WKL symptom-complexes *vs* positive and negative symptoms

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Reply to Hector Warnes' comment

We would first like to thank Hector Warnes for his comments (1). In this answer, we will address the following quote before replacing it into its original context at the end (2):

> *"I would tend to disagree with Prof. Foucher by stating that neither positive nor negative symptoms in schizophrenia are rare events (unless I misunderstood his point)."*

If we speak of positive and negative symptoms, we could only agree with Hector Warnes that these cannot be considered as rare. Yet, this is inherent to their construction: only the most common and hence frequent symptoms were used to describe them. In this response we shall only comment on the nature of positive and negative symptoms and their relationship with the WKL-framework. The "problem of rarity" shall be addressed independently.

What do we mean by "positive and negative symptoms"?

These concepts were first defined as ***constructs***, (pheno)types and syndromes, before being widely accepted as symptomatic ***dimensions***.

The Reynolds-Jacksonian interpretation framework and the Russian constructs

The positive-negative distinction was first proposed by John Russell Reynolds and later refined by Hughlings Jackson (3). Jackson was an English neurologist contemporary of Wernicke who proposed an understanding of clinicopathological correlations according to a hierarchical organization of neurological systems. Roughly speaking, functional deficits, i.e., negative symptoms, were supposed to result from the "dissolution" of high-level systems while functional excesses, i.e., positive symptoms, were mostly interpreted as release phenomena resulting from the impairment of a high-level control systems (Figure 1) (4). This mechanism is in line with the WKL systemic approach.

Naturalistic account: positive-negative constructs, (pheno)types and syndromes

1960s - the Russian school: constructs

Between the 1950s to '80s, these lines of reasoning framed Russian neuropsychiatric classifications. Andrei Snezhnevsky classified psychotic manifestations either as markers of functional deficits (negative) or as signs of functional excesses (positive) (5). Though referred to as positive and negative "***syndromes,***" they might deserve the name of "***constructs***" given the prominence of conceptual prerequisites in their elaboration.

1980 - The English school: (pheno)types

As surprising as it seems in this cold war era, the Russian "positive" and "negative" distinction was introduced in UK psychiatry by John Wing but stripped from any pathophysiological assumptions. However, the rise of the concepts owes a lot to their reconceptualization by Tim Crow as clinical manifestations of two different ***psychotic (pheno)types*** accounted for by different pathophysiological processes. Positive symptoms were supposed to be characteristic for type I and negative symptoms for type II. Type I was hypothesized to be accounted for by neurohumoural causes (e.g., dopamine) while, inspired by his (re)discovery of a ventricular enlargement in his seminal CT scan study of chronic schizophrenia, Crow assumed type II to be accounted for by brain atrophy (6).

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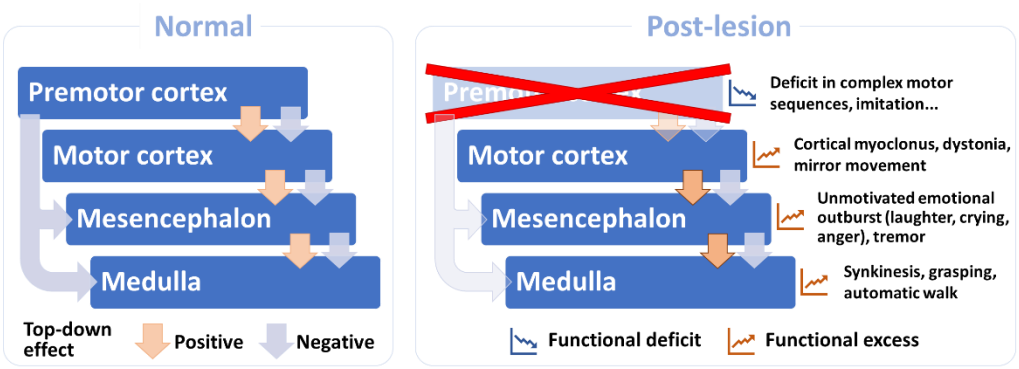

Figure 1: Jacksonian interpretation of neurological symptoms. In case of purely positive symptoms, Jackson thought that the negative ones were merely undetected, but present.

