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# Defining Psychosis: The Evolution of DSM-5 Schizophrenia Spectrum Disorders

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**Abstract** Descriptions of mental illness exist throughout recorded history. However, until the mid-twentieth century, there was no standard nosology or diagnostic standard for mental disorders. This limited understanding of these disorders and development of better treatments. As conditions such as dementia praecox and schizophrenia were being described, collaborative efforts were made in the twentieth century to develop the first Diagnostic and Statistical Manual of Mental Disorders (DSM). This review provides an overview of the history of psychiatric diagnosis with a focus on the history of schizophrenia as a diagnosis in the DSM. DSM-5 updates to diagnostic criteria for schizophrenia and related disorders are provided. Limitations to diagnostic validity and reliability are discussed in addition to changes in diagnostic approaches to schizophrenia spectrum and other psychotic disorders in an effort to improve diagnostic validity and reliability. The DSM-5 reflects the culmination of an ongoing collaborative effort to improve the diagnosis of mental disorders, and future research in Research Domain Criteria (RDoC) will help provide convergent validity when understanding and treating mental illnesses.

**Keywords** Schizophrenia · Schizophrenia spectrum disorders · Psychotic disorders · Psychiatric diagnosis · Psychiatric nosology · ICD · DSM · DSM-5 · RDoC · Psychiatry

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## Introduction

Descriptions of mental illness exist throughout recorded history and across cultures and civilizations. Written records of mental illnesses such as depression and dementia are found in ancient texts including the ancient Egyptian *Eber Papyrus* (c. 1550 BC) [1] and Hindu scriptures such as the *Mahabharata* (c. 400 BC) [2]. Psychiatric disorders, including schizophrenia, are widely recognized throughout recorded history and long recognized as a significant public health concern. However, through most of history the lack of both systematic, evidence-based diagnoses and nosology for mental disorders posed significant limitations for understanding and developing better treatments for mental illnesses. Physicians such as Emil Kraepelin began characterizing mental illnesses such as schizophrenia in the early twentieth century, and the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) published in 1952 represented the first coordinated effort to create a diagnostic manual solely dedicated for use in psychiatric disorders and integrated with the *International Classification of Diseases* (ICD) published by the World Health Organization (WHO). The DSM has since undergone five major revisions over its 60 year history, and the DSM-5 published in 2013 now serves as the main clinical and research reference for diagnosing mental illnesses. This article provides a review of the history of psychiatric diagnosis and development of the DSM [3] with a focus on the evolution of diagnostic criteria for schizophrenia spectrum and other psychotic disorders as published in the DSM-5 [4••]. Limitations to using the DSM-5 will be discussed in addition to future research to improve the understanding and nosology of mental illnesses.

## History of Psychiatric Diagnosis

Prior to the twentieth century there was no standard definition or classification of mental disorders. This posed a challenge to clinicians who had difficulty accurately diagnosing and

treating mental illnesses and researchers who recognized the significance of mental illnesses, specifically schizophrenia, on public health but could not accurately characterize and study such conditions. For the majority or history, psychiatric illnesses were poorly characterized, treatments were insufficient, and prognosis poor.

The first attempt to systematically study mental illness was in the 1840 U.S. Census when an effort was made to collect information on the frequency of "idiocy" and "insanity." These efforts were intended to account for the number of individuals in the U.S. who lived in mental institutions and provided invaluable data for epidemiologists. By the 1880 census, seven categories of mental health were identified including 1) mania, 2) melancholia, 3) monomania, 4) paresis, 5) dementia, 6) dipsomania, and 7) epilepsy. In 1917 the American Medico-Psychological Association (now known as the American Psychiatric Association), together with the National Commission on Mental Hygiene, formulated a plan adopted by the U.S. Bureau of the Census for gathering uniform statistics across mental hospitals. Together both groups developed the first psychiatric diagnostic manual including 22 diagnoses and titled the *Statistical Manual for the Use of Institutions for the Insane.* Post-World War II, a much broader psychiatric nomenclature and classification scheme was developed by the U.S. Army and led by psychiatrist, Brigadier General William C. Menniger. This nomenclature was called the Medical 203 and adopted and later modified by the Veterans Administration (VA) to better incorporate outpatient psychiatric presentations of World War II servicemen and veterans with illnesses including psychophysiological, personality, and acute disorders. The World Health Organization (WHO) published the 6th edition of the International Classification of Diseases (ICD-6) in 1949, and it included for the first time a section on mental disorders. The ICD-6 was heavily influenced by the Medical 203 and included ten categories for psychoses and psychoneuroses in addition to seven categories for disorders of character, behavior, and intelligence.

