

Integrating Non-Psychiatric Models of Delusion-Like Beliefs into Forensic Psychiatric Assessment

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In both clinical and forensic psychiatry, it can often be difficult to distinguish delusions from normal beliefs. The categorical approach of the Diagnostic and Statistical Manual of Mental Disorders (DSM) leaves few options to describe intermediate delusion-like beliefs (DLBs). Neurocognitive models offer an alternative view of DLBs as existing on a continuum that can be quantified based on dimensions of severity as well as underlying cognitive biases. The Internet provides broadened access to putative evidence for diverse beliefs, with filter bubbles and echo chambers that can amplify confirmation bias and strengthen conviction. It is therefore much easier now for fringe beliefs to be shared and much less clear when they should be considered delusional. To place DLBs into a forensically relevant framework, psychiatric expert witnesses should adopt a broad biopsychosocial understanding of belief formation and maintenance that integrates clinical expertise with knowledge about dimensional aspects of delusions, cognitive biases, and the processing of online misinformation. The unavoidable conclusion that normal thinking is replete with cognitive biases and misbeliefs challenges the legal concept of *mens rea* that forms the foundation of a retributivist American justice system.

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Because beliefs seem to shape our expectations and guide our behavior, forensic experts are often called upon to assess them as underlying motivations for criminal acts. The main purpose of such psychiatric evaluation is to determine whether beliefs are symptomatic of mental illness, with implications for culpability and *mens rea*. Assessing the pathological nature of beliefs is fraught with challenges, however, including the limited options in the Diagnostic and Statistical Manual of Mental Disorders (DSM) for the characterization of delusion-like beliefs (DLBs), the expanded cultural sanctioning of fringe beliefs in the age of the Internet, and the potentially conflicting agendas of clinical and forensic psychiatric evaluation.

Delusions and DLBs in the DSM

Since publication of the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-

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III), psychiatric diagnosis has been based on categorical disorders defined by symptom criteria. Symptoms themselves are discussed throughout the subsequent editions of the DSM, with brief definitions listed in its glossary. Tethered to the DSM, both clinicians and forensic experts are limited to a narrow differential diagnosis of pathological beliefs that mostly hinges on the dichotomous evaluation of whether a belief is delusional.

Informed by the work of Karl Jaspers, the DSM has maintained throughout its revisions a basic definition of delusions as fixed, false beliefs.^{1,2} When the more detailed DSM definitions have been examined more closely, they have been criticized on various grounds,^{1,3,4} including their problematic application to forensic psychiatry.⁵ Foundationally, the DSM defines delusions as beliefs, although some critics have disagreed with this premise,⁶ and belief itself remains undefined in psychiatry.

Much of the practical difficulty with evaluating delusions arises when they are shared. Following Jaspers' conceptualization of delusions as impossible and unshareable,^{2,5} delusions have been distinguished from shared and culturally sanctioned beliefs since the DSM-III-R. Serial versions of "shared psy-

chotic disorder” were included from DSM-III to DSM-IV as a separate option to account for shared delusions, but this diagnostic category was eliminated in DSM-5. Earlier DSM definitions equated the impossibility of delusional beliefs with the term “bizarre.” Due to the inability to prove some beliefs false and poor inter-rater reliability for what is possible or impossible,^{7,8} however, the diagnostic relevance of bizarre delusions was also abandoned in DSM-5. Clinicians and forensic evaluators are therefore left with few options to differentiate delusions from religious and political beliefs that are shared within subcultures but are extreme, functionally impairing, or associated with criminal behavior.^{9,10}

Although not specifically listed as a symptom of any particular mental disorder, the term “overvalued idea” was first included in DSM-III-R to describe beliefs held with less than delusional conviction. It remains in the glossary of DSM-5, although previous reference to overvalued ideas as difficult to distinguish from delusions has been replaced with the term “strongly held idea” (Ref. 11, p 87). As it has with delusions, the DSM has always distinguished overvalued ideas from shared cultural and subcultural beliefs, despite the fact that both Carl Wernicke, the term’s originator, and Jaspers both regarded overvalued ideas as potentially shareable, not unlike political and religious beliefs.^{10,12} Recognizing this diagnostic straightjacket, some authors have recently proposed the new term “extreme overvalued belief” to account for shared, non-delusional beliefs that have confounded forensic evaluations of terrorist crimes.^{10,13}

Non-Psychiatric Models of DLBs

The idea that beliefs can be pathological is a core principle in psychiatric nosology, where the categorical definition of delusion conversely implies that normal, non-delusional beliefs are rational and evidence-based. As a discipline that extends its focus beyond the pathological, psychology offers the contrasting, dimensional perspective that normal and pathological beliefs exist on a continuum, with normal beliefs not as rational or evidence-based as they might seem.

