

‘Accentuate the positive’: Towards a new framework for understanding the etiology and mechanisms of core positive symptoms.

Speakers:

Sohee Park (Vanderbilt University)

Jim Van Os (University of Maastricht)

Anthony David (Institute of Psychiatry)

Robyn Langdon (Macquarie University)

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On Sunday, March 29, the evening workshop entitled ‘Accentuate the positive: Towards a new framework for understanding the etiology and mechanisms of core positive symptoms’ was held. Dr. Sohee Park began by providing an overview and introduction. Dr. Park was followed by Drs. Jim Van Os, Tony David, Robyn Langdon, and Stephan Heckers.

In her introduction, Dr. Park highlighted the importance of investigating positive symptoms, such as delusions and hallucinations in schizophrenia. She reported that a large proportion of individuals with schizophrenia (50-80%) experience hallucinations, and that importantly, these hallucinations are not responsive to treatment in approximately 25% of cases.

Dr. Park then went on to review the major theories that have been developed to explain positive symptoms in schizophrenia. She noted perceptual theories of positive symptoms, which focus on the known perceptual processing abnormalities present in schizophrenia. According to this theory, poor perceptual data is fed to intact logical and decision making processes, resulting in delusional belief. However, Dr. Park points out that this theory cannot explain all delusions as some may develop in the absence of abnormal perceptual experiences. In contrast, cognitive theories of positive symptoms focus on abnormal top-down influences on judgments and decision-making in schizophrenia. According to this theory, abnormal top-down influences may manifest in bad hypothesis testing and probability estimation, selective attention to threat, a tendency to see patterns in randomness, and an externally directed causality attribution. According to the cognitive theory of positive symptoms, this abnormal information processing leads to delusions. According to the motivation/emotional theory of positive symptoms, the content of delusions interacts with social and motivational factors. This theory highlights the observation that abnormal beliefs tend to be

social in nature and contain self-serving attributions. In this context, the construction of a delusional explanation for experiences may also serve the purpose of making the patient feel better. There are also neurological accounts of delusions, stemming from research in lesion patients experiencing psychosis, such as feelings of presence, autoscopic phenomena, and out-of-body phenomena. Finally hybrid models recognize that perceptual and cognitive problems interact. It is possible that abnormal bottom-up perceptual processes necessitate increased top down processing, such that poor data trigger more cortically driven interpretation.

Dr. Park concluded by outlining future directions for research into delusions. She highlighted the need to integrate across the many theories of delusions, including an appreciation of how cultural factors, such as religiosity, may constrain what beliefs are deemed delusional. She points out that further research is also needed to investigate the origins of abnormal top down processing and perceptual processing in schizophrenia.

Dr. Jim van Os began his presentation by posing a question: "Can you test delusions and/or hallucinations as a measure of psychoticism?" He proceeded to discuss early life subclinical psychotic experiences and affective dysregulation that may lead to a future psychotic disorder diagnosis. He discussed these ideas under the assumption of psychosis being represented on a spectrum.

Dr. Van Os presented evidence for a common mechanism underlying hallucinations and delusions, referencing data indicating that individuals who experienced subclinical hallucinations followed by delusions were more likely to transition to a psychotic disorder compared to those who had hallucinations but no history of delusions. Dr Van Os also proposed that negative symptoms can be represented on a continuum and are present in the normal population. He referenced work linking these subclinical positive and negative symptoms and suggesting that positive and negative symptoms cluster, but have different associations. That is, there is data indicating that a combination of subclinical positive and negative symptoms is more predictive of future transition to psychosis with impairment than positive symptoms alone. Dr. Van Os then presented data indicating a relationship between affective dysregulation and risk for psychosis, such that the number of depressive and manic symptoms predicts risk for the occurrence of positive psychotic symptoms.

To conclude, Dr. van Os summarized the need for studying psychosis in nonclinical samples in order to discover links between positive and negative symptoms and affective dysregulation. Moreover, he noted the importance of studying psychosis without treatment or illness confounds and investigating the onset of psychotic disorder as the outcome.

Dr. Anthony David offered somewhat of a counterargument to Dr. Van Os's talk and critiqued the idea of psychosis being represented on a continuum. He began by warning that the way in which a question is posed can influence the way in which the shape of a distribution is measured. He then defined two kinds of continua, which he referred to as Types I and II. A Type I continuum

supposes that a population of individuals can be distributed by levels of a given trait (i.e. schizotypy), and a Type II continuum supposes that the experience itself exists on a continuum (e.g. vague voice versus fully-articulated hallucinatory conversation). Dr. David stated that both continua imply a distinction between normal and abnormal functioning, but the implications of, and problems with, that distinction differ for each continuum. With a Type I continuum, an arbitrary threshold for disease is set, thereby leading to expected arbitrary treatment standards. In addition, as the population shifts in its level of the trait, criteria for disease will also shift. With Type II continua the definition of an abnormal experience, such as delusional beliefs, becomes important, since what is considered a delusional belief varies with factors such as cultural context, conviction, and plausibility. As evidence of this problem, he noted the number of items rated as questionable on traditional psychosis rating scales. However, Dr. David noted that there are benefits of measuring psychosis on a continuum: 1) it reflects the uncertainty in psychiatric diagnoses; 2) it encourages theory development in normal cognition; 3) it allows us to look at quantitative risk factors for disease; 4) it allows us to study disease-free individuals; 5) it serves to reduce stigma by virtue of its moral benefits (i.e. 'we're all a little bit mad').