The American Psychiatric Association (APA) formed a Committee on Nomenclature and Statistics who developed a variant of the ICD-6 published in 1952 as the first DSM [5]. The DSM-I was largely derived from the section on mental disorders in the Standard Classified Nomenclature of Disease developed at the National Conference on Nomenclature of Disease in 1933 and included 106 mental disorders. The DSM-I contained a glossary of descriptions of mental illnesses arranged in diagnostic categories and emerged as the first official clinical manual of mental disorders. It attempted to use epidemiological data to provide clinicians a more accurate framework for understanding the types of mental illness seen in clinical populations. The DSM provided epidemiologists the ability to better characterize and study mental illnesses such as schizophrenia, and the DSM became the diagnostic standard for clinicians and researchers. The central and ongoing goal of the DSM is to aid diagnosis and assessment of psychiatric disorders, and it does not make recommendations regarding treatments.

There was little difference in the DSM-I compared to the DSM-II published in 1968 [6]. Both versions largely reflected a psychodynamic approach to psychiatric diagnosis. The DSM-II included 182 disorders and attempted to achieve greater uniformity of diagnostic classification at an international level with nomenclature based on the ICD-8. The validity of psychiatric diagnoses has been based on expert clinical consensus since the 1970s drawn from a wide-range of clinical experience and available basic, clinical, and epidemiological research [7]. Robert Spitzer was chair of the task force leading to the publication of the DSM-III in 1980. The initial aim of the DSM-III was to better align DSM nomenclature with the ICD, but Spitzer and colleagues lead a broader effort to improve the uniformity and validity of psychiatric diagnoses. Criteria adopted for many DSM-III disorders were taken from Feighner [8] and Research Diagnostic Criteria (RDC) [9], both used in psychiatric research to provide more reliable diagnosis of mental disorders. Significant changes in the DSM-III included 265 diagnostic categories with introduction of explicit diagnostic criteria, a multi-axial system, and a descriptive approach that attempted to be neutral with respect to theories of etiology (e.g., neurobiological, cognitive, psychodynamic, etc.). These changes were the result of extensive empirical work on the construction and validation of explicit diagnostic criteria and the development of semi-structured interviews. Field trials sponsored by the NIMH were first performed for the DSM-III in an effort to establish clinical reliability of DSM-defined psychiatric diagnoses [10]. Areas of inconsistency and further clarification of diagnostic criteria led to a revision in 1987, the DSM-III-R, with 292 diagnoses. The DSM-IV, published in 1994, was the culmination of a 6-year effort involving constructing a comprehensive review of the literature to establish an empirical basis for modifications. It contained 297 disorders, and numerous changes were made in the DSM-IV including the addition, reorganization, and elimination of psychiatric disorders in addition to updated diagnostic criteria and descriptive text. A largely unchanged text revision, the DSM-IV-TR, was published in 2000.

The development of the recently published DSM-5 (2013) was the culmination of more than a decade of work by thousands of clinicians and patients. Development of the DSM-5 began in 1999 among leaders of the NIMH and the APA who worked together to expand the scientific basis for psychiatric diagnosis and classification. Under the guidance of a steering committee comprised of representatives from APA, the NIH, and the WHO; 13 conferences were held from 2004 to 2008 formulating the development of the DSM-5. Experts represented at these conferences spanned the globe with

