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EDITORIAL

Integration and Development in Schizotypy Research: An Introduction to the Special Supplement

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In its fifth decade of existence, the construct of schizotypy is recapturing the early scientific interest it attracted when Paul E. Meehl (1920–2003), who coined the term, pioneered the field of schizotypy research. The International Lemanic Workshop on Schizotypy, hosted at the University of Geneva in December 2013, recently offered an opportunity to address some of the fundamental questions in contemporary schizotypy research and situate the construct in the greater scheme of future scientific projects on schizophrenia and psychological health research. What kind of knowledge has schizotypy research provided in furthering our understanding of schizophrenia? What types of questions can schizotypy research tackle, and which are the conceptual and methodological frameworks to address them? How will schizotypy research contribute to future scientific endeavors? The International Lemanic Workshop brought together leading experts in the field around the tasks of articulating the essential findings in schizotypy research, as well as providing some key insights and guidance to face scientific challenges of the future. The current supplement contains 8 position articles, 4 research articles, and 1 invited commentary that outline the state of the art in schizotypy research today.

> This neural integrative defect, which I shall christen schizotaxia, is all that can properly be spoken of as inherited. The imposition of a social learning history upon schizotaxic individuals results in a personality organization which I shall call, following Rado, the schizotype
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> Paul Meehl, 1962 (p. 830).[1]

> Has this been a fertile paradigm? I think the answer is absolutely yes… It has really stood the test of time well.
>
> Kenneth S. Kendler, 2013, 25th Association for Psychological Science Conference

"How does schizotypy really contribute to understanding schizophrenia and related disorders?" Following the pioneering work of Paul Meehl on the construct of schizotypy,[1] and much in the spirit of 1993's NATO scientific workshop on schizotypy in Italy, scientists in the field recently reunited at the University of Geneva, Switzerland, for the International Lemanic workshop on schizotypy (http://lemanicworkshop.wix.com/schizotypy). The workshop aimed to provide an integrative platform addressing the very basic question of what schizotypy represents and how it can meaningfully contribute to knowledge in the field of schizophrenia research and psychology.

Meehl was dedicated to investigate "the old European notion of an 'integrative neural defect' as the only direct phenotypic consequence produced by the genic mutation" [1(p829)]. Since his first report, Meehl and followers refined the construct of schizotypy,[2–5] while others expanded schizotypy research to the domain of psychometric personality psychology.[6–8] Irrespective of whether one is more or less influenced by either tradition, we argue that schizotypy is the most influential, comprehensive psychological construct in schizophrenia research, inspiring contemporary concepts such as endophenotypes[9] and at-risk mental states.[10] Its theoretical framework remains unique in that it articulates different levels of investigation, encompassing the nature-nurture debate, accounting for genetic, molecular, neuronal, and imaging studies, together with social, experimental, developmental, cognitive, and clinical psychological studies around a solid, multidimensional core of schizotypy dimensions. In providing a framework for these diverse topics, the construct of schizotypy helps to secure a basis for an integrated understanding

of pathology and health in schizophrenia spectrum manifestations.

For the past 50 years, however, researchers in the clinical domain have mainly followed *exclusive* research avenues. Methodologies tend to either focus on the molecular, neurophysiological, and environmental and cultural correlates of psychotic expression or investigate a variety of potential endophenotypes relating to schizophrenia. The evidence from schizotypy research is slowly yet steadily integrated into these fields. Indeed, as our special issue will outline, the evidence linking schizotypy to psychosis is both abundant and parceled.

This supplement provides a series of articles presenting the key contributions of the International Lemanic Workshop on Schizotypy. Specifically, the manuscripts bring forward the available data arguing that the schizotypy framework can play a decisive role in furthering the understanding of schizophrenia and related disorders but equally healthy human behavior and experience. The workshop was planned such that a priori major empirical domains were covered (assessment of schizotypy, biological and neurocognitive dimensions of schizotypy, development of schizotypy, and the integrative framework of schizotypy). The present supplement further includes 4 original studies illustrating the novel methodologies and insights gained through contemporary schizotypy research.