DLBs as Cognitive Distortions

Cognitive distortions have been a foundational concept of cognitive behavioral therapy since Aaron Beck introduced the term in the 1960s. Beck reported that patients with depression had “cogni-

tions,” or thoughts, with “systematic deviations from realistic and logical thinking” (Ref. 14, p 331) and “varying degrees of distortion of reality” (Ref. 14, p 328) that were “similar to [those] described in studies of schizophrenia” and “may be common to all types of psychopathology” (Ref. 14, p 331). While definitions vary, cognitive distortions can be thought of as errors in cognitive content and information processing¹⁵ or, more simply, as errors of belief and how we arrive at and maintain them. Unlike the categorical definitions of DLBs in the DSM, cognitive distortions refer to underlying mechanisms of belief formation within a larger neurocognitive model that seeks to account for a continuum of beliefs spanning the normal to the delusional.¹⁶ Cognitive distortions have been conceptualized as relevant to not only psychiatric disorders like schizophrenia and depression, but also to the understanding of problem behaviors such as pathological gambling¹⁷ and child molestation.^{15,18,19}

Conceptualizing beliefs within the framework of cognitive psychology illustrated above results in the alternative view that DLBs are more accurately modeled not as categorically or qualitatively different types of belief, but rather as quantitative variants across belief dimensions such as conviction, preoccupation, and distress.^{9,20–22} A large body of research now supports the idea that delusional thinking can also be explained by the presence of specific cognitive biases including the “jumping to conclusions” bias, attributional biases, theory of mind deficits, and belief inflexibility.^{23–27} Within this conceptual framework, beliefs themselves are not pathological so much as are the cognitive mechanisms that underlie their formation.

Although one of the main purposes of the DSM has been to assist clinicians in distinguishing mental health from mental illness,^{28,29} there is now ample evidence to support the idea that psychosis is distributed along a continuum that includes individuals with and without mental illness.^{30–33} The rate of delusions and DLBs detected in surveys of general population samples varies broadly from 1.3 to 91 percent,^{34–37} including 47 percent reporting paranoid ideation³⁸ and 66–79 percent endorsing paranormal beliefs.^{37,39} In the DSM, diagnostic options to account for the grey areas of a psychotic continuum, where those with less than full-blown psychotic symptoms exist, include the “cluster A” personality disorders (e.g., schizotypal, paranoid, and schizoid),

the wastebasket category “psychosis, not otherwise specified (NOS)” (renamed “unspecified schizophrenia spectrum and other psychotic disorder” in DSM-5), and “attenuated psychosis syndrome” (listed for the first time in DSM-5 as a condition for further study). In psychology, the psychotic spectrum is represented by the concept of “psychosis proneness” and the cognitive biases that underlie this trait. As with delusions themselves, delusion proneness has been linked to the jumping-to-conclusions reasoning style,^{40–42} self-serving bias,⁴³ and belief-bias attributions.⁴⁴

Normal Misbelief and Conspiracy Theories

Looking beyond the psychotic spectrum, cognitive psychology has devoted significant attention to the cognitive biases that underlie normal belief. Cognitive distortions such as all-or-none thinking, overgeneralization, jumping to conclusions, magnification and minimization, and personalization are targets of cognitive behavioral therapy in the treatment of depression, but they are also prevalent in those without mental illness.⁴⁵ Tversky and Kahneman famously proposed that normal people make judgments based on information processing shortcuts or “heuristics” that are subject to bias and error.⁴⁶ This work paved the way for subsequent research that has now firmly established the existence of “cognitive illusions” that amount to myriad normal misbeliefs.^{47–48} Although many such illusions are thought to be positive, conferring potential evolutionary advantage by enhancing psychological well-being (e.g., unwarranted optimism, unrealistically positive self-appraisals, illusions of control), others confound evolutionary explanation through their potential to impair functioning.^{48–51} For example, cognitive biases such as confirmation bias,⁵² cognitive dissonance,⁵³ and the Dunning-Kruger effect⁵⁴ (whereby overconfidence in personal knowledge is greatest among those with the lowest actual knowledge) can interfere with knowledge acquisition and evidence appraisal, giving rise to false beliefs. According to error-management theory, the systematic cognitive biases that govern information processing may result in misbeliefs that are at odds with reality but remain adaptive overall.^{49,51,55,56} Still, it is hard to deny that cognitive biases and their resulting misbeliefs can sometimes have significant negative effects on societal functioning. Relevant to forensics, implicit bias is associated with racially biased

