



Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:

Nelson, B;Torregrossa, L;Thompson, A;Sass, LA;Park, S;Hartmann, JA;McGorry, PD;Alvarez-Jimenez, M

Title:

Improving treatments for psychotic disorders: beyond cognitive behaviour therapy for psychosis

Date:

2020-06-21

Citation:

Nelson, B., Torregrossa, L., Thompson, A., Sass, L. A., Park, S., Hartmann, J. A., McGorry, P. D. & Alvarez-Jimenez, M. (2020). Improving treatments for psychotic disorders: beyond cognitive behaviour therapy for psychosis. *PSYCHOSIS-PSYCHOLOGICAL SOCIAL AND INTEGRATIVE APPROACHES*, 13 (1), pp.78-84. <https://doi.org/10.1080/17522439.2020.1742200>.

Persistent Link:

<https://hdl.handle.net/11343/250289>

**Improving treatments for psychotic disorders:  
Beyond cognitive behaviour therapy for psychosis**

Nelson, B.<sup>1,2\*</sup>, Torregrossa, L.<sup>3</sup>, Thompson, A.<sup>1,2</sup>, Sass, L.A.<sup>4</sup>, Park, S.<sup>3</sup>,  
Hartmann, J.A.<sup>1,2</sup>, McGorry, P.D.<sup>1,2</sup>, Alvarez-Jimenez, M.<sup>1,2</sup>

<sup>1</sup> Orygen, Parkville, Victoria, Australia

<sup>2</sup> Centre for Youth Mental Health, The University of Melbourne, Parkville, Victoria, Australia

<sup>3</sup> Department of Psychology, Vanderbilt University, USA

<sup>4</sup> Rutgers, The State University of New Jersey, USA

\* Corresponding author. Contact details: [Barnaby.Nelson@orygen.org.au](mailto:Barnaby.Nelson@orygen.org.au).

Current treatments for schizophrenia and other psychotic disorders have limited efficacy. Treatment guidelines for these disorders recommend the use of a second-generation antipsychotic medication, psychosocial support, and psychological treatment (i.e., cognitive-behaviour therapy for psychosis, CBT-P)(Galletly et al., 2016; E. P. G. W. Group, 2010; I. E. P. A. W. Group, 2005; Lehman et al., 2004; NICE, 2014). However, studies have repeatedly shown that at least a third of patients, possibly up to two thirds of patients (Samara, Nikolakopoulou, Salanti, & Leucht, 2019), will show inadequate response to antipsychotic medication (Andreasen et al., 2005; Kane, Honigfeld, Singer, & Meltzer, 1988; Lehman, et al., 2004). Psychological treatments do not fare much better (Jauhar, Laws, & McKenna, 2019; McKenna, Leucht, Jauhar, Laws, & Bighelli, 2019). A 2014 meta-analysis found end of treatment effect sizes that were uniformly in the small range (0.13-0.33)(Jauhar et al., 2014). A more recent network meta-analysis of various psychological interventions to reduce positive symptoms in schizophrenia again found pooled effect sizes for CBT in the small range (0.29-0.30)(Bighelli et al., 2018). A 2018 Cochrane Review concluded that there is *no clear and convincing advantage for CBT on any measure* apart from leaving the study early over other, and sometimes much less sophisticated and expensive, psychosocial therapies for people with schizophrenia (Jones et al., 2018).

Given the limited benefit of the existing recommended ‘gold standard’ treatments for people with psychotic disorders, it is clear that more effective treatments are urgently required for this patient population (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006; Neil, Carr, Mihalopoulos, Mackinnon, & Morgan, 2014). In this piece, we make three suggestions for overcoming the current impasse in treatment: 1. Targeting the core phenomenological features (‘phenomenological phenotype’ (Stanghellini and Rossi, 2014)) of the conditions in question, 2. Focusing on social disconnection, isolation and loneliness, and 3. Leveraging ‘hot’

cognitions and using ‘symptom capture’ approaches that combine CBT-P with advances in technology and neuroscience.