The first 2 articles of this special supplement of *Schizophrenia Bulletin* introduce the concept of schizotypy and how it can be assessed. Firstly, Kwapil and Barrantes-Vidal[11] provide a historical account on schizotypy research (including the debate about dimensional and taxonic models) and eschew fundamental principles and misconceptions in guiding future research on schizotypy. In particular, the authors argue that schizotypy represents a unifying construct that efficiently links a broad continuum of clinical and subclinical manifestations. Secondly, Mason[12] describes contemporary schizotypy assessment methods originating in clinical or psychometric personality tradition. His survey of schizotypy measurement tools additionally provides a guide to their application in scientific research.

The following 6 position articles outline the critical contributions of schizotypy research to understanding schizophrenic spectrum disorders and health. In the first of these articles, Debbané and Barrantes-Vidal[13] offer an explicit developmental model that situates schizotypy in the emerging domain of high-risk research and argue for the added value of a transactional, multidimensional examination of schizotypy during development. In the subsequent article, Debbané et al[14] provide a thorough review of the available prospective longitudinal studies examining the predictive value of schizotypy expression on the development of psychotic-spectrum disorders. Next, Barrantes-Vidal et al[15] propose a comprehensive overview on the etiological factors in schizotypy. The authors report on genetic, biological, and psychosocial measures that show an important overlap in schizotypy and schizophrenia, supporting the notion of phenomenological and etiological continuity in the schizophrenia spectrum. Yet, the authors also stress differential findings between schizotypy and schizophrenia that might help to identify potential protective factors to consider for schizotypy research. In the contribution by Ettinger et al,[16] the authors present a selective review on the cognitive and cerebral functional profiles one can observe in individuals reporting elevated schizotypy. Findings from the domains of perception, attention, memory, imagery and representation, language, and motor control show deficits that are similar, yet quantitatively milder, to those in patients with schizophrenia. The very fact that differences in schizotypy expression relate to variance in cognitive performance underlines the potential etiological insights that can be gained by studying subclinical, trait-level schizotypy. Furthermore, the authors point to 2 domains in which elevated schizotypy links to "superior" performance, ie, enhanced vividness and better performance on tasks of mental rotation. Mohr and Claridge[17] further contextualize these cognitive advantages. Here, the authors refer to healthy individuals with mainly positive psychotic-like traits (positive schizotypy, but also affective features mapping onto bipolar disorder), who may benefit from positive adaptations such as personal well-being, cognitive (mainly creative) abilities, and a favorable personality profile. The final article in this section by Cohen et al[18] complements the previous 2 contributions by focusing on the social and affective components in schizotypy. The authors offer a conceptual framework within which individual differences in healthy affective and social functions can be understood in the light of schizotypy expression. The authors further highlight the neurodevelopmental, neurobiological, and psychological underpinnings of affiliative drives, hedonic capacity, social cognition, and stress responsivity systems. Finally, they discuss the neural compensatory and resilience factors as well as schizotypy's potential role for understanding cultural determinants of social and affective functions.

In the final section, 4 cutting-edge studies illustrate recent examples of empirical schizotypy research. In the first study, Wang et al[19] provide an illustration of integrative research by combining structural neuroimaging to resting state functional connectivity analysis in revealing neurobiological changes specifically associated to schizotypy. Herzig et al[20] used a behavioral marker (functional hemispheric asymmetry for language) to investigate whether and how cannabis use along the schizophrenia spectrum (first episode patients, healthy individuals differing in schizotypy) links to aberrant performance. Everett and Linscott[21] present new evidence for a taxonic view of schizotypy through the longitudinal investigation

of psychiatric patients. Finally, Fonseca-Pedrero et al[22] report on an original experimental paradigm that suggests an observable association between early adolescent schizotypy expression and proneness to experience experimentally induced visual illusions.

In conclusion, Lenzenweger[23] provides an overarching commentary on the special issue and critically formulates important conceptual considerations as we envision the future of the field and its potential to integrate different levels of analyses in our understanding of psychotic disorders.

The 2013 International Lemanic Workshop on Schizotypy Research set the foundations for future collaborative research through the creation of the Consortium for International Schizotypy Research. The objective of this consortium is to provide a platform for data sharing encompassing psychometric, genetic, cognitive, and imaging domains. It further aims to provide new generations of scientists opportunities to integrate past insights to current and future scientific endeavors not only in the fields of schizotypy but also in schizophrenia research and health psychology more generally.