approximately half of the 397 participants from outside the U.S. In each conference, participants wrote papers addressing specific diagnostic questions, based on a review of the literature, and from these papers and the conference proceedings, a research agenda was developed for the DSM-5. The results of these conferences have been published to date in peer-reviewed journals or American Psychiatric Publishing, Inc. (APPI) monographs. Findings from all 13 conferences served as the research base for the DSM-5 Task Force and Work Groups and for the WHO as it develops revisions of the International Classification of Diseases. In 2006, a DSM-5 Task Force was created to oversee 13 diagnostic work groups comprised of experts who reviewed the research and literature to form the content and diagnostic criteria in the DSM-5. A series of monographs were published outlining goals of the DSM-5 and included 1) improving the diagnostic specificity to reduce Not Otherwise Specified (NOS) diagnoses, 2) add a dimensional component to diagnostic evaluations, 3) better align the DSM-5 with the ICD-11, and 4) ensure the definitions and diagnostic criteria reflect the strongest scientific evidence. The face and construct validity of revised DSM-5 diagnoses were performed by work groups who made proposed diagnostic changes based on available evidence and secondary data analyses from field trials [11•]. For the first time in the history of the DSM, proposed diagnostic criteria were released to the public and thousands of comments were reviewed during revisions. The DSM-5 contains 295 diagnoses and is organized into three major components for each disorder including 1) the diagnostic classification, 2) the diagnostic criteria sets, and 3) the descriptive text. Authors of the DSM-5 sought to move away from categorical diagnoses and develop a dimensional approach to diagnosing and assessing mental illnesses in an effort to reduce NOS diagnoses. Examples of diagnoses reflecting a more dimensional approach include the newly termed autistic and schizophrenia spectrum disorders (Fig. 1). Diagnoses in the DSM-5 remain categorical, but many are defined by degree of illness severity and the multiaxial assessment is eliminated. Six diagnoses were added, and eight were removed. Despite significant criticism and clear limitations, the DSM-5 represents the most up to date diagnostic manual for psychiatric disorders.

## Defining Psychosis and Schizophrenia

Preceding development of the DSM, in the late nineteenth and early twentieth centuries Emil Kraepelin differentiated types of psychosis by identifying two patterns he described as *manic depressive psychosis* and *dementia praecox* (dementia of the young) in his manuscripts *Lehrbuch der Psychiatrie* (1893) and *Demenita Praecox and Pathophysiology* (1919) [12]. He described dementia praecox as a disorder of positive and negative symptoms and described it as a disorder of, "intellect, emotion, and volition… [with] annihilation of 'intrapsychic co-ordination.'" Eugen Bleuler [13] first used the term and diagnosis "schizophrenia" in a 1908 lecture given in Berlin and later described "schizophrenia" in *Dementa Praecox, oder Gruppe der Schizophrenien* (1911) [13] as the result of a "splitting [and dissociation] of the mind," particularly between emotional and intellectual functions of the brain. He identified schizophrenia as a disorder of thought, emotion, and behavior in addition to recognizing the chronic course of the illness punctuated by episodes of symptom exacerbation.

In the early twentieth century Kurt Schneider listed symptoms he believed were unique to schizophrenia but now generally considered more specific to psychosis and seen across a range of disorders [14]. Schneider's descriptions of psychosis have contributed significantly to the current diagnosis of schizophrenia and are often referred to as Schneider's first-rank symptoms. These symptoms include delusions and hallucinations of a specific nature and quality whose diagnostic specificity in relation to schizophrenia has been questioned and less emphasized in more recent criteria used to diagnose the illness [15].

The introduction of the DSM-I in 1952 provided epidemiologists the ability to more accurately study a well-recognized population of patients who met criteria for a diagnosis of schizophrenia. The DSM-I described a condition called "Schizophrenic reactions" under "Disorders of Psychogenic Origin." There were nine subtypes including simple, hebephrenic, catatonic, paranoid, acute undifferentiated, chronic undifferentiated, schizo-affective, childhood, and residual. "Schizophrenic reactions" changed to "schizophrenia" in the DSM-II. Schizophrenia was better characterized as distinct from affective psychoses, and changes were made to subtypes. Significant changes to psychiatric diagnoses occurred with the DSM-III in 1980, and among the many changes to diagnoses in the DMS-III, "schizophrenia" was changed to " schizophrenic disorder," schizoaffective disorder was first recognized as a unique illness (but no diagnostic criteria was provided), and the hebephrenic subtype of schizophrenia was renamed disorganized. The DSM-III used specific criteria for a diagnosis of "schizophrenic disorder" with the Criteria A symptom onset limited to before age 45. This age criteria