Although we recognise that one of the first reports of CBT was its use for psychosis (Beck, 1952), much of the development of this therapy has been geared towards the treatment of depression and anxiety. Based on reasonable success in these clinical domains, it was imported and transposed into the area of psychosis treatment (Fowler, Garety, & Kuipers, 1995; Kingdon and Turkington, 1994; Tai and Turkington, 2009). However, this was essentially a pragmatic move and influenced by the growing field at the time of cognitive models of psychosis, rather than a therapy that was developed in response to *characteristic phenomenological features* of psychotic disorders and possible associated pathogenic mechanisms. We have recently argued that close examination of a psychiatric disorder’s phenomenological phenotype is required in order to direct research into mechanisms of disorder onset and integrate levels of analysis (Nelson et al., 2019). The same could be argued with regard to treatment. That is, rather than mechanically applying whatever happens to be the dominant psychotherapeutic approach (in this case, CBT), treatment should be selected to match phenomenology. A substantial body of theoretical and empirical research has now accumulated indicating that a core phenomenological feature of schizophrenia spectrum conditions is a self-disorder marked by structural distortions of subjectivity and consciousness (Nelson, Parnas, & Sass, 2014; Parnas and Zandersen, 2018). This basic self-disturbance is associated with a range of mutually implicating anomalous subjective experiences such as diminished sense of presence or inner nucleus, hyperreflexivity, diminished sense of ownership and agency of experience and action, dissociation and derealisation, and ‘common sense’ disturbances.

A therapy that targets these features may be most relevant to patients and be more effective than traditional CBT-P given its engagement of core phenomenological features. We advocate the development and testing of such an approach. Although the precise nature of this therapy remains to be clarified, core components have already been identified. These include:

- An emphasis on the *overall framework of altered experience rather than on specific contents of cognition* (i.e., sometimes referred to as a focus on form/structure over content (Sass, 2019)). An example would be privileging the recognition and discussion of a ‘background’ delusional mood over challenging specific paranoid thoughts.
- The value of *implicit and nonverbal intersubjective experience* rather than overemphasising the relevance and need for direct interpersonal interaction (Sass, 2019). As recently suggested (Nischk and Rusch, 2019), this may be an element of the Soteria approach to acute psychosis treatment that contributes to its effectiveness and appeal to patients, i.e. a community-based social milieu that emphasises personal relationships (“being-with”) and meaningful shared activities (“doing-with”) over direct verbal discussion about mental state and symptoms.
- Developing and supporting *a more robust sense of self-presence*. It has been suggested elsewhere (Nelson, Sass, & Skodlar, 2009; Skodlar and Henriksen, 2019) that helpful strategies to achieve this include body-oriented strategies (e.g., physical activities, mindfulness, yoga, movement and music therapies (Geretsegger et al., 2017; Mehta, Keshavan, & Gangadhar, 2016; Mittal et al., 2017; Priebe et al., 2016)) and immersive activity (e.g., simulation, ‘flow’ states (Csikszentmihalyi, 1990, 1996)). These may cultivate a ‘dereflection’, i.e., a reduction in excessive analysis, reflection and anxious awareness, and stronger sense of embodiment (Skodlar and Henriksen, 2019). Interoceptive processes, which have been found to be disturbed in schizophrenia, may play a crucial role in sense of presence (Allen and Tsakiris, 2018; Seth, 2016; Seth, Suzuki, & Critchley, 2011). Physical exercise may be a means of increasing

implicit interoceptive and proprioceptive awareness. It is also noteworthy that a key feature of Virtual Reality (VR) paradigms is to maximise sense of presence or immersion in the virtual environment. If this could be maximised in the virtual environment, then features that contribute to this effect could be identified together with the patient so that they could possibly be drawn on and utilised in normal self-world experience. The ‘transfer effect’ from VR to real environments is critical to achieve a sustained impact on disturbances of self-presence in psychotic disorders. In a recent feasibility study using VR to train social attention, we found medium to strong effect sizes for symptom reduction following 10 training sessions (Adery et al., 2018). Interestingly, we also found that emotional embodiment improved following training, highlighting the potential role of VR in addressing bodily self-disturbances.