policing⁵⁷ and criminal sentencing,⁵⁸ and memory biases are known to contribute to the malleability and fallibility of eye-witness accounts.⁵⁹

The idea that cognitive biases may be perpetuated through evolutionary advantage but can be problematic in modern social functioning might help explain phenomena like conspiracy theories.⁶⁰ Belief in conspiracy theories has been correlated with higher levels of normally distributed psychological traits including certain attribution and perceptual biases^{61–63}; conjunction fallacies⁶⁴; need for certainty, cognitive closure, and uniqueness⁶⁵; and with schizotypy in general.⁶⁶ Research to date indicates, however, that conspiracy beliefs are otherwise normal⁶⁰; a nationally representative survey found that half of the U.S. population believes in at least one conspiracy theory.⁶⁷ While there is little evidence to support that belief in conspiracy theories is necessarily associated with functional impairment, without a doubt some conspiracy theorists find their way into the legal system. One illustration is the 2016 case of an individual who brought a semi-automatic rifle into a pizzeria to “self-investigate” whether it was housing a child sex-trafficking ring affiliated with Hillary Clinton.^{68,69} On a larger scale, it has been argued that conspiracy theories involving anti-science beliefs can have a profoundly negative impact on public health (e.g., anti-vaxxers) and environmental policy (e.g., climate-change deniers).^{70,71}

DLBs in the Internet Era

An alternate view of subculturally shared religious, political, and conspiracy beliefs is that they are best understood as memes. The term meme was originally coined by the evolutionary biologist Richard Dawkins to describe self-perpetuating cultural entities, including ideas and beliefs.⁷² It has been suggested that memes, or meme complexes (“memplexes”), can account for popular myths such as religious beliefs and folk beliefs in the soul or in a conscious self that directs our actions.⁷³ More recently, the concept of an Internet meme has been widely adopted to describe memes that are propagated via the Internet. The shareability of DLBs is vital to their proper classification, but the Internet now makes sharing beliefs possible in a way that Jaspers and the authors of the DSM before DSM-5 could never have anticipated.

The online shareability of otherwise unshareable beliefs can occur through large-scale access to millions of potential confederates whose agreement sup-

plies the putative evidence for even the most fringe beliefs, along with digital biases programmed into search engines and social media sites that can shape, strengthen, and propagate beliefs. The Internet provides rapid and historically unprecedented access to information, but also to misinformation, opinions portrayed as facts, and deliberate hoaxes (e.g., “trolling”) that can plant the initial seeds of false belief. Recent research indicates that false news spreads faster and more extensively online than does true news.⁷⁴ While divulging unconventional beliefs in small social circles is likely to elicit opposition, anonymous online users can gain immediate widespread access to potentially like-minded individuals with the press of a button. As with belief formation in general, the process of assessing the veracity of online information and finding support for unconventional beliefs is highly susceptible to confirmation bias, with Internet users selecting and sharing content that supports their preexisting beliefs while ignoring content that does not. This process is fueled by the aggregation of users into homogeneous user clusters or echo chambers, where exposure to opposing beliefs is limited.⁷⁵ In addition, Internet machine-learning algorithms geared toward the personalization of content based on online preferences segregate information within “filter bubbles” that show us more of what we want to see.⁷⁶ Meanwhile, when searching the Internet for explanatory knowledge, access to information can give the false impression of personal understanding of that information, solidifying beliefs without actually enhancing knowledge.⁷⁷