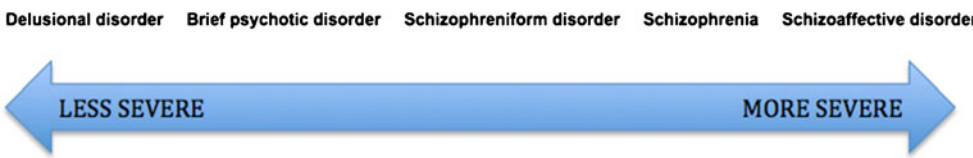


**Fig. 1** Schizophrenia spectrum disorders illustrated along a continuum of severity

was eliminated in 1987 with the DSM-III-R, and "schizophrenic disorder" was renamed "schizophrenia." Few changes were made to the diagnosis of schizophrenia with the DSM-IV. Duration of Criteria A psychotic symptoms in the DSM-IV was extended to a minimum one month compared one week in the DSM-III-R. Negative symptoms were added to Criteria A symptoms in the DSM-IV. The DSM-III through the current DSM-5 generally describes a diagnosis of schizophrenia as a syndrome including 1) at least two psychotic symptoms for 2) a specified duration of time with 3) decline in function 4) and exclusion of other causes.

## DSM-5 Schizophrenia Spectrum and Other Psychotic Disorders

The DSM-5 work group on psychotic disorders comprised of 12 experts in the field of schizophrenia and related psychotic disorders. The psychotic disorders work group reviewed the literature and available evidence guiding revisions to the diagnosis of schizophrenia and other psychotic disorders. The DSM-5 attempts to move from a categorical to spectrum approach when clinically diagnosing mental illnesses, including schizophrenia [16, 17], and the work group proposed several updates to classification of psychotic disorders in a DSM-5 chapter titled Schizophrenia Spectrum and Other Psychotic Disorders.

This chapter includes the diagnoses delusional disorder, brief psychotic disorder, schizophreniform disorder, schizophrenia, schizoaffective disorder, substance/medication-induced psychotic disorder, psychotic disorder due to another medical condition, catatonia, other specified schizophrenia spectrum and other psychotic disorder, and unspecified schizophrenia spectrum and psychotic disorder (Table 1). The DSM-5 acknowledges the numerous findings in schizophrenia spectrum disorders (e.g., genetics, reduced brain volume, etc.) but concludes as of the time of publication of the DSM-5 in 2013, schizophrenia spectrum disorders have no confirmatory or diagnostic radiological, laboratory, or psychometric tests. Furthermore, the DSM-5 eliminated subtypes of schizophrenia removing paranoid, disorganized, catatonic, undifferentiated, and residual subtypes. The validity of schizophrenia subtypes has been questioned with efforts to diagnose schizophrenia and related psychoses along a spectrum of symptoms and severity rather than by subtype [18, 19•].

Other changes to diagnostic classification of psychotic disorders in the DSM-5 include the elimination of shared psychotic disorder (folie à deux) and psychotic disorder not otherwise specified. Schizotypal personality disorder is classified as a personality disorder in the DSM-5 but recognized as a schizophrenia spectrum disorder in line with the ICD-10 diagnosis of schizotypal disorder [20]. Regarding the diagnosis of schizophrenia, the ICD-10 puts more emphasis on Schneiderian symptoms; whereas, the DSM-5 makes an attempt to diagnose schizophrenia and related psychotic disorders along a spectrum (Fig. 1).

The DSM-5 chapter on Schizophrenia Spectrum and Other Psychotic Disorders begins with a description of the key features defining a psychotic disorder including delusions, hallucinations, disorganized thinking (speech), grossly disorganized or abnormal motor behavior (including catatonia), and negative symptoms. Unlike the DSM-IV, diagnoses are organized in the chapter along a gradient of psychopathology, and the DSM-5 raises the threshold for diagnosis of schizophrenia. This is to aid clinicians' diagnoses of limited symptom or time-limited psychotic disorders. Delusional disorders are defined first by the presence of one or more delusions for at least 1 month and no other psychotic symptoms. No longer do delusions have to be nonbizarre as described in the DSM-IV for a patient to receive a diagnosis of delusional disorder. The specifier delusional disorder with bizarre content is added with the DSM-IV delusional disorder specifiers including erotomanic and somatic types. Additional specifiers are available to account for the chronic nature of delusional disorders and used for those with a delusional disorder longer than a year. These specifers describe the number and severity of episodes of delusional thinking (e.g., first vs. multiple, acute vs. full remission).

