Research Article ISSN 2641-4317

International Journal of Psychiatry Research

The Psychodynamic Pentapointed Cognitive Construct (PPCC) Theory and Model Revisited: Cognitive Neuroscience Relating Psychoanalytic Data to Neurophysiology in the Treatment of Schizophrenia and Schizoaffective Disorder

Dr. Gillian Steggles MB.BS, MSc, PhD, AMInstLM*

University College London Alumna, London.
ORCIDID: 0000-0001-5670-2931

***Correspondence:**
Dr. Gillian Steggles MB.BS, MSc, PhD, AMInstLM, University College London Alumna, 54 Temple Avenue, Whetstone, London.

Received: 19 Apr 2026; **Accepted:** 20 May 2026; **Published:** 30 May 2026

Citation: Gillian Steggles. The Psychodynamic Pentapointed Cognitive Construct (PPCC) Theory and Model Revisited: Cognitive Neuroscience Relating Psychoanalytic Data to Neurophysiology in the Treatment of Schizophrenia and Schizoaffective Disorder . Int J Psychiatr Res. 2026; 9(3); 1-13.

ABSTRACT

The Psychodynamic Pentapointed Cognitive Construct (PPCC) model, first described as representing the process of recovery of a schizoaffectively disordered mind [1], is revisited here regarding its potential usefulness: from being simply a model of the therapeutic consultation practised in the psychoanalytic psychotherapy of schizophrenia and schizoaffective disorder, to being a resource for Psychiatric and Psychoanalytic studies. This paper describes briefly this model's development, and its subsequent potential usefulness to both Psychiatric and Psychoanalytic knowledge through the practice of successful clinical treatment of schizophrenia and schizoaffective disorder. The model was developed during the psychoanalytic psychotherapy of a 28 year old woman. Its four patient variables were confirmed 24 years later in a Psychiatry textbook as being seminal to psychoanalytic theories. The model was cognitively structured, and then applied to examining the clinical therapeutic relationship. Cognitive neuroscience offers understanding of the illnesses' psychopathology which the model will employ to help guide treatment potentially on an individual basis. If a patient's history and symptoms are entered into the model, patterns and information may emerge; if analysed, conclusions may be reached about features of the individual patient, or about the commonality of features in epidemiological studies of patients suffering from schizophrenic or schizoaffective illness. It therefore offers very versatile applications, for example, illustrating contrasts between a patient's mind prior to, and when undertaking psychoanalytic psychotherapy. The PPCC model's veracity has been studied and the methodology of developing it provided, for it to be used as a research tool in qualitative or epidemiological research.

Keywords

Schizophrenia, Schizoaffective disorder, Psychoanalytic psychotherapy, Cognitive neuroscience, PPCC model, Medication, Resolution.

Introduction

The PPCC theory states that the qualities of the human mind's functioning may be illustrated by geometric representations. The particular quality of the human mind's functioning represented by the PPCC's geometric model is the Representational World, a quality found particularly in a child's mind conceived of by Professor Joseph Sandler and Bernard Rosenblatt in 1962 [2]. The PPCC model describes both a single encounter between a Psychiatry-trained Psychoanalyst and a psychotic analysand (patient) during a psychoanalytic psychotherapy session, and the consequent overall sequence of a schizophrenic or schizoaffective mind attaining mental health through psychoanalytic psychotherapy. The PPCC theory and model were developed in 2012 [1] from early data obtained from a 28 year old schizoaffective woman who, during psychoanalytic psychotherapy, had observed and written down a sequence of ideas that flowed uninterrupted from her mind when stilled, until it ceased. An entire unit of thought, which formed her representational world [2] as an adult, reflected her initial mental perspective at that time, followed by others later during her

lifetime. The representational world is a concept conceived of by Professor Joseph Sandler and Bernard Rosenblatt as a preconscious structure in a child's mind that accumulates significant aspects of the previous environments experienced by the child, and acts as a guide for them in negotiating future unknown environments. It is held that the PPCC model utilizes the representational world persisting in the preconscious mind of adults, as they adapt to fresh experiences. The data occurred naturally in 5 groups, separated by pauses in the flow of ideas. The 5 groups were given headings that were observed independently 24 years later as being 4 variables containing data, derived from psychoanalytic treatments, which are used in psychoanalytic theories, and the overseeing variable of the therapeutically directing Analyst.

The variables were assembled as a model, the psychodynamic pentapointed cognitive construct (PPCC) model.

Aims

The aims of this paper are to describe the development of the PPCC model and then to demonstrate its potential usefulness to the clinical treatment of patients suffering from schizophrenia and schizoaffective disorder.

This model may be applied to any patient with these illnesses by entering details of their clinical history under the relevant variable. Its construction from the 4 categories or variables referred to in a Psychiatry textbook [3] as including the main parts of the mind discussed in psychoanalytic theories, together with the addition of the Analyst variable, renders its usefulness nearly limitless. Almost any aspect of a patient would fall into one or another variable as a category and, from its links with other aspects, symptoms and features of their mind might be seen as psychological connections. It may, for example, compare a patient's mental state at the start of, and during progress in, her psychoanalytic psychotherapeutic treatment. In this way, the model's usefulness might contribute to a helpful outcome for a clinician or to a study.

Methodology

The scientific methodology used in developing the model as a research tool followed established guidelines for qualitative research [4] and comprises the following elements:

a) This paper does not address or reduce its qualitative data to numerical terminology; it relates its data forming a model of schizoaffective disorder, the PPCC model, to qualitative clinical findings from a different perspective.

b) Understanding is not assumed simply from the patients' superficial behaviour and beliefs. This paper shows how schizophrenic and schizoaffective patients' minds may be analysed psychologically by understanding them consciously and unconsciously. This addresses particularly their dysphoria and confusion experienced in their early environment. Psychoanalysis has been described as depth psychology.

c) The PPCC model originally captured the sample contents of a patient's mind at one instant, consisting of the patient's accumulated experiences, before further thought occurs: a specific psychological observation. This was then extended to represent the psychodynamics of the therapeutic session between a psychoanalyst and an analysand (patient). It may be adapted clinically to illustrate the representational world of a schizophrenic or schizoaffective patient.

d) The psychological observation of the original schizoaffective patient, a small dataset, can be examined and used as a research tool for understanding schizophrenic patients better, via their dysphoric and confused internal world. This approach, using patients' intense experiences of their successive unhappy environments from childhood onwards, may be used in this way and more widely by working analytic practices. Currently, experienced Paediatric Psychiatrists diagnose which children are likely to be at risk from schizophrenia after dysphoric and confusing family experiences.

e) This paper's analytic model, the PPCC model [1], can be used to analyse dynamically patients' observed qualitative data when applied to it, and will be straightforward to set up on computer software.

f) This methodology has been quite widely published [1,5-17].

g) Limitations: This original observational qualitative research is on a very small scale, ie. it studies only 19 patients; but it has a low and therefore good NNT, the number needed to treat for a successful outcome (only 2). Also, large sums of money are required to complete treatment even though the financial and humanitarian costs of not treating a patient's schizophrenia are greater.