As a counterpoint to the continuum view, Dr. David then discussed bimodal distributions of traits and argued that they must be considered despite difficulty in detecting them due to the use of composite measures and statistical averaging. He argued that measuring psychosis in healthy populations and attempting to define the lower end of the spectrum risks losing the essence of the phenomenon. He further argued that delusions are multidimensional, and that it is unclear whether severity can be represented on a continuum because dimensions may not be intuitive or meaningful to combine (e.g. are three voices worse than two?). He also stated that the rationale behind and explanations of delusional beliefs vary greatly across clinical and subclinical groups.

Dr. David concluded his talk by outlining the statistical and theoretical problems with representing psychosis on a continuum. Statistically, error of measurement and averaging can blur what might actually be a bimodal distribution of psychosis across a population. Theoretically, it is unclear whether psychotic phenomena are on a single continuum. Moreover, investigating psychosis on a continuum may inflate prevalence, rendering the diagnosis of disease meaningless. He stated, "If we are all a bit mad, then no one is mad." Finally, he provided suggestions for future research, advising researchers to look for discontinuities as well as continuities in psychosis across populations with the use of more sophisticated statistical methods, defining what constitutes discontinuities, avoiding composite scales and arbitrary measures of severity, and articulating in advance what sort of continuum of psychosis, across populations or experience, is hypothesized.

In her presentation, Dr. Robyn Langdon approached delusions from a cognitive neuropsychiatry approach. She began by defining the cardinal signs of delusions as first, incomprehensibility second, resistance to counterevidence, and lastly, a quality of subjective certainty (i.e. holding some self-evident truth).

Then she then made the distinction between primary and secondary delusions; while secondary delusions are understandable in context, primary delusions appear to spring into existence with no meaningful predisposition or basis. She clarified that, during her presentation, she would focus on so-called primary delusions.

Dr. Langdon described the general aims of exploring delusions from a cognitive neuropsychiatry approach: explaining the specific symptom in terms of disruptions in the information processes for forming normal beliefs. She then discussed the seminal work of Brendan Maher (1974), who theorized that delusions are psychologically understandable, given the bizarreness of the experience being explained. In other words, abnormal perceptual experiences in the presence of normal reasoning can give rise to abnormal beliefs. Dr. Langdon noted that this theory could explain why delusional thoughts are generated, but fails to explain why delusional thoughts are often not rejected in the face of counterevidence and their implausibility.

Dr Langdon then presented the two-factor approach, which expands on Dr. Maher's theory and proposes that there must be a concomitant abnormality in belief evaluation. Dr. Langdon acknowledged the role of experience in many delusions, and presented two approaches to understanding this role in relation to delusion formation. In the "explanationist" account and according to Maher's theory, abnormal experiences are reflected upon and drive the search for an explanation, thus resulting in the delusional belief. In contrast, an "endorsement" approach considers the delusional content as part of the primary perceptual misinterpretation; thus, the experience is not being explained as such, but rather the content is experienced as self-evident. She notes that this approach can explain the subjective certainty, or self-evident truth-ness, of delusional beliefs. She argued that delusions which arise in this way may reflect a lack of the normal capacity to inhibit (mis)perceptions. In the questions following her talk, Dr. Todd Woodward queried Dr. Langdon's use of the word inhibition, and suggested that the problem might be with heightened salience attached to the delusional content. They agreed that a more neutral term like 'stepping back' might be more appropriate. Dr. Langdon agreed that the terminology was not as important as trying to capture the concept being addressed in a model of delusions. Dr. Martin Harrow argued that delusions need not arise from altered perceptual experiences, and instead can result from a pure reasoning deficit. Much discussion followed on this point.

Dr. Stephan Heckers concluded the workshop on delusions by first discussing not only the importance of base rates of unusual beliefs in the healthy population, but also the importance of defining normal perception. He then reflected on the appeal of studying the nature of delusional belief, and posed the question, "What does it tell us about ourselves?" Dr. Heckers spoke about the philosophical allure of investigating the questions around what is *alien*. Additionally, he encouraged more rigorous investigations into etiology and treatment, especially in the context of development of the DSM-V and the potential inclusion of a risk syndrome for psychosis.

Drs. Marty Harrow, Emmanuelle Peters, Aaron Mishara, Iris Sommer, Mahesh Menon, Todd Woodward, Flavie Waters, Cyril D'Souza, Vinod Srihari, and others contributed to further discussions.

References

Maher, B. A. (1974). Delusional thinking and perceptual disorder. *Journal of Individual Psychology*, 30, 98-113.