Secondly, we argue that is also essential to address the self-other/self-world relationship in order to improve functional outcomes and quality of life. Indeed, self-experience and interpersonal/social experience are intimately intertwined (Nelson et al., 2009; Ratcliffe, 2017; Sass, Borda, Madeira, Pienkos, & Nelson, 2018). The phenomenology of psychotic conditions is marked by perceived social disconnection, isolation, and/or loneliness (Treméau, Antonius, Malaspina, Goff, & Javitt, 2016) and the *DSM-V* describes avolition (which can be associated with asociality, “an apparent lack in social interactions”) as a core negative symptom of schizophrenia (Association, 2013). Notably, objective social isolation and disconnection have been found to significantly impact the quality of life of those affected (Green et al., 2018). In addition, social isolation has been shown to induce schizophrenia-like behaviour in animal models (Li et al., 2017). Perceived and objective social isolation (and related constructs of social defeat (Selten, van der Ven, Rutten, & Cantor-Graae, 2013) and marginalisation (Morgan, Charalambides, Hutchinson, & Murray, 2010)) are not only risk factors for schizophrenia, they are also core symptoms for those already affected by the illness and predict

overall outcome. Thus, social isolation and loneliness are essential targets for treatment. Two approaches to reducing social isolation are improving social skills and tailored online social media. With regard to the former, VR is again an excellent candidate as it allows for controllability of the environment and repeated practice, which are key ingredients for learning. Several studies have already shown the efficacy of VR for improving social skills in schizophrenia (e.g., Adery, et al., 2018; Rus-Calafell, Gutierrez-Maldonado, & Ribas-Sabate, 2014; Tsang and Man, 2013). Specifically designed online social media has also been found to reduce social isolation and increase meaningful social connections in patients with psychosis (Alvarez-Jimenez et al., 2014; Alvarez-Jimenez et al., 2018).

A third suggestion is that even if treatments do not target putative core phenomenological features, as suggested above, CBT-P could be enhanced and combined with other elements to maximise its effectiveness. One of the rate-limiting factors for CBT may be that it tends to rely on a considerable degree of abstract self-reflection (e.g., identifying and challenging the triad of negative view of self, others and the future (Beck, Himelstein, & Grant, 2019)) and can therefore be divorced from the actual *in-vivo* experience of symptoms. Such reflection also has the potential to exacerbate the hyperreflexivity that may be central to the pathology itself (Nelson, Sass, & Skodlar, 2009; Skodlar, Henriksen, Sass, Nelson, & Parnas, 2013). The efficacy of CBT may be enhanced if applied *during symptom activation* (referred to as a ‘symptom capture’ approach (Jardri, Pouchet, Pins, & Thomas, 2011)), i.e., addressing ‘hot’ versus ‘cold’ cognitions (Roiser and Sahakian, 2013). This approach has been applied with good effect to anxiety disorders and obsessive-compulsive disorder, using exposure and response prevention paradigms. Again, VR paradigms may be useful to achieve this aim (Freeman et al., 2016; Pot-Kolder et al., 2018), as has been conducted to some extent with

Avatar therapy (Leff, Williams, Huckvale, Arbuthnot, & Leff, 2013). VR would allow the development and application of flexible and personalised exposure hierarchies.<sup>a</sup>

The utility of this approach may be further augmented if combined with bio- or neurofeedback that provides real time feedback to patients on their biological and/or neural activity (e.g., heart rate variability, electrophysiological patterns) in order for them to modulate this activity during symptom activation. There is proof-of-concept evidence for this treatment approach in psychosis (Bolea, 2010; Cordes et al., 2015; Gruzelier, Hardman, Wild, & Zaman, 1999; Nan et al., 2017; Orlov et al., 2018; Ruiz et al., 2013; Surmeli, Ertem, Eralp, & Kos, 2012). Again, the transfer effect to everyday life should of course be a key treatment goal. Combining treatment components in this way may not only engage multiple treatment targets and possible pathogenic mechanisms (psychological, neurophysiological, neurobiological) simultaneously, but is also likely to have a synergistic effect through the *interaction* of the individual treatment components. For example, real-time bio/neurofeedback provided to patients and therapists in response to VR exercises would *feed into* the content of CBT, because the patient and therapist would be able to discuss the direct impact the exposure exercises are having on the patient in an immediate, non-retrospective fashion, preserving the benefits of dealing with ‘hot’ cognitive and affective reactions. In turn, CBT may assist the patient in developing strategies for modulating their bio/neural activity in response to the VR exposure paradigms. The neurofeedback component may also increase a sense of self-efficacy, given that it is grounded in patients developing self-directed, endogenous control over their symptoms. In this way, the combined effect of such an integrated intervention (CBT-P, VR, bio- or neurofeedback) may be greater than the sum of the effects of its individual components.