History of the model

i. Development from psychoanalytic processes: The model was developed from data as the original patient's representational world, which was obtained during her first, Kleinian, psychoanalysis.

ii. Application of the model's cognitive psychology: The model depicts the therapeutic dyad of any schizophrenic or schizoaffective patient as a tool for understanding the mechanism of psychoanalytic psychotherapy for schizophrenia and schizoaffective disorder.

iii. Aetiology: a contribution: A patient's schizophrenic or schizoaffective illness may commence with severe dysphoria and seriously confusing and debilitating unconscious guilt gradually developing from early experiences. The PPCC illustrates as cognitive neuroscience how the patient's dysphoric representational world psychologically affects the nucleus accumbens, leading to excess dopamine secretion.

iv. Pathogenesis: The pathogenesis of schizophrenia may then be understood: The sequence of developing pathology in schizophrenia and schizoaffective disorder arises from double unconscious guilt [17] and increasing, confused dysphoria experienced from exposure to an intrusive, confusing, individual or circumstance. This confusing unpleasantness is focused in a strong bind that manifests no relief, and adds to the dysphoria developing from the patient's generally miserable early experiences. The patient's dysphoria may cause the brain's reward and wellbeing centre, the nucleus accumbens, via decreased negative feedback along its glutamatergic connection, to stimulate the A10 nucleus'

dopaminergic mesocortical mesolimbic pathway. This leads to the nucleus accumbens and the prefrontal cortex secreting excess dopamine, which in turn causes the prefrontal cortex sensitized by perinatal hypoxia to malfunction. Professor Karl Friston suggests a physiological hypothesis for the prefrontal cortex's malfunctioning. He considers [18] that communication in the prefrontal cortex between giant pyramidal cells in layer 5 of the cortex and pyramidal cells in layer 3 may be disrupted in schizophrenia, causing errors in predictions by the cells regarding their representations from one layer to the other and acting via NMDA receptors. These factors arguably combine in schizophrenia, leading to symptoms of the illness.

The process of therapy

Psychoanalytic psychotherapy for schizophrenia and schizoaffective disorder may, in some cases that complete the treatment, resolve the illness, while in others, who leave before reaching full mental health, much benefit may still be incurred by the patient from the understanding they reach before leaving treatment. Patients suffering from schizophrenia and schizoaffective disorder are very vulnerable while in treatment and need intensive care. Psychoanalytic psychotherapy applied to schizophrenic illness is a highly skilled treatment; in Britain, only psychotherapists trained in Psychiatry treat psychotic patients, so that they may recognize symptoms as being psychotic when they occur. In the United States a therapist untrained in Medicine may rely on a Psychiatry-trained colleague for advice in treating schizophrenic patients.

Dr. Michael Robbins derived 7 Stages of healing from observation of his schizophrenic patients. These Stages observed by him in his clinical work [19,20] were found to be closely supported by interpretations derived from the PPCC model. The Stages were consistently observed by him in the progress his patients made towards healing of their schizophrenic illness while in therapy, however far they progressed with it. The PPCC model entirely supported his findings (see Table 1). The Stages he observed therapeutically in his patients were mirrored by the PPCC model from the patients' perspective, and the closeness with which the two were matched at each Stage may clearly be seen; they coincided with the Stages, and complemented each other from their perspectives [1].

Stages of Psychological Therapy of Schizophrenia: Dr Michael Robbins	PPCC Model of patient's mind: Dr Gillian Steggles	Stages in the patient's experience:
1.Protopathosymbiosis (parasitism): patient's identity is invested in her psychotic state.	Patient is unable to function healthily using her impoverished representational world.	Patient feels alienated in her environmental world, suffering from painful schizophrenic confusion.
2.Engagement: patient's sense of individuality is threatened.	Patient unconsciously assays including analyst in her representational world.	Patient attempts to engage with analyst: she may be well-defended.
3.Pathosymbiosis: may lead to collusion and Stage 3b: Therapeutic Stalemate.	Patient's 'blocked' schizophrenic mindset may prevent insightful interaction with analyst.	Tendency towards comfortable (but false) assumptions with analyst: reality cannot be contemplated.
4.Disengagement from pathological symbiotic collusion.	Patient succeeds in rejecting her previous maladaptive relationships and unhealthy engagements in her representational world	Patient works at reviewing her relationships and contemplating reality.
5.More Normal Symbiosis: growth-promoting.	Patient is awakened to the reality of her life in all its (painful) aspects of Time, Place and Person in context.	Patient is able to address reality with her analyst; she suffers intolerable experience of herself; she begins to understand her conflicts; she absorbs good feelings from the analyst; she begins to experience her own self-identity positively.
6. Psychic Differentiation and Integration.	Patient evolves into a discrete, integrated individual.	Patient can contain her own emerging integrated mental life successfully as a discrete individual, relating well to the analyst and individuating from him. Patient evolves into her own independent autonomy.
7. Therapeutic Termination.	Patient's mind is self-sufficient.	Patient leaves therapy with her difficulties resolved.

Table 1: Stages in the psychological resolution of schizophrenia.

