The Anatomy of Vaccine Hesitancy: Folk Skepticism as Worldview in the Language and Rhetoric of Online Communities

Arden Hegele[1,3,5], Dennis Yi Tenen[1,3,5], Elena Fratto[2,5], and Rishi Goyal[3,4,5]

[1] Department of English and Comparative Literature, Columbia University, New York, USA
[2] Department of Slavic Languages and Literatures, Princeton University, Princeton, USA
[3] Institute for Comparative Literature and Society, Columbia University, New York, USA
[4] Department of Emergency Medicine, Columbia University, New York, USA
[5] Health Language Lab, Narrative Intelligence Lab, Incite at Columbia University, New York, USA

Abstract

How do people communicate their stories about vaccination in anonymous online spaces? Through empirical narrative and linguistic analysis, this article explores the structural and rhetorical features used by laypeople who express their vaccine hesitancy online. Focusing on a case study sampled from millions of vaccine-hesitant posts our lab collected from a range of online platforms between 2020 and 2024, we closely examine the distinct narrative features of what we term "folk skepticism": an emerging modality for communicating knowledge about health and illness, which blends an imitative register of expert authority with extant lay folkloric traditions. Finding that folk-skeptical structures shape how ordinary people influence one another's health beliefs and build counter-narratives that challenge evidence-based science, in the end, we offer recommendations for how an attunement to the narrative features of folk skepticism might be repurposed positively to strengthen health promotion efforts.

Keywords: vaccine, vaccine hesitancy, folktale, folklore, folk knowledge, pseudoscience, online communities

1 Introduction

"My 76-year-old mother has some osteoarthritis and a little high blood pressure, but not concerned [*sic*]. After the first Moderna vaccine she began to have problems with one eye."

So reports one of the millions of vaccine-hesitant posts our lab has collected, catalogued, and studied from various online forums, including Facebook groups dedicated to "vaccine victims," YouTube comments to pro- and anti-vaccine messages, and several prominent Telegram channels.

"My father is 83 years old, without pathologies," the same online poster continues. "After being vaccinated with Pfizer he is more tired and has developed eczema. A friend got uveitis [eye inflammation] after 2 doses of Pfizer." In conclusion: "There are two other cases that ended in death, but I would have to make sure of the possible relationship with the vaccines."

On a first reading of this online post, a few observations suggest themselves. Note the general structure of the post: it seeks to resemble a patient history, a narrative form used by medical professionals. Emulating the language of a trained physician, the lay author reports ages, genders, patient histories, and chief complaints. As the narrator moves from example to example, these details, taken together, begin to resemble a case series—the medical genre that collects multiple patient histories in order to establish a pattern. The choice of "uveitis," the scientific term for eye infection (from the Medieval Latin word for "grape," *uva*, and the Greek suffix *-itis* indicating inflammation), is particularly noteworthy; it is unusual in lay conversations, a specialist word normally confined to the medical community, but used here deliberately as a rhetorical signal.

As literary scholars working in the digital and medical humanities, we read the signal clearly: the online poster's formal narrative mimicry and adoption of technical diagnostic labels point to

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an appropriation of authority. By alluding to established forms of medico-scientific discourse, the poster wrests authority from scholarly registers of expertise, while establishing a different register of folk credibility. In the clinic, patients often resort to such register-switching in their encounters with healthcare professionals in order to sound reliable and be taken seriously.[1] In the pseudonymous world of online communities, these same structural and stylistic features help to establish an individual poster's authority in the eyes of readers and community members, who are meant to recognize those features by analogy to expert ways of discussing health.