---

<sup>a</sup> Ecological Momentary Interventions (EMI) delivered by mobile-based interventions can also be used to capture symptoms and cognitions in daily life, providing a promising approach to enhance the effect of traditional CBT in psychosis treatment (Reininghaus, Depp, & Myin-Germeys, 2016).

Similarly, blended models of care integrating real time assessments (ecological momentary assessments, passive sensing (Insel, 2018)) and interventions (EMI (Reininghaus, et al., 2016)) with face to face CBT therapy, can yield treatment effects which surpass those of their individual components. For example, real time CBT strategies can be tailored based on individual response using therapist input and machine learning and adapted to time and context via passive sensing technology (e.g., delivering cognitive strategies in specific locations).

To summarise, there is a need for treatments that foster a more robust basic selfhood, that improve self-other/world functioning, and that integrate learnings from psychological treatment of other conditions (e.g., the benefit of dealing with ‘hot’ cognitions) with advances in technology and neuroscience. Existing mainstream treatments and those suggested here are not mutually exclusive or incompatible with each other. CBT-P remains a useful tool, but other strategies need to be further explored in order to provide more effective *types* of treatments and to augment the benefits of those already available. Rather than relying exclusively on top-down cognitive approaches, the treatment of psychotic disorders may need to engage multiple targets simultaneously and aim to put the self back into the body and also the person back into society.

## References

- Adery, L. H., Ichinose, M., Torregrossa, L. J., Wade, J., Nichols, H., Bekele, E., . . . Park, S. (2018). The acceptability and feasibility of a novel virtual reality based social skills training game for schizophrenia: Preliminary findings. *Psychiatry Res*, *270*, pp. 496-502. doi:10.1016/j.psychres.2018.10.014 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30326433>
- Allen, M., & Tsakiris, M. (2018). The body as first prior: Interoceptive predictive processing and the primacy of self-models *The Interoceptive Mind: From Homeostasis to Awareness*: Oxford Scholarship Online.
- Alvarez-Jimenez, M., Alcazar-Corcoles, M. A., Gonzalez-Blanch, C., Bendall, S., McGorry, P. D., & Gleeson, J. F. (2014). Online, social media and mobile technologies for psychosis treatment: a systematic review on novel user-led interventions. *Schizophr Res*, *156*(1), pp. 96-106. doi:10.1016/j.schres.2014.03.021 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24746468>
- Alvarez-Jimenez, M., Gleeson, J. F., Bendall, S., Penn, D. L., Yung, A. R., Ryan, R. M., . . . Nelson, B. (2018). Enhancing social functioning in young people at Ultra High Risk (UHR) for psychosis: A pilot study of a novel strengths and mindfulness-based online social therapy. *Schizophr Res*, *202*, pp. 369-377. doi:10.1016/j.schres.2018.07.022 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30031616>
- Andreasen, N. C., Carpenter, W. T., Jr., Kane, J. M., Lasser, R. A., Marder, S. R., & Weinberger, D. R. (2005). Remission in schizophrenia: proposed criteria and rationale for consensus.[see comment]. *American Journal of Psychiatry*, *162*(3), pp. 441-449.
- Association, A. P. (2013). *Diagnostic and Statistical Manual of Mental Disorders. Fifth Edition*. Arlington, VA: American Psychiatric Association.
- Beck, A. T. (1952). Successful outpatient psychotherapy of a chronic schizophrenic with a delusion based on borrowed guilt. *Psychiatry*, *15*(3), pp. 305-312. doi:10.1080/00332747.1952.11022883 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/12983446>
- Beck, A. T., Himelstein, R., & Grant, P. M. (2019). In and out of schizophrenia: Activation and deactivation of the negative and positive schemas. *Schizophr Res*, *203*, pp. 55-61. doi:10.1016/j.schres.2017.10.046 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29169775>
- Bighelli, I., Salanti, G., Huhn, M., Schneider-Thoma, J., Krause, M., Reitmeir, C., . . . Leucht, S. (2018). Psychological interventions to reduce positive symptoms in schizophrenia: systematic review and network meta-analysis. *World Psychiatry*, *17*(3), pp. 316-329. doi:10.1002/wps.20577 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30192101>
- Bolea, A. S. (2010). Neurofeedback treatment of chronic inpatient schizophrenia. *Journal of Neurotherapy*, *14*(1), pp. 47-54.
- Cordes, J. S., Mathiak, K. A., Dyck, M., Alawi, E. M., Gaber, T. J., Zepf, F. D., . . . Mathiak, K. (2015). Cognitive and neural strategies during control of the anterior cingulate cortex by fMRI neurofeedback in patients with schizophrenia. *Front Behav Neurosci*,