1982 - The American school: syndromes

Mid-term follow-up rapidly invalidated Crow's typological account: patients diagnosed as type I during the acute state were switched to type II. Still, evidence pointed out the dopamine-dependence of positive symptoms as opposed to negative symptoms. This gave rise to the "dual (pathological) process theory" of schizophrenia in American psychiatry. According to it, Kraepelin was wrong in supposing schizophrenia to be accounted for by a single dementing process (*Verblödungprozess*); the disorder was accounted for by two (7). The first process was supposed to be dopamine-dependent and to show up as a ***positive syndrome***. The nature of the second process was undetermined (supposedly non-dopamine-dependent) but it accounted for a ***negative syndrome***. The dual-process hypothesis gave impetus to the operationalization of clinical "measures" such as the Scale for the Assessment of Negative Symptoms (SANS) (8) and of Positive Symptoms (SAPS) (9) or the Positive and Negative Syndrome Scale (PANSS) (10).

Normativistic account: positive-negative dimensions

Again, the "dual process – dual syndrome" hypothesis did not appear as the good joints for the carving of nature. Unsurprisingly, multivariate analyses retrieved "something like" a positive entity and a negative one, but the overlap was underwhelming. Moreover, factorial analyses did better fit the data than cluster analyses and came with less expected dimensions such as disorganization. Hence, positive and negative symptoms stopped being considered as naturalistic entities and became viewed as (normativistic) dimensions. According to this hypothesis, symptoms are merely ***quantitatively*** and not ***qualitatively*** different from the norm so that the same positive and negative dimensions should be observed in the normal population. This is the case, but only when changing the instrument to avoid a floor effect (11). But results from multivariate analyses have no meaning by themselves. Everything is a matter of interpretation. For instance, normal population surveys suppose that hallucinations reported by controls are of the same nature than the ones reported by psychotic patients. Yet there may not be only one kind of hallucination: controls mostly describe hypnagogic and hypnopompic hallucinations which pathophysiological mechanisms could have nothing in common with the ones of some psychotic verbal hallucinations.

WKL-perspective

Positive and negative symptoms focus on commonalities rather than look at differences (see comment on "differentiated psychopathology"). Moreover, the positive and negative symptoms dimensions are normativistic entities and not naturalistic symptoms-complexes. Hence there is nothing like positive and negative entities in the WKL framework, this grouping only makes sense in a DSM/ICD perspective. For those who only know about ICD or DSM related entities, the symptom-complex of "happiness psychosis" for instance, would sound as strange as positive and negative symptoms for the WKL-school.

What is a "symptom-complex"?

A symptom-complex is not a symptoms' checklist: a patient who stays at home and does not meet others because he is anhedonic, abulic or apathetic might score the same on the "social withdrawal" item of the PANSS-N. Yet the former would be a primary loss of pleasurable emotions (loss of consummatory hedonia, as in melancholia for instance), the second a primary psychomotor impairment (loss of motivational impulse, e.g., in catatonic phenotypes) while the later would be a primary impairment in figuring out long-term pleasurably goals (anticipatory hedonia, as in hebephrenic phenotype for instance).

Checklist approaches do not distinguish between the different ***combinations*** and presume that all can occur. For instance, with the seven items of the PANSS-Positive scale there are 128 different combinations which are all supposed to be equally possible. This is not the case in a WKL-perspective which supposes that only a limited set of precise symptom-complex arrangements can be observed in 90% of endogenous psychoses (up to 95% if combined forms are included).

Let us exemplify this with two cases:

Case 1: Women, 50Y old. Became ill following influenza. At admission, she was excited but not agitated. She declared that she was not sick: "I am happier than the happiest human being." She said that Mrs. X. had been following her and had made her nervous but that she had forgiven her. Sometimes she spoke in monotones, as if she was praying a litany, and sang religious songs with eyes closed. When asked if she was blessed, she nodded beatifically. Among other things she claimed: "The most holy one

is coming soon. The mother of God has appeared to me. She wore a garment of heavenly blue, stood in heaven and waved to me"; "The day of the last judgement will be tomorrow. You will be astonished at what will happen. Stars will fall from heaven. The moon will no longer shine. The sun will be darkened and the dead will arise. I am happier than ever." The ecstasy gradually receded over eight weeks. The patient became rational, corrected her ideas and explained that she thought to have seen the mother of God and had received the knowledge that she must save mankind.

PANSS-P score (admission): 30/49

Case 2: Women, 28Y old. At admission, she was excited, cheerful, loquacious and displayed incoherence of thematic choice. She misidentified people around her and confabulated that she had met the interviewer three years earlier in a bar. Then her mood became more irritable, alternating between cheerfulness, irritability and tearfulness. She said: "I will also pull your feet - yes, a fallen woman - I love freedom - yesterday X stood before the door, he had his heart in the right place - no, we don't need to die..." She gave the doctor a false name and claimed he had had an affair with her previously. She claimed that other people had several names and that a certain nurse was her biological sister. After two months the excitement abated. She calmed down and was rational again having difficulties to recall her episode but had full insight that her behavior was pathological.