Although recent studies suggest that the influence of echo chambers and filter bubbles on restricting exposure to diverse viewpoints has been overestimated,^{78,79} the Internet clearly has the potential to increase exposure to misinformation, grant greater access to others who might share unconventional beliefs, strengthen belief conviction in general, and result in group polarization around opposing beliefs, representing an enhanced confirmation bias. At the very least, the potential effects of the Internet illustrate how the formation and maintenance of beliefs and DLBs do not occur exclusively within the vacuum of an individual’s mind, but are influenced by social forces, digital or otherwise. As an example, Morgellons Syndrome is generally regarded as a variant of delusional parasitosis that has been propagated through the Internet,⁸⁰ although it has also been modeled by some investigators as a true dermatologic

disease.⁸¹ If it does represent a form of delusional disorder, it confounds the DSM definition of delusions as unshared beliefs and might be better understood as an Internet meme.⁸²

Characterizing DLBs that have been propagated online has been integral to the litigation of so-called “sovereign citizens” who have been charged with shirking the law based on a variety of false beliefs about the U.S. government, most notably the unconstitutionality of income tax. While initial defense strategies claimed incompetence to stand trial due to apparent delusional thinking and idiosyncratic pseudolegal rhetoric, the shared nature of the sovereign-citizen doctrine and its widespread online availability has rendered that defense fruitless.^{83,84} A potentially successful defense became possible, however, following the 1991 Supreme Court ruling in *Cheek v. United States*⁸⁵ that a “genuine, good faith belief” that one is not violating federal tax law can be used as evidence against the Internal Revenue Service tax code requirement of “willfulness” for *mens rea*.⁸⁶ This so-called Cheek defense allows that good faith ignorance of the law could be claimed for sovereign citizens who are tax deniers, based on belief in online misinformation presented as fact, but not for tax protestors who violate known law based on claims of unconstitutionality. The litigation of sovereign citizen cases may therefore hinge upon the precise categorization of misbeliefs by a psychiatrist, although expert witnesses must be careful to avoid violating Federal Rule of Evidence 704(b), which prohibits providing an opinion about “whether the defendant did or did not have a mental state or condition that constitutes an element of the crime charged or of a defense.”⁸⁷ This provides something of a tightrope to navigate for forensic experts who are asked to provide a psychiatric opinion of a tax denier’s beliefs but cannot explicitly opine as to whether their beliefs and corresponding actions represented “good faith.”

Competing Clinical and Forensic Utilities

It has been argued that the borders of mental illness are best understood as dimensionally fluid guideposts rather than immutable categorical boundaries.^{29,88,89} Although continuum models of psychiatric disorders and symptoms might better reflect reality, the main purpose of the DSM has been to increase diagnostic reliability and to guide treatment, where clinical decision-making favors firm boundaries. With clinical utility as a guiding principle for DSM revisions, a cate-

gorical approach has been maintained with mental disorders defined as syndromes based on symptom criteria. Nonetheless, navigating the ambiguity of psychiatric diagnosis to make clinical decisions is routine in psychiatry, with the DSM intentionally leaving ample room for clinical judgment.

In forensic work, with the inherent opposition between prosecution and defense, ambiguity is less well tolerated and often results in two conflicting expert opinions. Although forensic psychiatry prefers “crisp” boundaries to define “legal insanity,”⁹⁰ the threshold to define mental disorder when applying psychiatric diagnosis to judgments of culpability might be different than it is in clinical practice, where the bar is often lowered to maximize help for treatment-seeking individuals.^{29,88,89} This mismatch in defining “caseness” illustrates how the use of the DSM in different settings can have competing contextual utilities and why the rules of diagnosis set forth in the DSM make an “imperfect fit” (Ref. 11, p 25) with forensic questions about involuntary treatment, issues of capacity and competency, evaluations of moral and legal responsibility, and criminal sentencing.^{29,89,91,92} This point is underscored in the “Cautionary Statement for Forensic Use” chapter in DSM-5.¹¹ In clinical work, distinctions between delusions and other DLBs are intended to guide evidence-based intervention, not to provide evidence for an insanity defense.