Brief psychotic disorder is diagnosed in those who can have one or more psychotic symptoms that last 1 day but less than 1 month who return to premorbid levels of function. The DSM-5 now provides specifiers to brief psychotic disorder including 1) with marked stressors, 2) without marked stressors, 3) with postpartum onset, and 4) with catatonia. Schizophreniform disorder is characterized with the same symptoms of schizophrenia except duration of symptoms are for less than 6 months and schizophreniform disorder does not require a decline in functioning. It has the same specifiers of with or without good prognostic features, and in the DSM-5, catatonia is available as an additional specifier. Schizophreniform disorder spans the spectrum of psychotic disorders not due to a substance or medical condition that last longer than a brief psychotic episode but does not meet the 6-month duration criteria for a diagnosis of schizophrenia. However, in the DSM-5 if a patient meets diagnostic criteria for schizophrenia but does not meet the 6 month duration of symptoms, a diagnosis of schizophreniform disorder (provisional) is given until symptoms remit. If symptoms persist for 6 months a diagnosis of schizophrenia is made.

There were relatively few changes to the DSM-5 diagnostic criteria for schizophrenia as defined in the DSM-IV. However, for a patient to meet DSM-5 criteria for a diagnosis of schizophrenia, at least two psychotic symptoms must be present for at least 6 months with 1 month of active symptoms [21]. In contrast to DSM-IV, to meet a diagnosis of schizophrenia with the DSM-5, one of the two Criteria A symptoms must be delusions, hallucinations, or disorganized speech to more reliably diagnose schizophrenia based on core positive

**Table 1** DSM-5 schizophrenia spectrum and other psychotic disorders [4••] (Note: Schizotypal personality disorder is described in the DSM-5 section on personality disorders)

| Diagnosis | Associated features |
|---|---|
| Delusional disorder | Isolated delusions in absence of other psychotic symptoms |
| Brief psychotic disorder | Transient psychosis with return to premorbid functioning |
| Schizophreniform disorder | Sub-syndromal schizophrenia with multiple psychotic symptoms of duration longer than 1 month and less than 6 months |
| Schizophrenia | Two or more psychotic symptoms for 6 or more months |
| Schizoaffective disorder | Psychotic symptoms for 2 weeks in the absence of mood symptoms and symptoms that meet criteria for a mood episode during a majority of the duration of illness |
| Substance/medication-induced psychotic disorder | Psychotic symptoms the direct result of a substance or medication |
| Psychotic disorder due to another medical condition | Psychotic symptoms the direct result of a medical condition |
| Catatonia (specifier) | Used to describe psychiatric disorders but can have catatonia due to medial conditions, etc. |
| Other specified schizophrenia spectrum and other psychotic disorder | Other psychotic disorders that do not meet criteria for another disorder. |
| Unspecified schizophrenia spectrum and psychotic disorder | Psychotic disorder due to unknown or undetermined causes |
| Schizotypal personality disorder | Pervasive pattern of reduced capacity for close relationships as well as cognitive and perceptual distortions |

symptoms seen in the illness. A diagnosis of schizophrenia can no longer be given if only one symptom such as a bizarre delusion or only prominent auditory hallucinations is present as described in the DSM-IV. New episode duration and severity specifiers are available with the DSM-5 diagnosis of schizophrenia and include first, multiple, and continuous episodes that can be acute, continuous, or in partial or full remission. No longer does the DSM-5 distinguish subtypes of schizophrenia, including the paranoid type, due to lack of clinical utility and heuristic value. In schizoaffective disorder, schizophrenia and mood symptoms coexist, but mood symptoms must be preceded by at least 2 weeks of psychotic symptoms without prominent mood symptoms. Schizoaffective disorder also now has episode duration and severity specifiers similar to schizophrenia and other disorders. Of importance, the DSM-5 now highlights suicide risk when diagnosing individuals with schizophrenia or schizoaffective disorder.

