010). Such a meaningful engagement does not mean the co-existence and mutual necessity of various *first-person perspectives*. In fact, it does mean that these perspectives are, thus, co-created among subjects, in virtue of an autonomy that shapes not only on-going subjective experience, but also their participants (De Jaegher and Di Paolo, 2007; Di Paolo, 2015).

Autonomy plays a key characteristic of the described intersubjective meaningful engagement: the embodied, interactive coordination of sense-making (De Jaegher and Di Paolo, 2007). This concept should, however, be further clarified with the understanding of how it modulates social understanding and cognition (Pfeiffer et al., 2014; De Jaegher, 2015), specifically in ASD. For that matter, development psychology has illustrated how infants move and participate affectively and intentionally with their mothers, and therefore how they make sense of their interaction (Stern, 1977, 1985; Trevarthen, 1977; Bateson, 1979; Bullowa, 1979; Hobson et al., 2004; Malloch and Trevarthen, 2009; Delafield-Butt and Trevarthen, 2015). Nevertheless, research still needs to consider a clear, careful phenomenological description of *what it feels like* to connect with others and the great difference it makes to interpersonal understanding, particularly in ASD (Reddy, 2010; De Jaegher et al., 2016).

A better grasp of social understanding, if this theory is correct, would thus yield insights on individual experience, practical bodily engagement, and can be accomplished by a neurophenomenological method (Depraz, Varela and Vermersch, 2003). The most significant work on this method has been rigorously done by Varela (1996), Varela and Shear (1999), Shusterman (2008), Gendlin (1962), Stern (2004), Van Manen (1990), Ihde (2012) and Petitmengin and Bitbol (2009). These phenomenological approaches preserve the subjective lived experience as crucial for understanding the world, and our social and cultural practices, as sense-making beings (Thompson, 2005). Moreover, *participatory sense-making*, i.e. the intersubjective lived experience, is defined as a mutual circulation between cognitive science and phenomenology (Varela et al., 1991; Varela, 1996; Gallagher, 1997), and naturalized by Roy and colleagues (1999), which proves its relevance in ASD and Schizophrenia research.

As outlined in the introduction, Schizotypal and autistic disorders are currently described in literature as involving an impairment of sociocognitive function. We proposed to offer a new perspective on a model that, consonantly with De Jaegher (2016), assesses the phenomenal experience. In these disorders, *common sense* seems to be disrupted. In this section, we suggested that *participatory sense-making*, could provide a suitable background for the way individuals enact intersubjectivity. At this point, the question that still remains to be answered is how, then, to improve *common sense* in patients suffering from schizophrenia or ASD. We consider that this first-person phenomenological background and method could ideally be completed by a third-person biological measurement. In biological terms, there may be a possible relation between protein expression (Martins, Hipólito et al., 2016), possibly of interleukins − a group of secreted proteins and signal molecules − and the inhibition of common sense. It has been shown by Kolodner and Guzdial (1996) that cognitive load stabilization promotes sense-making. Likewise, for van Bruggen, Kirschner and Jochems (2002), interactive activity with others reduces extraneous cognitive load, which may be essential when the environment demands heavy cognitive resources, especially when

with cognitive impairment like ASD and Schizophrenia. According to these empirical results, it seems reasonable to consider that the practice of *common sense* may have a neuroendocrine-immune expression.

3. Second-person model[2]

Third-person studies are usually denoted as quantitative methods. They are applied by neuroscience, mostly on the sensorimotor studies, and by cognitive psychology, essentially focusing on the study of cognitive functions, such as language, memory, attention, etc., all of which belong to the object of study which has been called the *easy problem* (Chalmers, 1995). The methodological techniques are usually brain-centred and include imaging, time-response and button-pushes. An alternative *third-person approach* is molecular biological method, which usually tend to look for biomarkers − an indicator of some biological state, usually measured to examine normal biological processes, pathogenic processes, or pharmacological responses to a therapeutic intervention − which are bodily distributed network of proteins. Although, the identification of clinically useful biomarker tests still remains very challenging, there are already tentative studies for ASD, which include genetic, biochemical, neuropsychological, neurophysiological and neuroimaging *third-person measurements*. However, in psychopathological research there are crucial difficulties when advancing with genetic, proteomic and environmental contributions and their association with the cognitive phenotypic heterogeneity (Anderson, 2015), and it was not possible until today to find its possible biomarkers. Omic research, − which involves large number of analytes and observations, with transcritomics, proteomics, and metabolomics (Dudley et al., 2011; Maurer, 2012), − is a potential network perspective that potentially brings innovation to the *third-person method*, particularly because of their concern with both neurodevelopmental traits and neuroinflammatory states (Onore et al. 2012). A transcriptomic-proteomic approach has the unique characteristic of being a non-directed enlarged study, which may shed light on the potential protein networks involved in ASD. Moreover, a salivary sampling method, shown to be better than drawing blood (Lim, Garssen and Sandalova, 2016), has the characteristics of (i) being an ubiquitous biological substrate (Lim, Garssen and Sandalova, 2016); (ii) being easily collected noninvasively (Lawrence, 2002; Rosa et al., 2016) and, thereafter, not interfering with the cognitive state shared in an aesthetic *second-person* model of autism ASD; and (iii) being an important research tool (Chiappin et al., 2007) for clinical screening and/or diagnostic (Malamud, 2011).