Conflicts between the competing contextual utilities of clinical and forensic psychiatry have been well illustrated in recent years by the legal application of a DSM paraphilia diagnosis (especially pedophilia and the unofficial categories “paraphilia NOS, nonconsent” and “paraphilia NOS, hebephilia”) to mandate indefinite civil commitments for convicted sexually violent offenders upon completion of their prison sentences.^{92–94} In doing so, the courts have equated DSM diagnosis with volitional impairment or loss of control, although that is not a defining feature of paraphilia in DSM-IV or paraphilic disorders in DSM-5.^{92,95} This intentional conflation has been rationalized based on a goal of protecting the public from sexually violent predators, at the expense of their civil rights of due process through a form of double jeopardy.⁹⁶ It has occurred despite explicit statements in DSM-IV and DSM-5 cautioning against conflating psychiatric diagnosis (including specific reference to pedophilia) with legal defini-

tions of mental disorder or any implications about control over behavior.¹¹

Some authors have argued that paraphilias should not be considered mental disorders at all⁹⁷ and that pedophilia, not unlike homosexuality, might be better characterized as a sexual orientation.^{98–100} Such a proposition would shift pedophilic behavior into the same category as rape, as an illegal and morally objectionable act by Western standards, but one not to be confused with evidence *per se* of a mental disorder. As noted earlier, however, child molestation has also been modeled in cognitive terms, with cognitive distortions and cognitive dissonance providing a framework to understand why some people violate cultural taboos and laws.^{15,19} According to this model, child molesters rationalize or excuse their behavior based on core misbeliefs that are at odds with cultural norms. Although this view has gained a wide following and forms the basis of many existing interventions for sexual offenders, “cognitive distortion” in this context has also been criticized as a wastebasket term to describe a variety of beliefs, justifications, perceptions, excuses, defenses, rationalizations, denials, and minimizations in isolation of external forces governing belief formation.^{101,102}

Ultimately then, forensic experts face a conundrum when attempting to explain abnormal and sometimes criminal behavior in pathological terms (e.g., cognitive distortions, overvalued ideas, etc.) when there is no clear mental disorder to speak of. Conversely, trying to account for dysfunctional behavior by framing unconventional beliefs in cognitive terms can lead one down a slippery slope to conclude that everyone has pathological beliefs, that belief formation occurs largely through unconscious processes, and that free will and moral responsibility do not exist.¹⁰³ Those would be inconvenient truths for the existing American criminal justice system.

Integration Through “Cognitive Psychiatry”

Within the contextual utility of diagnosis in forensic psychiatry, a major shortcoming of categorical definitions of DLBs is that they reveal little to juries about how it is possible for non-psychotic individuals to hold unconventional beliefs and sometimes act on them in ways that get them into legal trouble. To tell that story, forensic experts must draw upon not only knowledge of categorical DSM diagnoses and DLB definitions, but clinical experience and biopsy-

chosocial formulations of the defendant in question. In the era of the Internet, expertise regarding how beliefs are shaped and sustained by dynamics within groups ranging in size from dyads (e.g., *folie à deux*) to larger, closed groups (e.g., cults) must now include knowledge of what leads people to form DLBs based on online evidence and to resist the correction of misinformation within filter bubbles and echo chambers.^{104–106}

Supplementing that expertise with a cognitive perspective on individual belief acquisition and maintenance can help round out a holistic perspective, providing a means to characterize where a DLB might fall on a continuum without the necessity of pinpoint categorization. For example, it has been argued that religious delusions might be best distinguished from religious faith by quantifying them along dimensions of preoccupation, conviction, and distress rather than focusing on content or whether the beliefs are shared.⁹ This same approach can be extended to the range of DLBs in general, regardless of theme. A number of validated scales can be useful in such assessment, including the Peters *et al.* Delusional Inventory,²¹ the Brown Assessment of Beliefs Scale,¹⁰⁷ and the Conviction of Delusional Beliefs Scale.¹⁰⁸ Cognitive models of delusion can also provide a framework to account for how individuals adopt and maintain unconventional beliefs. The “two-deficit” or “two-factor” model suggests that delusions and DLBs can arise from anomalous perceptual, emotional, or autonomic experiences along with faults of cognitive processing, whether pathological or not (e.g., cognitive biases or “doxastic inhibitory failures”).^{16,24,109} Psychiatrists with clinical experience should already be well-versed in the assessment of anomalous experiences (e.g., hallucinations, misidentification syndromes, body-image distortions, etc.) but might be less familiar with cognitive biases. In addition to collaboration with a cognitive psychologist, tools like the Cognitive Biases Questionnaire for Psychosis could be helpful in assessing how an individual’s cognitive biases affect their beliefs.¹¹⁰ Both forensic expertise and psychometric scales can likewise assist in the detection of malingering, when endorsement of anomalous experiences and belief conviction are being simulated.¹¹¹