Other described psychotic disorders in the DSM-5 are the direct result of a physiological state or substance, of an unspecified cause, or with subsyndromal symptoms. Substance/medication-induced psychotic disorders can be specified as with onset during intoxication or withdrawal. Specifiers including disorders with delusions or with hallucinations, depending on the prominent symptom, can be used to describe psychotic disorders due to a physiological state or substance.

Psychotic disorders that do not meet DSM-5 criteria for any of the aforementioned conditions are given a diagnosis of other specified schizophrenia spectrum disorder and other psychotic disorder. These disorders can include but are not limited to patients who present with persistent auditory hallucinations, an attenuated psychosis syndrome [22], delusional symptoms in partner of individuals with delusional disorder (shared psychotic disorder), etc. The diagnosis of other specified schizophrenia spectrum disorder attempts to capture subsyndromal or atypical presentations of psychotic disorders in an effort to reduce NOS diagnoses. For instances in which patients do not meet criteria of any known schizophrenia or psychotic spectrum disorder and in whom the cause of psychosis is not determined, those individuals are given a diagnosis of unspecified schizophrenia spectrum and other psychotic disorder.

For the first time, catatonia is uniquely classified in the DSM-5 as a psychotic symptom associated with many causes. Catatonia can be used as a diagnostic specifier (e.g., bipolar I disorder with catatonia) or as a unique diagnosis due to a known cause (e.g., catatonia due to encephalitis). Additional dimensional measures for psychosis are available in Section III of the DSM-5 for clinical and research purposes. Diagnostic crosscutting measures are provided to assess for mood and cognitive symptoms in schizophrenia and psychotic spectrum disorders since such symptoms are often present and have treatment implications in addition to prognostic value.

## Toward a Valid and Reliable Diagnosis

The DSM has undergone significant criticism related to its construct validity [23]. Despite significant advances in better understanding the pathophysiology of mental illnesses, there are no well-established biological tests for mental disorders. Diagnosis is based on clinical interview and observation, and since the 1970s, the validity of psychiatric diagnoses has been based on experts' consensus who periodically review available research prior to making diagnostic recommendations in

the DSM [7]. An influential 1974 paper by Robert Spitzer demonstrated that the DSM-II was an unreliable diagnostic tool [23]. He showed poor diagnostic reliability after observing that different practitioners using the DSM-II were rarely in agreement when diagnosing patients with similar problems. In reviewing previous studies of 18 major diagnostic categories, no diagnostic categories had high diagnostic reliability. Reliability appeared to be only satisfactory for three categories: mental deficiency, organic brain syndrome (but not its subtypes), and alcoholism. The diagnostic reliability was shown to be no better than fair for psychosis and schizophrenia and is poor for the remaining diagnoses. An effort to examine and improve the reliability of diagnosing psychiatric disorders was expanded with implementation of field trials with the DSM-III. Field trials help assess the reliability of a psychiatric diagnosis by examining how consistently two clinicians assessing the same patient will arrive at the same diagnosis.

The DSM-5 field trials were conducted at a variety of clinical academic sites and completed in 2012. The field trials sought to assess the clinical utility, feasibility, and inter-rater reliability of DSM-5 diagnoses and test new crosscutting measures [11•, 19•, 24•]. The primary goal of the DSM-5 field trial was to assess how reliably two clinicians performing non-structured psychiatric diagnostic interviews using DSM-5 criteria would diagnose the same condition in the same patient. Inter-rater reliability coefficients of categorical diagnoses were measured using intraclass kappa coefficients to estimate standard errors of less than 0.1 [25, 26•]. Kappa coefficients are considered a conservative measure of agreement, and for the DSM-5 field trial coefficients of 0.8 and above were defined as "excellent"; 0.60 to 0.79 "very good"; 0.40 to 0.59 "good"; 0.20 to 0.39 "questionable"; and values below 0.2 "unacceptable" [26•]. Crosscutting dimensional measures were introduced in the DSM-5 to help clinicians assess for variations of symptoms within and across diagnoses (e.g., mood and manic symptoms in schizophrenia). This approach allows for more nuanced longitudinal tracking of patients' symptoms over time. Psychotic disorders whose inter-rater diagnostic reliabilities were tested in the DSM-5 field trial include: 1) attenuated psychosis syndrome, 2) schizophrenia, 3) schizoaffective disorder, and 4) schizotypal personality disorder.