Indeed, as an example of this approach, Arrais and colleagues (2013) already identified and annotated, *in silico*, i.e. in a bioinformatics tool OralCard, salivary proteins associated with ASD, like the eukaryotic translation initiation factor 4E (Gkogkas et al., 2013), analysed by combined proteomic techniques (Chi et al., 2009).

Quite the reverse are the *first-person methods*, which attempt to assess what is beyond the cognitive function, that is, the phenomenal experience and self-consciousness, and all the phenomenon under the scope of the *hard problem* of consciousness (Chalmers, 1995). These methods are usually applied by phenomenology, which aims to assess the qualities of the experiential phenomena.

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2 Note our notion is distinct from Varela's *second-person method*, which has merits to its own credit.

In this paper we would like to suggest, as an experimental method, a combination of *first-person assessments* with *third-person method;* what could be called a *second-person model.*

The first-person perspective of subjective experience is a valuable measuring tool particularly in psychiatric investigation and clinical practice. Various perspectives and method have been provided (for an exhaustive account see Piccinini, 2009). In psychology and neuroscience, the subjects issuing first-person reports and other sources of first-person data play the epistemic role of (self-) measuring instruments. Data from measuring instruments are public and can be validated by public methods (Piccinini, 2009, p. 2). In other words, first-person data are as public as any other scientific data. Piccinini also notes most of first-person methods generate data from verbal behaviours, but some don't. First-person data need not be based on first-person reports, or even on verbal reports of any kind. For instance, subjects may be asked to express their level of happiness (or pain) by pointing at images of smiling vs. frowning faces. "For this reason, the term "first-person report" — which is often used in this context — is too restrictive to capture all sources of first-person data. Instead, I will use "first-person behaviour" to denote any behaviour that is a source of first-person data (p. 2).

Daniel Dennett appears to assimilate Piccinini's proposal into his "heterophenomneology" (see Dennett, 2017), which consists in applying the scientific method with anthropological bent. In other words, Dennett suggests combining self-reports with all other available evidence to determine the mental state and discover how the subject sees the world. Although Dennett's view takes first-person data to be public, Dennett claims that (i) scientists should be agnostic about the truth value of first-person reports and (ii) they should interpret all first-person reports as expressions of beliefs (e. g., Dennett 2003). This means his view is that the primary explananda of a science of consciousness are the first-person behaviours, contrary to Piccinini's view, who considers that the primary explananda are the mental phenomena.

On the first-person level, phenomenology has proven to be an important tool to address intersubjective experience (De Jaegher et al., 2016). In contemporary research, cognitive scientists increasingly use the term 'phenomenology' to designate a first-person description of 'what it is like' of experience. The phenomenological method offers an indispensable scientific alternative, as a descriptive truly scientific study of the mind (Husserl, 2012, p. 102; Gallagher and Zahavi, 2013). The phenomenological method is not some kind of introspective psychology. Instead, it is concerned with the conditions of possibility of phenomena and appearances, that is, with the description and analysis of the details of the experiential dimension in order to clarify the cognitive contribution of the knowing subject (Gallagher and Zahavi, 2013), and the engagement between social beings and their actions.

Furthermore, Franz Brentano's neo-Aristotelian theory is understood as the science of phenomena, that is, the study of their qualitative properties, and elicited subjective experiences. His method is called experimental phenomenology[3], and was developed mostly thanks to Carl Stumpf (1873, 1883), who stimulated the experimental investigation culminating in Gestalt psychology, and further developed by Koffka (1935), and Wertheimer

3 There are two main "classical" versions of phenomenology: the Husserlian (transcendental) theory and the experimental (empirical) version of Stumpf, Meinong, Michote, among others.

(1923). This is known as The Berlin School of experimental psychology, which today is seen with a renewed interest in neuroscience of perception (see Kovács and Julesz, 1993; Koenderink, 2010; Todorovic, 2011; Bagdasaryan and Le Van Quyen, 2013; Wagemans, 2015; Jäkel et al. 2016).In the model here we suggest that on the first-person account, experimental phenomenology (descriptive psychology) might be applied in the schizotypal and autistic disorders, focusing on the qualitative aspects of the phenomenal anomalous experience. From this perspective, the qualities of perception and kinaesthetic phenomena should be a central feature when considering human perceptive experience in general, and Schizophrenia and ASD in particular.