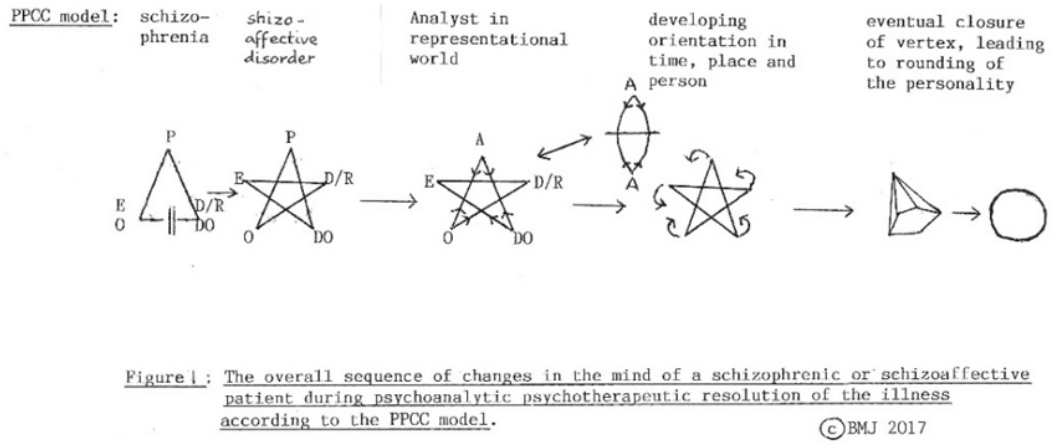
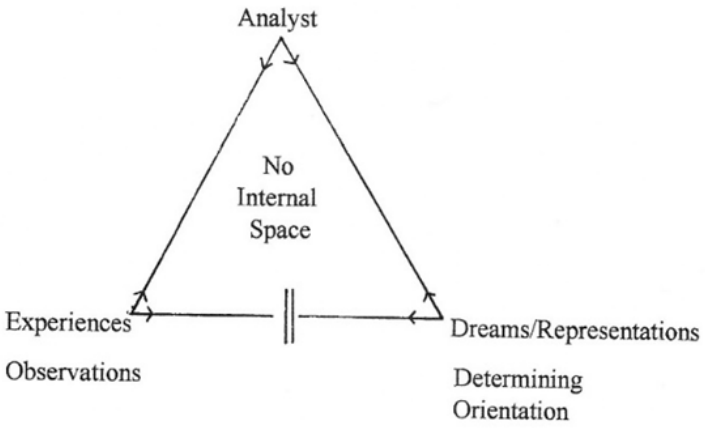
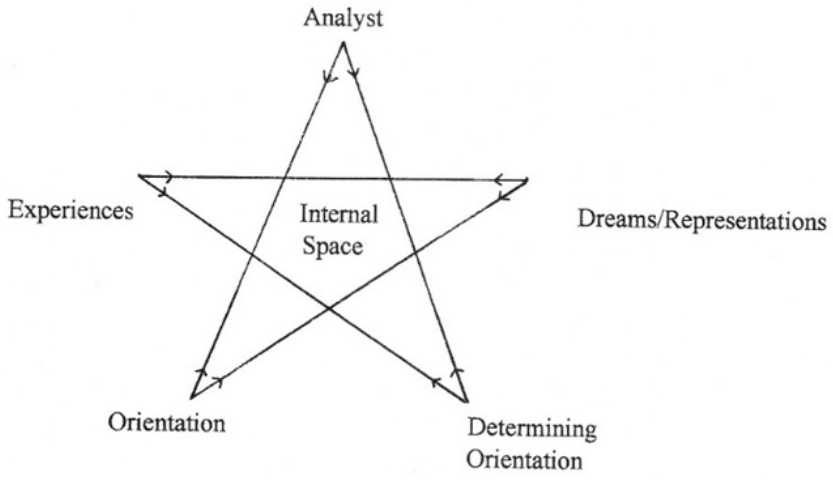


Figure 1: The overall sequence of changes in the mind of a schizophrenic or schizoaffective patient during psychoanalytic psychotherapeutic resolution of the illness according to the PPCC model.

Figure 1: The overall sequence of changes in the mind of a schizophrenic or schizoaffective patient during psychoanalytic psychotherapeutic resolution of the illness according to the PPCC model.



The PPCC model for schizophrenia

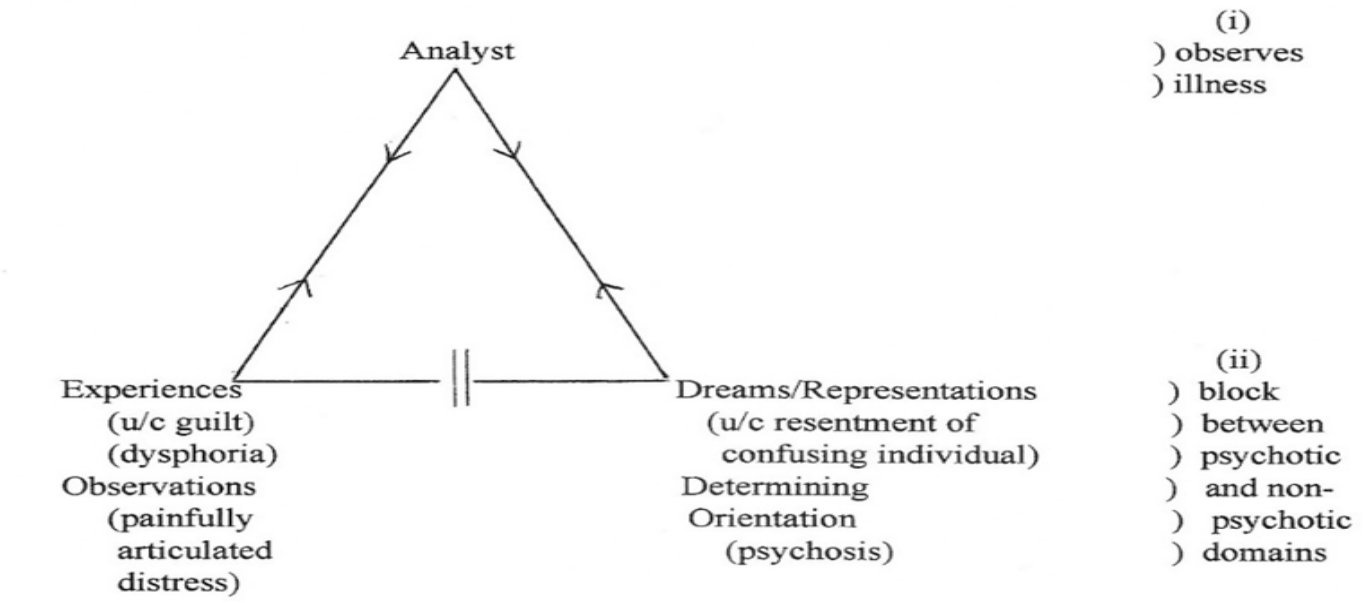


The PPCC model for schizoaffective disorder

Figure 2: The PPCC models for schizophrenia and schizoaffective disorder.