- 9, p 169. doi:10.3389/fnbeh.2015.00169 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/26161073>
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience* New York: Harper Collins.
- Csikszentmihalyi, M. (1996). *Creativity* New York: HarperCollins.
- Fowler, D., Garety, P. A., & Kuipers, A. (1995). *Cognitive behaviour therapy for psychosis: Theory and practice* Chichester, UK: Wiley.
- Freeman, D., Bradley, J., Antley, A., Bourke, E., DeWeever, N., Evans, N., . . . Clark, D. M. (2016). Virtual reality in the treatment of persecutory delusions: randomised controlled experimental study testing how to reduce delusional conviction. *Br J Psychiatry*, 209(1), pp. 62-67. doi:10.1192/bjp.bp.115.176438 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/27151071>
- Galletly, C., Castle, D., Dark, F., Humberstone, V., Jablensky, A., Killackey, E., . . . Tran, N. (2016). Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for the management of schizophrenia and related disorders. *Aust N Z J Psychiatry*, 50(5), pp. 410-472. doi:10.1177/0004867416641195 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/27106681>
- Geretsegger, M., Mossler, K. A., Bieleninik, L., Chen, X. J., Heldal, T. O., & Gold, C. (2017). Music therapy for people with schizophrenia and schizophrenia-like disorders. *Cochrane Database Syst Rev*, 5, p CD004025. doi:10.1002/14651858.CD004025.pub4 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/28553702>
- Green, M. F., Horan, W. P., Lee, J., McCleery, A., Reddy, L. F., & Wynn, J. K. (2018). Social Disconnection in Schizophrenia and the General Community. *Schizophr Bull*, 44(2), pp. 242-249. doi:10.1093/schbul/sbx082 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/28637195>
- Group, E. P. G. W. (2010). *Australian Clinical Guidelines for Early Psychosis*. Melbourne: Orygen Youth Health.
- Group, I. E. P. A. W. (2005). International clinical practice guidelines for early psychosis. *British Journal of Psychiatry*, 187(supplement 48), pp. s120-s124.
- Gruzelier, J., Hardman, E., Wild, J., & Zaman, R. (1999). Learned control of slow potential interhemispheric asymmetry in schizophrenia. *International journal of psychophysiology : official journal of the International Organization of Psychophysiology*, 34(3), pp. 341-348. doi:10.1016/s0167-8760(99)00091-4 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/10610058>
- Insel, T. R. (2018). Digital phenotyping: a global tool for psychiatry. *World Psychiatry*, 17(3), pp. 276-277. doi:10.1002/wps.20550 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30192103>
- Jardri, R., Pouchet, A., Pins, D., & Thomas, P. (2011). Cortical activations during auditory verbal hallucinations in schizophrenia: a coordinate-based meta-analysis. *Am J Psychiatry*, 168(1), pp. 73-81. doi:10.1176/appi.ajp.2010.09101522 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/20952459>
- Jauhar, S., Laws, K. R., & McKenna, P. J. (2019). CBT for schizophrenia: a critical viewpoint. *Psychol Med*, 49(8), pp. 1233-1236. doi:10.1017/S0033291718004166 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30757979>
- Jauhar, S., McKenna, P. J., Radua, J., Fung, E., Salvador, R., & Laws, K. R. (2014). Cognitive-behavioural therapy for the symptoms of schizophrenia: systematic review and meta-analysis with examination of potential bias. *Br J Psychiatry*, 204(1), pp. 20-29.