Perception, under experimental phenomenology lens, is not a matter of colour or smells; rather, it is about the relationship between sensations happening in consciousness and how we inhabit the world. The perspective we put forward is very much inspired by the pragmatic view of Wittgenstein (1963, 1984, 1993) and by the phenomenological view of Husserl (1970) and Merleau-Ponty (1962), since perception is a matter of the essential link between our embodied nature and our own mode of being in the world, − both as subjects and as members of intersubjective communities. In short, perception is a practice of perceiver's interactions with the world entailing a substantive commitment about what the perceivers are and what the world is.

A good example of the important clinical features within *first-person* assessment has been shown by, for instance, sensory-motor rhythmic abilities (De Jaegher, 2015), particularly because they allow for the measurement of social skills through timing and coordination (De Jaegher, 2007), either in a switch between different rhythms or in a co-coordination (McGann and De Jaegher, 2009). Accordingly, the interaction process and its dynamics can be empirically measured by qualitative performance, assessing how subjects (i) make sense of the world by moving around in it and with it; (ii) synchronize movements with others when interacting with them; and (iii) coordinate sense-making activities, affecting not only the world sense-making, but also of others and of themselves.

To our understanding, research on Schizophrenia and ASD therapy should then focus on how patients participate in each other's *sense making*, sharing meaning together and through interaction. Recently, there have been studies addressing these concerns, based particularly on art therapies. Interaction between the autistic patient and the parents and the therapists is vital as a *synch* dance (Trevarthen, 2006). This may be understood also in a literal sense. Dance as been described as valuable to fostering sensory integration and regulation, enhancing bodily synchrony and *praxis*, that is, the ability to play and engage in meaningful action within the world (Amos, 2015). In fact, Koehne and colleagues (2015) showed that fostering social cognition through an imitation and synchronization-bases dance-movement in adults with ASD improved emotion's inference.

Moreover, Sabine and colleagues (2016) tested dance movement therapy intervention, through mirroring in movement, in adults with ASD and Asperger's syndrome, with the aim of increasing body awareness, social skills, self-other distinction, empathy and well-being. This study showed that participants, after the intervention, improved well-being, body awareness, self-other distinction and social skills.

Likewise, Gavron and Mayseless (2015) explored joint-painting procedure as self-report measures of the quality of mother-child relations. Their results show art therapy treatment to be positive in psychotherapy. Other methods, focused on *second-person* perspective framework, include music therapy, which although already focusing on this,

might need to acknowledge the interactive *sense*, concerning social and meaning-making aspects. For instance, improvisational musical approaches have linked the deep continuity between cognition and improvisation (van der Schyff, forthcoming). Moreover, interactive improvisation music therapy for children with ASD may be applied as a possible treatment model (Geretsegger el a., 2015), setting the theoretical basis for an interactive or participatory sense-making therapy.

4. Discussion

The majority of current studies on ASD take a psychophysical stance with experiments being carried out using classical *third-person* neuroscientific methodologies, which means they mainly consider the *stimuli* of neuronal activity. This method, however, seems insufficient *per se*, since we also need to analyse and describe qualitative perceptive phenomena in order to understand how meaning-making is processed in its interactive and social manner. Phenomenology constitutes a valid method to precisely address this accounts: the characteristics of other person's subjective experience and intersubjectivity, therefore offering to the experimental scientist indirect evidence about that experience (Lappin, 2013). To our knowledge, few studies have focused on a clinical combination of first- and third-person methods: *second-person* model, especially for Schizophrenia, or ASD therapeutics and diagnosis, which is indeed what we propose here, and which can be schematized as follows,

Figure 1.

Furthermore, to ensure the conceptual continuity between sociocognitive functions of Schizophrenia and ASD, subjective experience and intersubjectivity, and to overcome epistemological difficulties we propose a series of premises to guide research designs:

(i) the scientific study of the universals of subjective experience is a paradigmatic case of intersubjectivity;

(ii) individuals coordinate their movements and utterances in social encounter, co-generating meaning and co-transforming the on-going interaction process;

(iii) the clinical setting should focus on the enhancement of the shareable meanings (intersubjectivity) between the patient and the medical doctor; aesthetic appreciation could be used as a tool;

(iv) subjective experience should be brought into focus by the methodological combination of first- (qualitative) and third-person (quantitative) methods, that is, a second-person model.