Schizophrenia

a) The PPCC's cognitive illustration of symptoms in the therapeutic dyad:



b) The PPCC's cognitive illustration of improving health in the therapeutic dyad:

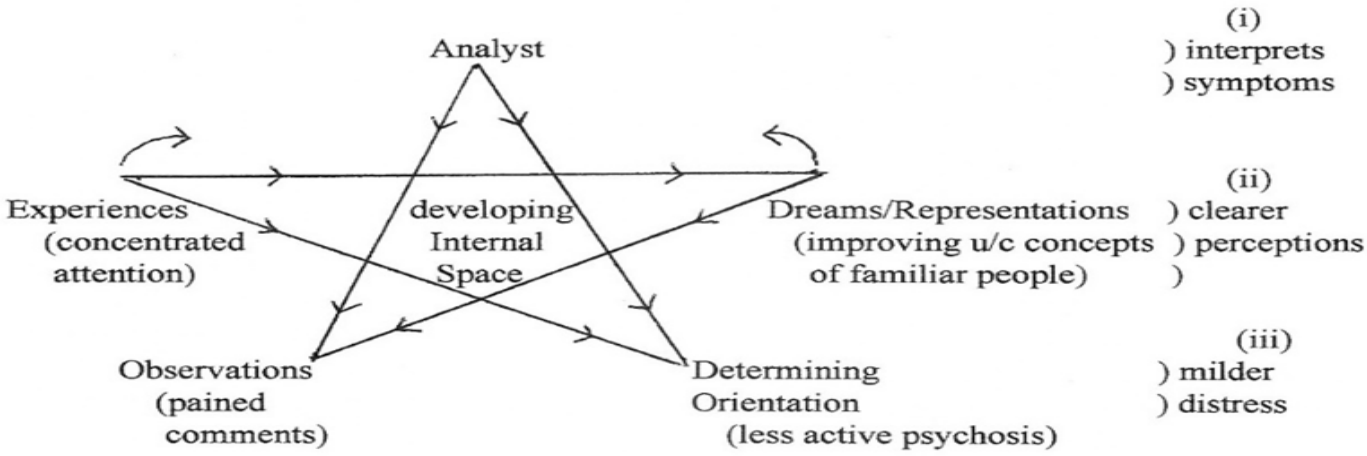
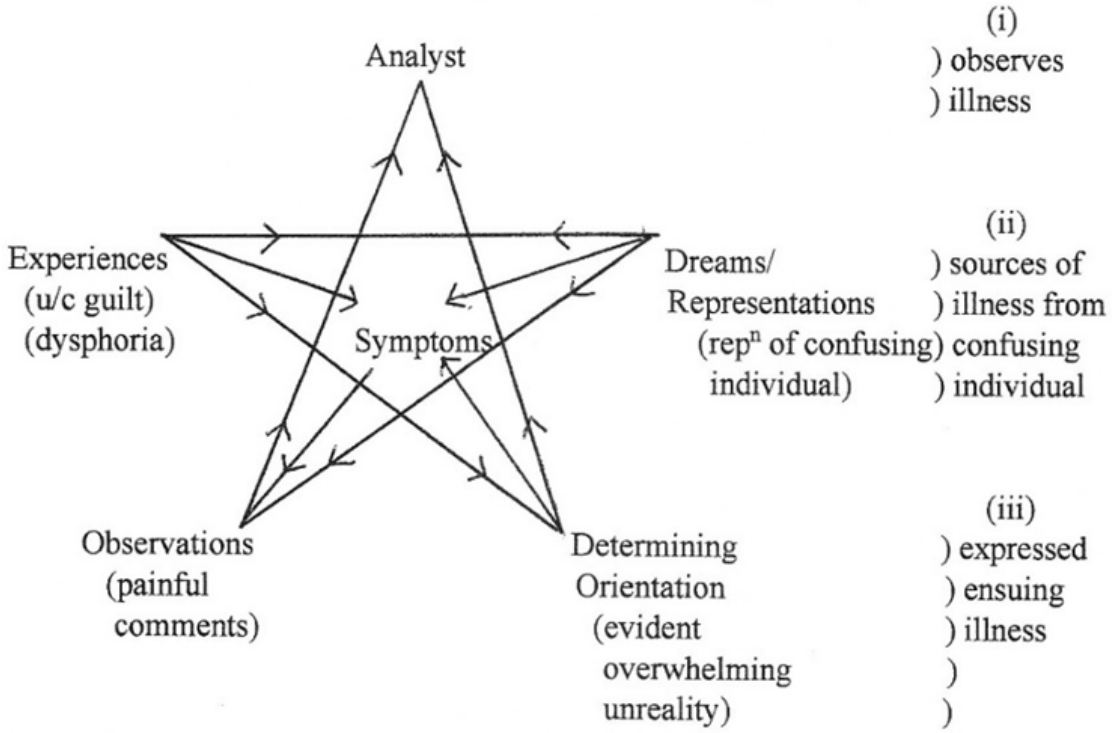


Figure 3: The PPCC models of symptoms and improving health in the psychoanalytic psychotherapy of schizophrenia.

Schizoaffective Disorder

a) The PPCC's cognitive illustration of symptoms in the therapeutic dyad:



b) The PPCC's cognitive illustration of improving health in the therapeutic dyad:

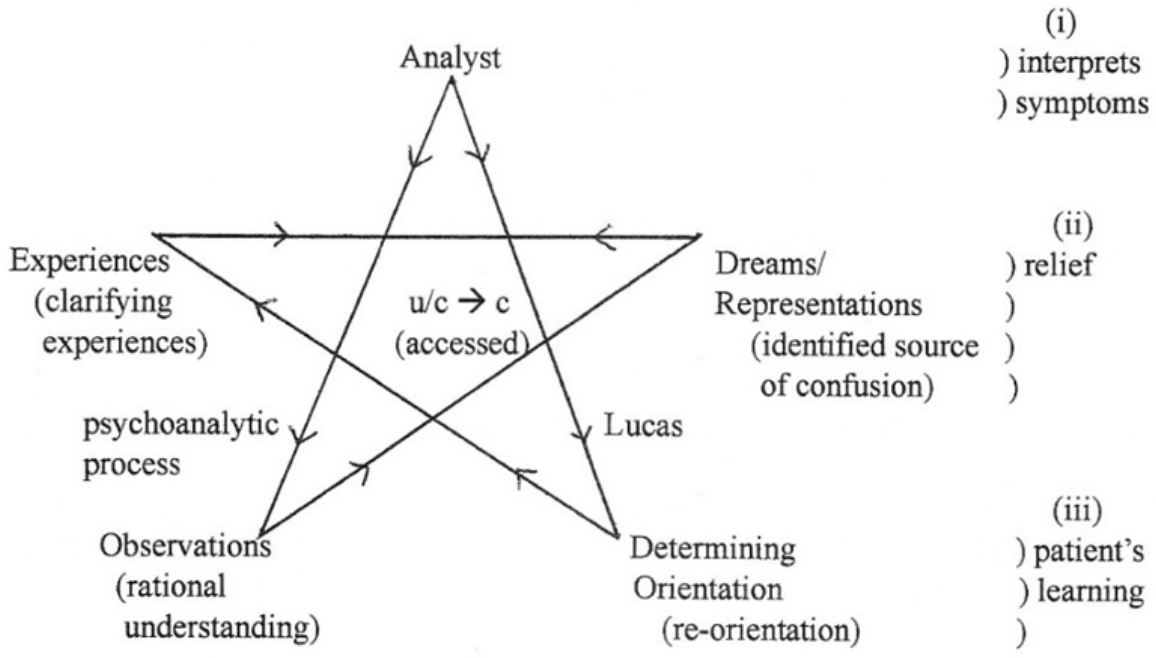
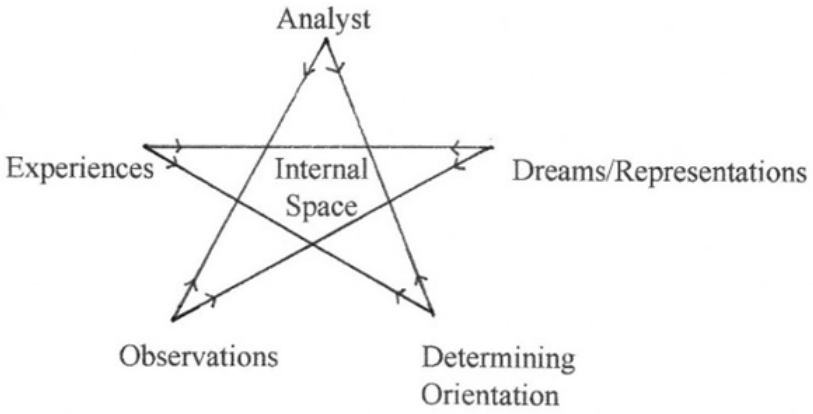


Figure 4: The PPCC models of symptoms and improving health in the psychoanalytic psychotherapy of schizoaffective disorder.



Representational World:

Analyst
none

Experiences
loneliness
misery
despair
hopelessness
fear
molestation aged 8 years (still unconscious)
first breakdown aged 20 years

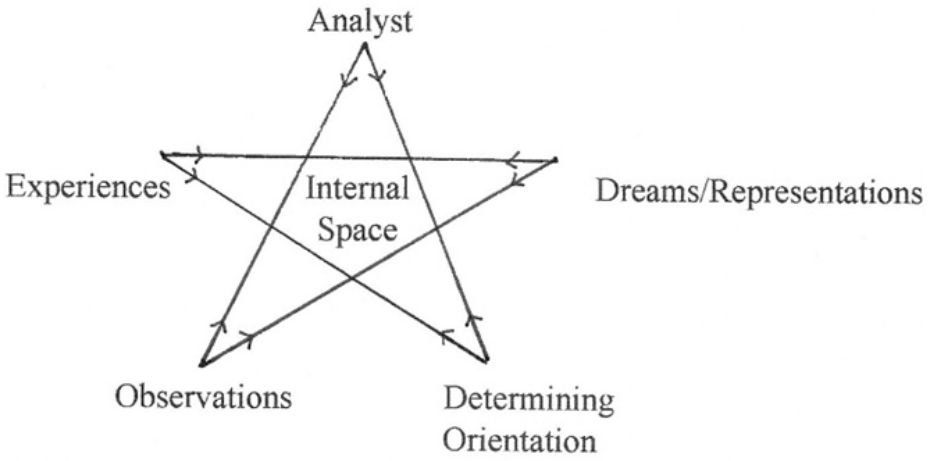
Dreams/Representations
black psychopath: sleep paralysis

Observations (she had observed from father)
Plaits not beauty, aged 14 years
"My, my!" upon learning of school scholarship
"gesture" upon making cake
"horrid [Claire]" in hall
guilt – had disclosed embarrassment in bath to Nannie
"pathetic creature" as a teacher
"NHS on its knees" as a House Physician

Determining Orientation
schizophrenia
depression

Internal Space
misery

Figure 5: Woman aged 20 years' schizoaffective representational world.



Representational World:

Analyst
intelligently and kindly clarifies the patient's mind.

Experiences
happy with husband
beautiful home
music
poetry
Medical studies
friends

Dreams/Representations
wishing she was well: and now is
psychoanalysed dream: of her father as a granite tenement building surrounded by deep rivers and cowpats: her mother as a woman in its brightly lit basement kitchen, surrounded by children.

Observations
pleased that her sister said to her: "You are the only one who understands"
"I was glad you were there"
so happy to be alive
delighted to be living with joy and integrity outside her family of birth

Determining Orientation
neutral

Internal Space
contained her abreaction emotion: "I'm innocent! I'm innocent! I'm innocent!"

Figure 6: Woman aged 71 years' schizoaffective representational world.

The PPCC model follows the same course experienced by patients as observed therapeutically, and illustrates the process through geometric concepts (see Figures 1,2,3 and 4). Here changes in the patient's mind are illustrated by geometric properties. The early inclusion of the Analyst in the patient's mind, replacing the earlier Problems variable as part of her representational world, is echoed in the model. The development of an Internal Space, or part of the mind available for reflection, is found in less ill schizoaffective patients but not in the more seriously ill schizophrenic patients who are hardly able to reflect. With the PPCC model becoming 3-dimensional, the containment of past experiences, images and thoughts becomes possible for the patient to embrace as therapy continues. The patient can now register the passage of time and their past experiences without becoming psychotic, together with inclusion of the attainment of orientation in time, place and person. Eventually, the model becomes spherical when the remaining "corners" of the patient's mind, eg. excessive shyness, anxiety, or irritability become "rubbed off" through social contact and interactions with others, leaving the model as a smoothly functioning sphere.

The PPCC construct's potential uses

The PPCC model was developed from patient-produced data during a schizoaffective patient's psychoanalytic psychotherapy. It is rooted in authentic evidence of psychoanalytic data derived from schizoaffective illness.

Its variables are confirmed as comprising data acknowledged [3] as those obtained in psychoanalytic treatments and from which psychoanalytic theories are mainly derived.

It would therefore seem that these variables are arguably comprehensive in including most aspects of a patient's mind: in its illness and in its health. The dysphoria aged 20 years and subsequent improving health of the schizoaffective woman when aged 71 years, whose data led to the PPCC model, are illustrated (see Figures 5 and 6).