- doi:10.1192/bjp.bp.112.116285 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24385461>
- Jones, C., Hacker, D., Meaden, A., Cormac, I., Irving, C. B., Xia, J., . . . Chen, J. (2018). Cognitive behavioural therapy plus standard care versus standard care plus other psychosocial treatments for people with schizophrenia. *Cochrane Database Syst Rev*, 11, p CD008712. doi:10.1002/14651858.CD008712.pub3 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30480760>
- Kane, J. M., Honigfeld, G., Singer, J., & Meltzer, H. (1988). Clozapine in treatment-resistant schizophrenics. *Psychopharmacol Bull*, 24(1), pp. 62-67. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/3290950>
- Kingdon, D., & Turkington, D. (1994). *Cognitive-behavioural therapy for schizophrenia* Hove, UK: Lawrence Erlbaum.
- Leff, J., Williams, G., Huckvale, M. A., Arbuthnot, M., & Leff, A. P. (2013). Computer-assisted therapy for medication-resistant auditory hallucinations: proof-of-concept study. *Br J Psychiatry*, 202, pp. 428-433. doi:10.1192/bjp.bp.112.124883 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/23429202>
- Lehman, A. F., Lieberman, J. A., Dixon, L. B., McGlashan, T. H., Miller, A. L., Perkins, D. O., . . . Steering Committee on Practice, G. (2004). Practice guideline for the treatment of patients with schizophrenia, second edition. *Am J Psychiatry*, 161(2 Suppl), pp. 1-56. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/15000267>
- Li, B. J., Liu, P., Chu, Z., Shang, Y., Huan, M. X., Dang, Y. H., & Gao, C. G. (2017). Social isolation induces schizophrenia-like behavior potentially associated with HINT1, NMDA receptor 1, and dopamine receptor 2. *Neuroreport*, 28(8), pp. 462-469. doi:10.1097/WNR.0000000000000775 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/28410269>
- Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. L. (Eds.). (2006). *Global Burden of Disease and Risk Factors*. New York: Oxford University Press.
- McKenna, P., Leucht, S., Jauhar, S., Laws, K., & Bighelli, I. (2019). The controversy about cognitive behavioural therapy for schizophrenia. *World Psychiatry*, 18(2), pp. 235-236. doi:10.1002/wps.20636 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/31059624>
- Mehta, U. M., Keshavan, M. S., & Gangadhar, B. N. (2016). Bridging the schism of schizophrenia through yoga-Review of putative mechanisms. *Int Rev Psychiatry*, 28(3), pp. 254-264. doi:10.1080/09540261.2016.1176905 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/27187680>
- Mittal, V. A., Vargas, T., Osborne, K. J., Dean, D., Gupta, T., Ristanovic, I., . . . Shankman, S. A. (2017). Exercise Treatments for Psychosis: A Review. *Curr Treat Options Psychiatry*, 4(2), pp. 152-166. doi:10.1007/s40501-017-0112-2 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29034144>
- Morgan, C., Charalambides, M., Hutchinson, G., & Murray, R. M. (2010). Migration, ethnicity, and psychosis: toward a sociodevelopmental model. *Schizophr Bull*, 36(4), pp. 655-664. doi:10.1093/schbul/sbq051 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/20513653>
- Nan, W., Wan, F., Chang, L., Pun, S. H., Vai, M. I., & Rosa, A. (2017). An Exploratory Study of Intensive Neurofeedback Training for Schizophrenia. *Behav Neurol*, 2017, p 6914216. doi:10.1155/2017/6914216 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/28701821>