PANSS-P score (admission): 29/49

Though the PANSS-Positive score is not rigorously the same the two patients might not be distinguishable on this feature. Yet from a WKL point of view, case 1 had the clinical presentation of "happiness psychosis" with a primary involvement of ***affect*** (she later developed other episodes of the same anxiety-happiness psychosis phenotype). Case 2 had an excited confusion psychosis with a primary involvement of the ***thought and language*** processes (part of the excited-inhibited confusion psychosis phenotype). Isolated symptoms are not meaningful by themselves but only within internally coherent symptom-complexes (see comment on "differentiated psychopathology").

Functional deficit, functional excess and beyond

Jackson's interpretation in terms of "inhibitory control deficit" was also part of Wernicke's symptom-complex heuristic; for instance, he did not consider stereotypies to be necessarily related to a primary psychomotor disorder. Stereotypies could result from a release phenomenon, e.g., as a consequence of a primary inhibition of ideational processes (12). Yet it was only a (small) part of a much more multifaced systemic approach. Beyond release mechanisms, systems could also be primarily excited of malfunctioning. For instance, the inhibition of psychomotor systems results in akinesia, their excitation in hyperkinesia while their disarray results in parakinesia.

Putting Hector Warnes' comment back into its context: complex systems

It might be that Prof. Warnes' comment stems from the hereafter citation quoted from our response to Edward Shorter ("Metatheses of the Wernicke-Kleist-Leonhard research program") (13):

> *"Systems' dynamics depend on the evolving pattern of asymmetrical interactions. Even a single cause can have multiplicative effects resulting in the abnormally frequent emergence of rare events, e.g., positive symptoms and/or destructive effects resulting in the abnormally frequent loss of others, e.g., negative symptoms. Normal distributions cannot account for these normally exceptional occurrences; Fat-tail distributions do."*

An interactional framework

Our intention was to give a knowing wink to the Jacksonian interpretation. We made a generic use of "positive" and "negative" that was only intuitive from our WKL-perspective and apologize for that. Let us rephrase and explain our statement in a more ICD/DSM compatible way:

> *Even a single cause can have multiplicative effects resulting in the abnormally frequent emergence of* ***many rare symptom-complexes****, i.e., specific arrangements indicative for physiological or psychological* ***interactions*** *between symptoms.*

The Jacksonian's account is an example of ***physiological interactions***: a functional deficit (negative symptoms) resulting in functional excesses (positive symptoms). Yet beside physiology, Wernicke also considered that ***psychological interactions*** could account for the emergence of secondary phenomena. Primary symptoms could interact with each other or with the subject's personality, habits, temperament, culture, life history, etc. This is especially true for productive phenomena. For instance, delusional thought content might not be primary "autochthonous ideas." Delusions can also ensue a primary thought disorder or abnormal perceptions and experiences (hence resulting from a formally valid reasoning based on false premises). This is long known to occur in "organic" symptom-complexes, e.g., distrust and persecutory delusions are commonly observed in presbycusis or in the residuum of a Wernicke's aphasia; experiencing a sleep paralysis can led some subjects to be convinced of having been abducted by aliens; or split-brain patients can misinterpret their own intentions (Gazzaniga's "left-brain interpreter theory"). The same could apply to false perceptions, e.g., illusions and hallucinations can be primary or ensue a cognitive or an emotional bias or disorder. Simply put, in the WKL-framework ***patients are not passively experiencing their symptoms but react and/or adapt to them***.

Non-linearity matters!

The ICD/DSM check-list approach implicitly suggests clinical phenomena to be independent from one another. This is a prerequisite for factorial analysis if we want to interpret their results as existing entities.

But this is precisely where WKL systemic perspective defer. Not only elementary causes, but phenomena themselves interact with one another and with the subject's self. This does not preclude factorial analyses to provide results. Yet their interpretation will radically differ! In assuming that variables could be non-linearly mixed, the WKL-framework violates the most fundamental prerequisite of all components (and sources) decomposition methods. This precludes any interpretation of their results as being real entities. At best, dimensions could be interpreted as way to summarize inter-subject variance.

Conclusion

We thank Hector Warnes for bringing into the spotlight another illustration of misunderstanding which can emerge from the use of profoundly different conceptual frameworks. It allowed us to illustrate how the same results can be interpreted in two very different ways according to the framework we refer to: the existence of a continuum between normal and psychotic hallucinations and the reckoning of dimensions as real objects. In any case, knowing about the WKL-perspective might at least have the merit to help appreciating the contribution of preconceptions in our interpretations. It is nice that these questions can now be dialectically debated.

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