Scholars have highlighted the narrative structure of medical knowledge—both its formulation and transmission—and, in particular, the structural analogies of the case report with detective stories.[2] The tie between credibility and the ability to pass discursive checks has been also amply studied since Michel Foucault's examination of language, power, and the adjudication of health and illness. In this study—which uses narrative analysis as its principal method—we highlight other, related yet distinct modes of asserting authority when discussing matters of health and illness in the context of vaccine hesitancy.[3] In particular, the register of folk credibility plays an essential role in how online posters disseminate vaccine-hesitant beliefs. The empirical analysis of the folk language of vaccine hesitancy has been so far a salient omission in science and technology studies and in medical humanities scholarship alike.[4]

Even as online posters allude to the conventions of medical reporting and at times resort to highly technical medical vocabulary, their stories also highlight the experience lived, whether directly or vicariously: they document not only *my story* but also the story of my mother, my uncle, my father—whereby family ties establish narrative trust through the testimony of a first-hand witness. The suffering thus documented cannot be doubted, though the conclusions are open to interpretation. In the midst of borrowed medical terms, online posts in vaccine-hesitant communities are also full of homespun interjections, self-effacing contradictions, and various small affirmations addressed to a like-minded audience. Comprehensively, our online vaccine story-tellers evidence authority from the top down—in imitation of medicine—and credibility from the bottom up, in the register of folklore.[5]

In what follows, we will attempt to capture the narrative dynamics of what we call *folk skepticism* between these two polarities—lay and professional, folksy and scientific—so that we may better understand how ordinary people think and make decisions about health, particularly in the context of vaccination.[6] Through shared discursive practices, ordinary people shape one another's beliefs and build counter-narratives that emerge as alternatives to public health guidelines—counter-narratives that, in the end, sometimes come to be seen as equally or more valid than evidence-based science.

[1] Booth, *Rhetoric*, 158–159: "I have called a narrator *reliable* when he speaks for or acts in accordance with the norms of the work (which is to say, the implied author's norms)."

[2] See, for instance, Hunter, *Doctors' Stories*; Laqueur, *Work of the Dead*; Rapezzi, "From Sherlock Holmes."

[3] This study builds upon the work of other studies that have used narrative approaches to vaccine hesitancy, including (for instance) Heller, *The Vaccine Narrative*; Hausman, *Anti/Vax*; Goldenberg, *Vaccine Hesitancy*.

[4] One important exception to this omission is the work of Kitta (*The Kiss of Death*; *Vaccinations and Public Concern*; and, with Fivecoate, *Whispers in the Echo Chamber*), which offers an essential precedent to this study's analysis of the folkloric elements of vaccine hesitancy and conspiracy thinking.

[5] According to William Labov's analysis of personal narrative in folklore, the first-person "experience narrative" necessitates "credibility" as a fundamental requirement (in direct and inverse proportion to "reportability"). The experience narrative depends on a more general form of credibility than, for instance, the "belief narrative," which is its own distinct form. In what follows, we use the term "credibility" to refer to that necessary quality characteristic of the experience narrative. Labov, *Language*, 21–22.

[6] Some historical studies that contextualize how folk skepticism has developed in America into the form discussed in this paper include Conis, *Vaccine Nation*; Colgrove, *State of Immunity*; Mnookin, *Panic Virus.*

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2 History and Context: Folk Credibility, Folk Skepticism

Folk belief has long played a part in the history of vaccination. Vaccines were invented at the intersection of lore and science, when in the eighteenth century Edward Jenner traversed the wilds of the English countryside, gathering tales told by dairymaids, gardeners, and servants whose exposure to cowpox had also made them immune to smallpox.[7] Today, self-reported tales of vaccination continue to occupy similar ambiguous grounds between scientific discourse and oral tradition. Yet they also form a part of a cohesive worldview—a living tradition subject to its own complex logic, style, and lexicon.[8] Folk skepticism, far from an anachronism, represents the stories ordinary people construct about their bodies as a narrative tool to conceptualize and parse their experiences of sickness and health, in an attempt to cope with the increasing complexity of modern medicine.