- Neil, A. L., Carr, V. J., Mihalopoulos, C., Mackinnon, A., & Morgan, V. A. (2014). Costs of psychosis in 2010: findings from the second Australian National Survey of Psychosis. *Aust N Z J Psychiatry*, *48*(2), pp. 169-182. doi:10.1177/0004867413500352 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24097844>
- Nelson, B., Lavoie, S., Gaweda, L., Li, E., Sass, L. A., Koren, D., . . . Whitford, T. J. (2019). Testing a neurophenomenological model of basic self disturbance in early psychosis. *World Psychiatry*, *18*(1), pp. 104-105. doi:10.1002/wps.20597 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/30600614>
- Nelson, B., Parnas, J., & Sass, L. A. (2014). Disturbance of minimal self (ipseity) in schizophrenia: clarification and current status. *Schizophr Bull*, *40*(3), pp. 479-482. doi:10.1093/schbul/sbu034 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24619534>
- Nelson, B., Sass, L. A., & Skodlar, B. (2009). The phenomenological model of psychotic vulnerability and its possible implications for psychological interventions in the ultra-high risk ('prodromal') population. *Psychopathology*, *42*, pp. 283-292.
- Nelson, B., Sass, L. A., Thompson, A., Yung, A. R., Francey, S. M., Amminger, G. P., & McGorry, P. D. (2009). Does disturbance of self underlie social cognition deficits in schizophrenia and other psychotic disorders? [Research Support, Non-U.S. Gov't Review]. *Early Interv Psychiatry*, *3*(2), pp. 83-93. doi:10.1111/j.1751-7893.2009.00112.x Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/21352181>
- NICE. (2014). *Psychosis and schizophrenia in adults: Treatment and management. National clinical guideline number 178*. London: National Collaborating Centre for Mental Health/National Institute for Health and Care Excellence.
- Nischk, D., & Rusch, J. (2019). What Makes Soteria Work? On the Effect of a Therapeutic Milieu on Self-Disturbances in the Schizophrenia Syndrome. *Psychopathology*, *52*(4), pp. 213-220. doi:10.1159/000501816 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/31390648>
- Orlov, N. D., Giampietro, V., O'Daly, O., Lam, S. L., Barker, G. J., Rubia, K., . . . Allen, P. (2018). Real-time fMRI neurofeedback to down-regulate superior temporal gyrus activity in patients with schizophrenia and auditory hallucinations: a proof-of-concept study. *Transl Psychiatry*, *8*(1), p 46. doi:10.1038/s41398-017-0067-5 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29430009>
- Parnas, J., & Zandersen, M. (2018). Self and schizophrenia: current status and diagnostic implications. *World Psychiatry*, *17*(2), pp. 220-221. doi:10.1002/wps.20528 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29856572>
- Pot-Kolder, R. M. C. A., Geraets, C. N. W., Veling, W., van Beilen, M., Staring, A. B. P., Gijssman, H. J., . . . van der Gaag, M. (2018). Virtual-reality-based cognitive behavioural therapy versus waiting list control for paranoid ideation and social avoidance in patients with psychotic disorders: a single-blind randomised controlled trial. *The Lancet Psychiatry*, *5*(3), pp. 217-226. doi:10.1016/s2215-0366(18)30053-1 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29429948>
- Priebe, S., Savill, M., Wykes, T., Bentall, R. P., Reininghaus, U., Lauber, C., . . . Rohricht, F. (2016). Effectiveness of group body psychotherapy for negative symptoms of schizophrenia: multicentre randomised controlled trial. *Br J Psychiatry*, *209*(1), pp. 54-61. doi:10.1192/bjp.bp.115.171397 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/27151073>