Data from the DSM-5 field trial using the updated diagnostic criteria for schizophrenia and schizoaffective disorder demonstrated "good" inter-rater reliability with intraclass kappa statistics of 0.46 and 0.50, respectively [24•]. Attenuated psychosis syndrome was not included and schizotypal personality disorder included as diagnoses in the DSM-5, but when tested in the field trial, adequate kappa scores could not be obtained due to low sample size [19•]. Attenuated psychosis syndrome was proposed as a diagnosis to identity those with sub-threshold psychotic symptoms in an effort to earlier identify those who later develop a psychotic disorder [22]. However, not enough subjects were identified in the DSM-5 field trial to lead to addition of an attenuated psychosis syndrome diagnosis. Attenuated psychosis syndrome was added to Section III of the DSM-5 to promote further research on this condition.

The DSM-5 is the culmination of a long-standing collaboration between the APA and the NIMH. In parallel to development of the DSM-5, the NIMH began the Research Domain Criteria (RDoC) project in 2009 to develop a research classification system for mental disorders based upon dimensions of neurobiology and observable behavior [27]. RDoC supports research to explicate fundamental biobehavioral dimensions that cut across current heterogeneous disorder categories [28]. Advances in neuroscience and diagnostic instruments in addition to work developing RDoC's will complement and enhance ongoing efforts to provide convergent validity when describing and diagnosing mental disorders. Furthermore, for the first time in history, the APA is attempting to make the DSM a living document where feedback and updates on diagnostic criteria will be reviewed and provided [29]. To date, the DSM-5 is the most reliable and useful guide for psychiatric diagnosis when used in a clinical setting, but significantly more research on the pathophysiology and neurobiology of mental illness, including schizophrenia and other mental disorders, is needed to improve the diagnostic validity and utility of the DSM.

## Conclusion

Mental disorders have long been described throughout history, and the DSM provided the first clinical diagnostic manual and nosology for assessment of psychiatric disorders. The DSM was created with the simple goal of providing a useful and more reliable diagnostic approach when treating psychiatric disorders and applicable in a wide range of contexts. A goal of the DSM is to use available scientific evidence to refine diagnosis and associated clinical features based on genetics, development, etc. [30]. It is used by a variety of clinicians and researchers of many orientations (biological, psychodynamic, cognitive, etc.) and avoids subscribing to schools of thought. The validity of the DSM is most limited by the lack of scientific evidence providing a better understanding of mental illness [31].

Development of the DSM coincides with long-standing efforts to better understand schizophrenia and related psychoses. The influential work of Kraepelin and Bleuler provided the diagnostic foundation for schizophrenia, and diagnostic descriptions of schizophrenia exist through all versions of the DSM. Despite advances in understanding the neuroscience of schizophrenia, relatively few changes have been made to the diagnosis since the DSM-III was published in 1980. Schizophrenia is generally described as a syndrome including the presence of multiple psychotic symptoms that occur for a specified duration of time with impairment in function in the absence of other known causes. More recent changes to diagnosing schizophrenia are reflected in the DSM-5 where

schizophrenia and related disorders are characterized along a spectrum. The threshold for diagnosing schizophrenia has increased, subtypes of schizophrenia have been eliminated, and additional specifiers are available to better characterize the course and severity of psychotic disorders.

Ongoing collaborative efforts between the APA, NIMH, WHO, and community-at-large will lead to further refinements in psychiatric diagnosis. As of publication of the DSM-5, the validity of psychiatric diagnoses remains based on expert consensus and diagnostic reliability of psychiatric diagnoses is limited. However, with ongoing efforts to better understand the pathophysiology of psychiatric illnesses, data will be provided to ultimately establish convergent validity of psychiatric diagnoses. When this occurs it is expected that psychiatric diagnoses will be more accurately and reliably diagnosed and will open the way to developing more effective treatments.

#### Compliance with Ethics Guidelines

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**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by the author.

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- •• Of major importance


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