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References

1. Meehl PE. Schizotaxia, schizotypy, schizophrenia. *Am Psychol*. 1962;17:827–838.
2. Lenzenweger MF. Schizotaxia, schizotypy, and schizophrenia: Paul E. Meehl's blueprint for the experimental psychopathology and genetics of schizophrenia. *J Abnorm Psychol*. 2006;115:195–200.
3. Meehl PE. Toward an integrated theory of schizotaxia, schizotypy, and schizophrenia. *J Pers Disord*. 1990;4:1–99.
4. Meehl PE. What's in a taxon? *J Abnorm Psychol*. 2004;113:39–43.
5. Raine A, Green MF. Schizophrenia and schizotypal personality: a tribute to Peter H. Venables. *Schizophr Res*. 2002;54:1–5.
6. Bentall RP, Claridge GS, Slade PD. The multidimensional nature of schizotypal traits: a factor analytic study with normal subjects. *Br J Clin Psychol*. 1989;28(Pt 4):363–375.
7. Claridge G. Single indicator of risk for schizophrenia: probable fact or likely myth? *Schizophr Bull*. 1994;20:151–168.
8. Nelson MT, Seal ML, Pantelis C, Phillips LJ. Evidence of a dimensional relationship between schizotypy and schizophrenia: a systematic review. *Neurosci Biobehav Rev*. 2013;37:317–327.
9. Gottesman II, Gould TD. The endophenotype concept in psychiatry: etymology and strategic intentions. *Am J Psychiatry*. 2003;160:636–645.
10. Yung AR, McGorry PD. The prodromal phase of first-episode psychosis: past and current conceptualizations. *Schizophr Bull*. 1996;22:353–370.
11. Kwapil TR, Barrantes-Vidal N Schizotypy: looking back and moving forward. *Schizophr Bull*. 2015;41(suppl 2):S366–S373.
12. Mason OJ. The assessment of schizotypy and its clinical relevance. *Schizophr Bull*. 2015;41(suppl 2):S374–S385.
13. Debbané M, Barrantes-Vidal N. Schizotypy from a developmental perspective. *Schizophr Bull*. 2015;41(suppl 2): S386–S395.
14. Debbané M, Eliez S, Badoud D, Conus P, Flückiger R, Schultze-Lutter F. Developing psychosis and its risk states through the lens of schizotypy. *Schizophr Bull*. 2015;41(suppl 2):S396–S407.
15. Barrantes-Vidal N, Grant P, Kwapil TR. The role of schizotypy in the study of the etiology of schizophrenia-spectrum disorders. *Schizophr Bull*. 2015;41(suppl 2):S408–S416.
16. Ettinger U, Mohr C, Gooding DC, et al. Cognition and brain function in schizotypy: a selective review. *Schizophr Bull*. 2015;41(suppl 2):S417–S426.
17. Mohr C, Claridge G. Schizotypy—do not worry, it is not all worrisome. *Schizophr Bull*. 2015;41(suppl 2):S436–S443.
18. Cohen AS, Mohr C, Ettinger U, Chan RC, Park S. Schizotypy as an organizing framework for social and affective sciences. *Schizophr Bull*. 2015;41(suppl 2):S427–S435.
19. Wang Y, Yan C, Yin D, et al. Neurobiological changes of schizotypy: evidence from both volume-based morphometric analysis and resting-state functional connectivity. *Schizophr Bull*. 2015;41(suppl 2):S444–S454.
20. Herzig D, Sullivan S, Lewis G, et al. Hemispheric language asymmetry in first episode psychosis and schizotypy: the role of cannabis consumption and cognitive disorganization. *Schizophr Bull*. 2015;41(suppl 2):S455–S464.
21. Everett K, Linscott RJ. Dimensionality versus taxonicity of schizotypy: some new data and challenges ahead. *Schizophr Bull*. 2015;41(suppl 2):S465–S474.
22. Fonseca-Pedrero E, Badoud D, Antico L, et al. Strange-face-in-the-mirror illusion and schizotypy during adolescence. *Schizophr Bull*. 2015;41(suppl 2):S475–S482.
23. Lenzenweger MF. Thinking clearly about schizotypy: hewing to the schizophrenia liability core, considering interesting tangents, and avoiding conceptual quicksand. *Schizophr Bull*. 2015;41(suppl 2):S483–S491.