- Ratcliffe, M. (2017). Selfhood, schizophrenia, and the interpersonal regulation of experience. In C. Durt, T. Fuchs & C. Tewes (Eds.), *Embodiment, Enaction, and Culture: Investigating the Constitution of the Shared World* (pp. 149-172). Cambridge, Massachusetts: The MIT Press.
- Reininghaus, U., Depp, C. A., & Myin-Germeys, I. (2016). Ecological Interventionist Causal Models in Psychosis: Targeting Psychological Mechanisms in Daily Life. *Schizophr Bull*, 42(2), pp. 264-269. doi:10.1093/schbul/sbv193 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/26707864>
- Roiser, J. P., & Sahakian, B. J. (2013). Hot and cold cognition in depression. *CNS Spectr*, 18(3), pp. 139-149. doi:10.1017/S1092852913000072 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/23481353>
- Ruiz, S., Lee, S., Soekadar, S. R., Caria, A., Veit, R., Kircher, T., . . . Sitaram, R. (2013). Acquired self-control of insula cortex modulates emotion recognition and brain network connectivity in schizophrenia. *Hum Brain Mapp*, 34(1), pp. 200-212. doi:10.1002/hbm.21427 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/22021045>
- Rus-Calafell, M., Gutierrez-Maldonado, J., & Ribas-Sabate, J. (2014). A virtual reality-integrated program for improving social skills in patients with schizophrenia: a pilot study. *J Behav Ther Exp Psychiatry*, 45(1), pp. 81-89. doi:10.1016/j.jbtep.2013.09.002 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24063993>
- Samara, M. T., Nikolakopoulou, A., Salanti, G., & Leucht, S. (2019). How Many Patients With Schizophrenia Do Not Respond to Antipsychotic Drugs in the Short Term? An Analysis Based on Individual Patient Data From Randomized Controlled Trials. *Schizophr Bull*, 45(3), pp. 639-646. doi:10.1093/schbul/sby095 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29982701>
- Sass, L. (2019). Three Dangers: Phenomenological Reflections on the Psychotherapy of Psychosis. *Psychopathology*, 52(2), pp. 126-134. doi:10.1159/000500012 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/31163447>
- Sass, L., Borda, J. P., Madeira, L., Pienkos, E., & Nelson, B. (2018). Varieties of Self Disorder: A Bio-Pheno-Social Model of Schizophrenia. *Schizophr Bull*, 44(4), pp. 720-727. doi:10.1093/schbul/sby001 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29529266>
- Selten, J. P., van der Ven, E., Rutten, B. P., & Cantor-Graae, E. (2013). The social defeat hypothesis of schizophrenia: an update. *Schizophr Bull*, 39(6), pp. 1180-1186. doi:10.1093/schbul/sbt134 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24062592>
- Seth, A. K. (2016). Infer yourself: Interoception and internal "action" in conscious selfhood. *Behav Brain Sci*, 39, p e196. doi:10.1017/S0140525X15002265 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/28355805>
- Seth, A. K., Suzuki, K., & Critchley, H. D. (2011). An interoceptive predictive coding model of conscious presence. *Front Psychol*, 2, p 395. doi:10.3389/fpsyg.2011.00395 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/22291673>
- Skodlar, B., & Henriksen, M. G. (2019). Toward a Phenomenological Psychotherapy for Schizophrenia. *Psychopathology*, 52(2), pp. 117-125. doi:10.1159/000500163 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/31163426>
- Skodlar, B., Henriksen, M. G., Sass, L. A., Nelson, B., & Parnas, J. (2013). Cognitive-behavioral therapy for schizophrenia: a critical evaluation of its theoretical framework from a

- clinical-phenomenological perspective. *Psychopathology*, 46(4), pp. 249-265. doi:10.1159/000342536 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/23038150>
- Stanghellini, G., & Rossi, R. (2014). Pheno-phenotypes: a holistic approach to the psychopathology of schizophrenia. *Curr Opin Psychiatry*, 27(3), pp. 236-241. doi:10.1097/YCO.0000000000000059 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/24613980>
- Surmeli, T., Ertem, A., Eralp, E., & Kos, I. H. (2012). Schizophrenia and the efficacy of qEEG-guided neurofeedback treatment: a clinical case series. *Clinical EEG and neuroscience : official journal of the EEG and Clinical Neuroscience Society*, 43(2), pp. 133-144. doi:10.1177/1550059411429531 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/22715481>
- Tai, S., & Turkington, D. (2009). The evolution of cognitive behavior therapy for schizophrenia: current practice and recent developments. *Schizophr Bull*, 35(5), pp. 865-873. doi:10.1093/schbul/sbp080 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/19661198>
- Tremeau, F., Antonius, D., Malaspina, D., Goff, D. C., & Javitt, D. C. (2016). Loneliness in schizophrenia and its possible correlates. An exploratory study. *Psychiatry Res*, 246, pp. 211-217. doi:10.1016/j.psychres.2016.09.043 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/27721059>
- Tsang, M. M., & Man, D. W. (2013). A virtual reality-based vocational training system (VRVTS) for people with schizophrenia in vocational rehabilitation. *Schizophr Res*, 144(1-3), pp. 51-62. doi:10.1016/j.schres.2012.12.024 Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/23356951>