The usefulness of the PPCC model is based on its potential for discoveries in cognitive neuroscience. The PPCC (psychodynamic pentapointed cognitive construct) model and its applications allow cognitive understanding of schizophrenia through psychoanalytic application of cognitive psychology. When the PPCC model was developed, it was found to consist, scientifically, of the psychoanalytic concept of the representational world [2]. The PPCC was founded on psychoanalytic observation, the externalized representational world of a young, 28 year old schizoaffective woman; further, similar observations might be made on other individual patients to produce and clarify improved formulations with a view to treatments specific for their needs.

This representational world, when studied in other patients, ie. those treated by Dr. Michael Robbins, [10,19], was found to be intensely dysphoric. The nucleus accumbens in the midbrain has been already recognized as rewarding artificial stimulation, by amphetamines and other psychostimulant drugs, with raised mood and even euphoria. It became known as the brain's reward centre. This mood raising was a direct effect of dopamine, produced by the nucleus accumbens when stimulated by the A10 nucleus via the mesocortical mesolimbic dopaminergic pathway. The nucleus accumbens' function of mood raising leads to its identification as the mind's wellbeing centre. Dopamine raised the mood of the patient. A major calming effect had been noted in monkeys, during physiological research, upon administration of the drug chlorpromazine. The observation that chlorpromazine became confirmed as acting as a powerful psychological tranquillizer in the related species, man, was used to develop and prescribe chlorpromazine for its major tranquillizing effect when this was intensely required, ie. in the tranquillizing of total mental disturbance, as in schizophrenia. It was found that the mode of action of chlorpromazine was through controlling the secretion of dopamine by the nucleus accumbens. The major tranquillizer group of drugs, and their modern derivatives, still act on schizophrenic illness primarily by suppressing dopamine production.

Dopamine induces feelings of having a reward, and of wellbeing. It may be considered as countering dysphoria. The representational world, having been recognized as describing an individual's experience of their successive environments, initially in a child, [2] was observed to have been particularly miserable in the histories of individuals who became schizophrenic patients. Dopamine was then understood to be responsible for the illness because drugs used to suppress dopamine production were found to be an excellent antidote to the patient's symptoms; the symptoms required clinical suppression, and this was achieved by the new major tranquillisers following chlorpromazine which had been found to be too sedative.

It was through study of schizophrenic and schizoaffective patients using the PPCC's analysis of their minds during psychoanalytic psychotherapy that their representational worlds were, without evident exception, observed to be thoroughly miserable; certainly, their recounted experience and behaviour prior to treatment indicated deep misery. Their illness was controlled by administration of chlorpromazine and later antispsychotic medications. So cognitive understanding of schizophrenia demonstrated how its early manifestation was led by dysphoria that could be treated with antipsychotic medication. The application of cognitive neuroscience, as the PPCC model for an example, is seen to have revealed the mechanism of schizophrenic illness.

Any patient's details could be applied to the model for deeper understandings or treatment possibilities to emerge. Research findings from techniques using its structure would be based on the essence of the human mind. Fresh attitudes to schizophrenic and schizoaffective illnesses would allow focus on accurate techniques for treatments, including specifically for the individual patient. Suffering could therefore potentially be alleviated in ways not previously available through treatments for these illnesses.

The PPCC model may have infinite applications in studying mentally ill patients. An infinite range of circumstances and

symptoms contributing to mental illness could be entered into the PPCC framework as content of the variables, and analysed. Computer technologies could be developed that might, especially with AI, produce interesting and valuable information about specific mental illnesses or specific problems in diagnosis: great care is required in utilizing AI. These developments could be used in wide-ranging studies to very good effect. They could also be of great help to clinicians in enabling them to discover patterns in their patients that fit one diagnosis or other, differential, diagnoses. The PPCC model could be applied epidemiologically or on an individual basis, helping individual patients with individually tailored therapy. These two aspects of Psychiatry are already being organized on a large scale, with very comprehensive study of psychotic illnesses being undertaken. The PPCC model might have a place as cognitive neuroscience in helping to structure studies and analyse findings.

The PPCC model may be useful to Psychoanalysts, Psychiatrists and Clinical Psychologists, who could utilize its dissection of the mind into mental features' clearly distinct origins. Classifying aspects of a patient's history would lead to fresh associations between factors that might then lead on to therapeutically useful conclusions. Richard Lucas' work on the Psychotic Wavelength [21] might be applied through the PPCC to a specific patient's symptoms. Connections made by computer software or carefully observed AI would result in fresh appraisal of a mentally ill patient. The treatments being planned for individual patients and those studied in current epidemiological research would then be within reach for the Psychiatry profession.

Early intervention teams using a psychodynamic approach might find that structuring a new patient's details on to the PPCC model leads them to observations useful at the onset of a patient's illness. In this way, lowering the duration of untreated psychosis might be facilitated. The PPCC being adaptable to any patient's psychological situation would, through its versatility, be a constant resource to be used for any new admission. It could clarify the overall wholeness of a patient's mind, to make visible its summary psychological picture: an early formulation of patients suffering from schizophrenia. Its summaries would permit focus on aspects of the patient for early assessment and management.

Treatment

The PPCC might assist treatment's efficacy pharmacologically as well as psychologically. Computer software could be set up to draw parallels between specific symptoms and specific drugs, derived from entering patient details into the PPCC variables. If a number of patients' details were entered into the PPCC's 4 patient variables, commonalities among these might be more easily observable. If specific features were identified epidemiologically these could be aligned with specific medications and clear research evidence provided to support clinical observations.

The PPCC, relating its patient variables to each other and to the Analyst during treatment, could feature as a dynamic, observable process moving through time by re-entering patient data sequentially. Changes from one psychological situation to a subsequent one, ie. a patient's representational world at one time and then followed up by subsequent factual data in a new environment could, if repeated, illustrate quite clearly a patient's progress through therapy, and help to identify the effectiveness of medication.

Applications of the PPCC to the four main levels of treatment of schizophrenia summarized by Dr. Michael Robbins [19] are proposed:

i. The specific symptoms of a patient, if clarified and entered into the PPCC, could thereby be accurately assessed and form a clear basis for selecting medication with equally specific pharmacological properties, leading to improved efficacy.
ii. Psychological information and conclusions could also be derived from entering patient data into the PPCC model. Detailed conclusions could be obtainable if enough information was entered into computer software. As with all conclusions drawn from computer output, care would need to be taken to assess the results obtained so that mistakes and computer error do not extend into the clinical sphere.
iii. Family dynamics might be represented by several PPCC structures interacting, eg. involving the same Analyst. This would be a step further, but might suggest adjunctive aspects to clinical conclusions about the family's problems.
iv. Social factors are unlikely to be amenable to representation through the PPCC model.