DLBs and *Mens Rea*

It has been argued that the insanity defense arose as a necessary corollary to a criminal justice system based on retribution and punishment rather than as a

humanitarian protection for the mentally ill.¹¹² Psychiatric definitions of psychosis, delusional thinking, or cognitive deficits are relevant to, but altogether distinct from, definitions of legal insanity that are rooted in historical notions and folk intuitions about moral responsibility. In most U.S. states, not guilty by reason of insanity (NGRI) pleas therefore require not only negation of *mens rea*, but impairment of moral reasoning (i.e., knowing right versus wrong per *M’Naughten*¹¹³) or loss of control per the American Law Institute’s Model Penal Code.¹¹⁴ Aside from the most clear-cut examples of idiosyncratic and self-referential delusional thinking, other DLBs and shared delusions in particular have generally not been considered adequate to demonstrate diminished capacity.^{83,115,116} Within forensic psychiatry, it seems that the proposal of terms like “extreme overvalued beliefs” has been in the service of carving out a new category to explain unusual beliefs and morally outrageous behavior while ensuring that culpability remains intact.

The 1954 Durham Rule¹¹⁷ that all but equated the presence of relevant delusions with diminished capacity has since been abandoned, but delusions and DLBs remain highly pertinent to judgments of *mens rea*, not only for NGRI pleas but for evaluations of competency to stand trial, plea bargaining, and sentencing.¹¹⁸ Although the opinion of psychiatric experts can inform such judgments, various laws have limited their scope (e.g., *State v. Mott*,¹¹⁹ California Penal Code Section 28,¹²⁰ Federal Rule of Evidence 704(b),⁸⁷ etc.) with rulings ultimately left for judges and juries to decide based on their own variably liberal or conservative perspectives on retributive justice and evolving case law.¹²¹

The modeling of delusions, DLBs, and even normal beliefs as qualitative and quantitative variants with underlying cognitive biases opens the door to the negation of *mens rea* not only for individuals, but as a valid legal concept. This slippery-slope argument dovetails with broader neurocognitive theories positing that consciousness and the illusion of free will are but epiphenomena of the unconscious systems that actually govern human behavior.^{103,122} At first glance, such models might predict that “the present foundations of law and morality rooted in agentic personhood would collapse” (Ref. 123, p 1134), but on closer examination they might simply pave the way to replacing case-by-case evaluations of moral culpability with universal agentic responsibility.¹²⁴

This model does not therefore threaten rule of law, but it may warrant a shift from a retributivist justice system to one based more upon consequentialist principles.^{103,125} In such a system, delusions and DLBs would be largely irrelevant to the determination of criminal culpability, but would be closely tied to pragmatic sentencing that might err on the side of greater access to psychiatric treatment and rehabilitation rather than punitive incarceration.

Conclusion

When asked if he were gay, the late free jazz pianist Cecil Taylor is said to have responded, “Do you think a three-letter word defines the complexity of my humanity? I avoid the trap of easy definition.”¹²⁶ Given our limited understanding of the complexities of belief, it appears that DLBs likewise defy easy definition. Moving beyond the futility of further categorization, DLBs are better conceptualized as a quantifiable continuum in which their underlying cognitive mechanisms are not the exclusive domain of mental illness and instead extend well into normalcy. Although cognitive flexibility and, more specifically, belief flexibility would probably be a healthier mindset for optimal social functioning,¹²⁷ this is not necessarily an attribute of normal human cognition where biases, motivated reasoning, and misbeliefs can reign supreme.^{37,40,49,128} This unavoidable conclusion helps to understand why seemingly normal people can hold unconventional beliefs that sometimes cause them to behave in very abnormal ways.

Working backward through the void of any universally accepted definition of belief in psychiatry, psychology, or philosophy, I propose that beliefs be defined as “cognitive representations of past, present, and future reality, encompassing our inner experiences, the world around us, and the world beyond.” From this foundation, forensic experts can then draw from non-psychiatric disciplines to adopt a more nuanced model of DLBs as biased cognitions, conspiracy theories, and Internet memes with common underlying cognitive mechanisms that might better inform legal proceedings.

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