5. Conclusions

Anomalous identification of emotion in others have been studied, in ASD, by Bruggink and colleagues (2016), who come to the conclusion that cognitive emotion regulation may be purposed as a therapy. Montgomery and colleagues (2016, p. 1931)

suggests that adults with ASD "may need more support, particularly in mentalizing and complex emotion recognition". As Hipolito explained (2014), ASD patients have difficulties in the recognition of social cues in general, because "autistics' mode of empathy is more rule-driven, and their participation in social and moral scene differs from ordinary subjects. As autistics are unable to grasp human emotions intuitively and pre-reflectively through bodily attunement, they, instead, rely on pure logic (p. 273). While many of us are empathically engaged spontaneously and become immediately attuned to the concerns of others, autistics rely more on rules of conduct and general principles in order to navigate the social landscape. This might be described as a "cold" methodology that engages the interest, to a great extent, in order to bring about the sort of affective, bodily attunement that for ordinary subjects is already there. Ordinarily, this affective, bodily attunement, occurs spontaneously and pre-reflectively via affective framing.

Likewise, Green, Horan and Lee (2015), revised and identified the same social impaired processes in schizophrenia. Indeed, this lack of social attunement is a condition that is also present in schizophrenic patients. Hipolito (2016) investigates the second-person approach pointing out the importance of experiencing and interacting with others as our primarily way well-being. Hipolito (2016) identifies the second-person perspective taking can be used to point out specific features of social cognition and acquisition of knowledge, not only about other person's mental states such as their beliefs, desires and intentions, but also insight about the meaning of their utterings (p. 610).

A second-person method seems crucial, when investigating the difficulty ASD and schizophrenic patients show on the lack of intuitively and intersubjective attunement with others. Hipolito (2016, p. 611) offers the following explanation,

Imagine, for instance, you are studying a patient's brain. In this case, the third-person perspective is helpful because the disease might have a define location in space that can be assessed by a scanner. In contrast, you apply the first-person perspective when you wonder whether or not a brain scan is enough to understand the nature of the disease. If so, you need to find out how your patient feels, what are his beliefs, desires and intentions. Is he delusional? Hallucinating? Is he scared? Motivated? Irritated or depressed? In assessing our patient, the first-person perspective provides no information because his mental state is different from our own. Similarly, the third-person perspective cannot help because there are no objective facts upon which to access the person's thoughts and feelings. Therefore, to infer our patient's feelings is a paradigmatic case of social cognition. For it is not about one's own mental states; it is not just about facts.

From this remark, Hipolito (2016, p. 612) concludes that,

> Because (…) [n]ot all social encounters demand a third-person perspective, in fact, the second-person perspective seems to be the most accurate from a biological point of view, either to the online and offline intersubjectivity . . . empirical research should make a significant distinction, both between the first-person, third-person or the second-person approach.

Hipolito and Martins (forthcoming/2017) provide an account of the second-person method as a combination of qualitative analysis of the subjective experience and quantitative measurements of molecular protein networks. The authors focus the study in phenomenological data that will further be correlated with the protein profile for the subjective experience. The overall results, the authors claim, should move towards an integrated or global perspective on mind, where neither do experience (First-person person)

nor do external mechanisms (third-person person) have the final word. It seems hence appropriate to use methods that focus on the intersubjective experience, that is, the interpersonal processes involved.The following conclusions can be here drawn: (a) shareable meanings generated within subjective experience should be studied in a *second-person perspective;* (b) qualities of perception and kinaesthetic phenomena are central features when considering human perceptive experience in general, and ASD in particular; (c) phenomenological approaches preserve the subjective lived experience, which is crucial, as sense-making beings.

We claimed a scientific study on impaired social cognition and subjective experience should combine *first-* and *third-person perspectives*. This combination could be achieved by a *second-person* method, accounting for subjective, mental, experiential aspects and biological and neuronal ones. We therefore proposed that the phenomenological *first-person study* could be followed by a *third-person* method that uses proteomics and salivary samples as *third-person* measuring tool.

In this paper our major concern was to address phenomenological experience of non-sense as it is *first-personally* reported in literature by psychotic spectrum patients: schizophrenia and ASD. We discussed and attempted to understand how would it be possible to ease and conduct the therapeutic and epistemological process from *nonsense* to common sense. Thus, we presented a potential experimental design consisting in a *second-person* model. We proposed artwork and experiential aesthetics as an important tool to the diagnosis and therapeutics of ASD, particularly because it focuses on the qualities of phenomenal experience to assess the shared vehicle of intersubjective meaning. With this methodological procedure, we expect to contribute to the current methodological debate with a model that directly approaches schizophrenia and ASD anomalous qualitative and subjective experiential aspects, and objective biological accounts, as a major concern to its diagnosis and therapeutic.

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