These therapeutic approaches assisted by the PPCC model would usually overlap and be used concurrently. Each would require careful administration, but if followed the patient's health would increasingly become apparent, and her personality gradually emerge.

Discussion

Professor Karl Friston's work showing neurophysiological changes in the pyramidal cells in layers 3 and 5 of the prefrontal cerebral cortex, involving NMDA receptors [18], suggests clearly that the prefrontal cortex responds adversely to dopamine in schizophrenia. As the centre in the brain that assesses, determines, and regulates the activities of the individual, when the prefrontal cortex malfunctions (having previously become damaged in some cases by perinatal hypoxia) the individual's activities become disturbed. No longer able to function normally, they manifest psychotic language and behaviour, diagnosed as a schizoid illness. Schizophrenia and schizoaffective disorder comprise distinguishable diagnoses, and variations in symptoms lead to differently diagnosed illnesses.

The symptoms of schizophrenia and schizoaffective patients are defined by these illnesses' psychological and neurophysiological aetiology. Their aetiology principally comprises genetic disposition; perinatal hypoxia; malfunctioning pyramidal cells in the prefrontal cortex affected by excess dopamine; a psychological bind involving severe dysphoria and double or complex unconscious guilt [17] commonly due to an environmental factor or

to a confusing individual in the environment; and lack of sufficient emotional support to overcome these debilitating experiences.

Eric Kandel wholly supports interaction between Psychoanalysis and biology in his two papers "A New Intellectual Framework for Psychiatry", of 1998, and "Biology and the Future of Psychoanalysis: A New Intellectual Framework for Psychiatry Revisited", of 1999 [22,23]. He is concerned that Psychoanalysis and biology combine their thinking to benefit Psychiatry. The PPCC model may through cognitive neuroscience address both psychoanalytically based features and Professor Friston's neurophysiological findings concerning schizophrenia and its treatment. Epidemiological Psychiatric studies utilizing the clarity of the PPCC model may be undertaken which promise to expose fundamentally underlying features of schizophrenia, schizoaffective disorder and psychotic depression, and render possible devising individual Psychiatric treatments accordingly.

The PPCC model and its implications are rooted in cognitive neuroscience. In Eric Kandel's paper of 1999, he describes his hopes for the future of Psychiatry in terms of Psychoanalysis and biology, and specifically in terms of advances in cognitive neuroscience:
"My purpose in this article is to suggest one way that Psychoanalysis might re-energise itself, and that is by developing a closer relationship with biology in general and with cognitive neuroscience in particular".

The PPCC, a cognitive construct, produces as neuropsychology a connection between Professor Sandler's and Bernard Rosenblatt's preconscious, psychoanalytically derived structure of the representational world and excess dopamine production due to the dysphoria observed in schizophrenic patients. The identified dysphoria causes the nucleus accumbens, the reward and wellbeing centre of the brain, to respond by leading, via the A10 nucleus, to excessive production of dopamine in schizophrenic patients. This may answer Dr Kandel's projection. He is concerned that:
"Psychoanalysis is floundering because of lack of scientific underpinning for its ideas".

But the psychoanalytic idea of the representational world is here shown to be underpinned by the scientific knowledge of the nucleus accumbens' dopamine secretion. The representational world is a psychoanalytic idea confirmed by the scientifically derived PPCC model which confirms it.

Advocating scientific biology he writes further:
"From an experimental point of view, biological insights could serve as a stimulus for research, for testing specific ideas about how the mind works",

The biological insight of the mechanism of increased dopamine secretion could serve as a stimulus for testing how, for example, dopamine causes the prefrontal cortex to malfunction, qv. Professor Karl Friston's work [18].

Specifically, he concludes:
"Cognitive neuroscience could provide a new foundation for the future of Psychoanalysis".

The cognitive neuroscience engaged by the PPCC model could provide a new foundation for a new scientific branch of Psychoanalysis which endorses Neuropsychoanalysis.

As he says:
"Meaningful scientific interaction between Psychoanalysis and cognitive neuroscience of the sort that I outline here will require new directions for Psychoanalysis and new institutional structures for carrying them out".

Perhaps the PPCC model as cognitive neuroscience might provide a new direction for both Psychoanalysis and Psychiatry developing from it; certainly, for example, usefully contributing to the understanding of schizophrenia. Psychiatry seeks understanding of schizophrenia and related illnesses, and epidemiological Psychiatric studies may be undertaken which promise to expose further fundamentally underlying features of schizophrenia, schizoaffective disorder and psychotic depression. Psychiatric treatments for individual patients may be devised accordingly. Knowledge required by Psychiatry from Psychoanalysis could be acquired through applied cognitive neuroscience if, in due course, psychoanalysts were prepared to reach conclusions collectively. Contributions from cognitive neuroscience can support psychoanalytic beliefs. This has been illustrated above, where the cognitive neuroscientific PPCC supports the psychoanalytic belief of the representational world. Until this position is reached, Psychoanalysis will continue to lose its way as Dr Kandel explicates, and Psychiatry would not be able to benefit from it and progress.

A further possible approach to preventing Psychoanalysis from "floundering" and losing its way might be for it to branch into a scientific branch, such as Neuropsychoanalysis and the cognitive neuroscience of the PPCC model, and an artistic branch, which might develop through creatively approaching history, art and sociology, which a large proportion of psychoanalytic writings have for many years already engaged in. These two complementary branches could explore two very widely different ways of thinking manifest in the human mind. Such a branching out could permit an almost indefinite amount of progress for Psychoanalysis, not only in preserving the huge amount of exploration in the humanities already widely achieved by Psychoanalysts, but in laying the way open also for the practice of Psychiatry to utilize all the exciting physiological applications of neuroscience served by Neuropsychoanalysis, such as recent advances involving neuralinks and neuropixels. Both these approaches could enable Psychanalytic thinking to burgeon and lift it out of any floundering.

Conclusions

The PPCC (psychodynamic pentapointed cognitive construct) model with psychoanalytically-based variables illustrates through examining schizophrenia how cognitive neuroscience may connect

psychoanalytic data with brain functioning. A patient's dysphoria, based on accumulated unconscious and psychoanalytically understood guilt and unpleasant, miserable experiences, psychologically affects the brain's reward and wellbeing centre, the nucleus accumbens, into responding with excessive dopamine secretion. A psychoanalytically and psychologically understandable experience initiates a physiological response. This effect is common in Medicine, for example the fearful psychological fight or flight or freeze experience that stimulates eccrine sweat glands of the palms of the hands or soles of the feet to secrete sweat.

Cognitive neuroscience is considered to hold potential [22,23] for enabling Psychiatry to benefit from both psychoanalysis and biological, or physiological knowledge. Kandel observes that "psychoanalysis still represents the most coherent and intellectually satisfying view of the mind" [23]. If Psychiatry were therefore to embark upon studying cognitive neuroscience while embracing a psychoanalytic view of the mind, it could make fresh discoveries, as illustrated by the PPCC's use in connecting a schizophrenic patient's experiences with the physiological explanations for their illness.

This form of knowledge, cognitive neuroscience, could be greatly expanded within Psychiatry, using Psychiatry research. Psychiatry might then prosper in its aims of further treating and resolving mental illnesses using improved understanding of psychological and physiological processes, and thereby of the illnesses themselves. Eric Kandel's hopes for the future of Psychiatry might now become fulfilled, through addressing both "the most coherent and intellectually satisfying" psychoanalytic view of the mind and also biologically-based physiological knowledge, eg. the neurophysiology of pyramidal cells in the prefrontal cortex [18]. It seems the future of Psychiatry looks very bright, with clinical staff energized in helping their patients with even the most severe illnesses survive into improved mental health and wellbeing. Psychoanalysis itself might also find its own way forward by branching into a scientific branch, as already engaged with through Neuropsychoanalysis and also the cognitive neuroscientific approach of the PPCC model, and a branch celebrating the artistic capacities of the human mind such as those parts that consider history, the arts, and sociology. Psychiatry's progress in understanding mental illness through increasing its grasp of both psychoanalytic and neurophysiological knowledge, through cognitive neuroscience, will encourage improved treatment practices. Lessened distress, even that caused by severe mental illnesses, becomes a realistic possibility that the Psychiatry and Psychoanalytic professions could achieve together.

Acknowledgements

To University College London and UCH for my medical education and use of their libraries; to Professor Martin Prince, Dr. Nick Glozier and Professor Rob Stewart and the Institute of Psychiatry, Psychology and Neuroscience for my education in research methods in Psychiatry; to the Royal Society of Medicine for use of their library; to the Institute of Psychoanalysis for seminars and the use of their library; to Professor Peter Fonagy and the Psychoanalysis Unit at UCL and to Professor Bob Hinshelwood and the Centre for Psychoanalytic Studies at Essex University, for my education in Psychoanalysis; and to Mr T J Steggles for personal support in many ways.

This manuscript is an honest, accurate and transparent account of the study being reported; no important aspects of the study have been omitted. There have been no discrepancies from the study as planned.

References

1. Steggles G. The process of recovery of a schizoaffectively disordered mind: a psychoanalytic theory of the functional psychoses, the psychodynamic pentapointed cognitive construct theory. BMJ Case Rep. 2012.
2. Sandler J, Rosenblatt B. The concept of the representational world. Psychoanal St Child. 1962; 17: 128-145.
3. Gelder M, Harrison P, Cowen P. Shorter Oxford textbook of Psychiatry, 5th Edition, Oxford: Oxford University Press. 2006; 89.
4. IoPPN. Institute of Psychiatry, Psychology and Neuroscience. Qualitative research methods. London: Joanna Murray. 2004.
5. Steggles G. Stages in the psychological resolution of schizophrenia. Front Psychol. 2015; 6: 86.
6. Steggles G. Psychoanalytic psychotherapy for schizophrenia and schizoaffective disorder. SMG Group: Schizophrenia Treatment. www.smgbooks.com. 2015.
7. Steggles G. Psychological progress in schizophrenic patients undergoing psychoanalytic psychotherapy. Int J Psychol Psychoanal. 2016; 2: 012.
8. Steggles G. Visually conceptualizing psychoanalytic resolution of schizophrenia and schizoaffective disorder. Int J Psychiatr Res. 2018; 1: 1-4.
9. Steggles G. Evidence for the effective resolution of schizophrenia and schizoaffective disorder using psychoanalytic psychotherapy, derived through visualization of the process. Int J Psychiatr Res. 2019; 2: 1-5.
10. Steggles G. The Psychiatry of resolving schizophrenia psychoanalytically: How visualizing the therapeutic process can assist success. Free Association Books. 2019.
11. Steggles G. The pathogenesis of schizophrenia and outlines for its suggested treatment accordingly. Int J Psychiatr Res. 2022; 5: 1-6.
12. Steggles G. The pathogenesis and remedial treatment (and management) of schizophrenia. Int J Psychiatr Res. 2024; 7: 1-4.
13. Steggles G. Schizophrenia – A contemporary introduction. London and New York: Routledge, Taylor & Francis Group. 2024.
14. Steggles G. Negative symptoms and social functioning in schizophrenic patients addressed alongside medication by psychosocial interventions. Open Journal of Psychiatry. 2025; 15: 386-394.

15. Steggles G. Progress toward health in schizophrenic patients undergoing psychoanalytic psychotherapy: Revisiting Dr Robbins' technique. Medical Science: Recent Advances and Applications. 2025; 4.
16. Steggles G. Accessible schizophrenic and schizoaffective patients successfully treated with psychoanalytic psychotherapy. Int J Psychiatr Res. 2026; 9: 1-10.
17. Steggles G. Double (i) non-consciously registered and (ii) unconscious guilt as an aetiological psychological bind with contributory aetiological scientific paradigms in the wholly effective psychotherapeutic psychoanalysis of a schizoaffective woman. Int J Psychiatr Res. 2026; 9: 1-15.
18. Friston K, Brown H, Siemerkus J, et al. The dysconnection hypothesis (2016). Schizophr Res. 2016; 176: 83-94.
19. Robbins M. Experiences of schizophrenia: An integration of the personal, scientific and therapeutic. New York: The Guilford Press. 1993.
20. Robbins M. The successful psychoanalytic therapy of a schizophrenic woman. Psychodyn Psychiatr. 2012; 40: 575-608.
21. Lucas R. The Psychotic Wavelength. London and New York: Routledge. 2009.
22. Kandel E. A new intellectual framework for Psychiatry. Am J Psychiatry. 1998; 155: 457-469.
23. Kandel E. Biology and the future of psychoanalysis: A new intellectual framework for Psychiatry revisited. Am J Psychiatry. 1999; 156: 505-524.