Elsewhere, our colleagues in sociology have described recent cultural changes toward conspiracy and skepticism as a "crisis of expertise," by which an overwhelmed public both requires and resents its reliance on domain experts in areas of human activity from plumbing to dentistry.[9] The rise of an "expert class," in our view, entails the corresponding proliferation of professional languages, spoken within professional communities as markers of distinction. Specialized jargons do not stay confined for long, however, in their original domains. The way of speaking professionally migrates into general conversation through acculturation, in the encounter with the medical system, and through the wide circulation of diagnostic genres.

If laypeople switch to a medical register in their interactions with healthcare professionals in order to sound reliable, in the anonymity of their online communities, they co-opt expert discourse in order to claim and, at the same time, to undermine the very authority such a medical register represents. Paradoxically, the incorporation of expert registers into ordinary language represents a patient's attempt to rectify a perceived imbalance of power between lay and professional decision-makers: online, the patient gets the last word. Concerns dismissed in the examination room find a voice online—on social media and community forums—where the usual scripted encounter between a patient and physician may be retold and reconceptualized.

Folk skepticism thrives in times of apparent epistemic uncertainty, when medical science is perceived not to provide clear etiologies, absent an obvious connection between disease and its causes.[10] Such is the case for conditions that are not well understood by science, including chronic pain, Lyme disease, Long COVID, and any perceived "vaccine injury." Mythologies of all sorts—conspiracy theories, alternative medicines, misinformation, and propaganda—prosper during times of crisis, influencing decisions about health, wellbeing, fitness, family planning, and diet, among other aspects of shared human physiology. For these reasons, contemporary health mythologies should hold immediate interest for researchers, medical professionals, policy makers, and public health officials engaged in community outreach—and especially those working to increase vaccination coverage. Our understanding of how vaccine hesitancy is communicated among people, we argue, must be guided by empirical narrative analysis—not by preconceived notions, or worse yet,

[7] Wang, *Smallpox Report*, 14.

[8] See, for instance, Good, *Medicine, Rationality, and Experience*, or the following passage in Clement, "Samoan Folk Knowledge," 194: "Folk representations, the means through which folk knowledge is expressed, are, in a sense, products of the institutionalized patterns of information processing and knowledge distribution within the group."

[9] For foundational discussion of this phenomenon, see Willard, "Authority" and (later) *Liberalism*, especially at 179; for a more contemporary formulation, see Eyal, *Crisis*, 3–4: "Amidst handwringing about declining trust in experts, disregard of scientific evidence and dismissal of expert opinion, we may need to recite the obvious: that there has never been a society more reliant on expertise than our own; that experts were never more numerous and more indispensable than in our own"post-industrial," computerized, medicalized society; that scientific evidence and methods were never more integrated into the very fabric of politics [...] What needs to be explained is not a one-sided 'death of expertise,' 'mistrust of experts,' or 'assault on science,' but the two-headed *pushmi-pullyu* of unprecedented reliance on science and expertise coupled with increasing suspicion, skepticism, and dismissal of scientific findings, expert opinion, or even of whole branches of investigation."

[10] See, for instance, Boudry et al., "Weird Beliefs."

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superstitions about superstitions.

Consequently, we aim here to establish a framework for understanding modern vaccine hesitancy as a hybrid discursive style in the guise of folk skepticism—a style of communicating and reasoning about health which combines the formal properties of medicine and folklore in unexpected ways. To this end, we must first ask: Given the narrative and rhetorical components that lie at the core of the formulation and transmission of medical knowledge, how do patients (and their friends and family) establish credibility when sharing their stories online?[11] In light of folk skepticism so understood, we propose several tentative strategies for improving public health outreach, bridging the gap between medical and lay systems of representations of illness and health.

Our contribution to the study of language as a "tool for health behavior change" lies in the understanding of health communication as a discursive style, comprising distinct vocabularies, rhetorical strategies, and narratives.[12] More than mere affect, a discursive style signals a common worldview containing a cohesive system of beliefs. Experts, for instance, may highlight ideological affinity with other experts by using a shared register of technical jargon. Their common vocabulary points beyond language to practice, affirming extra-linguistic, social commonalities in professional rites and standards. An expert may recognize a colleague when "talking shop" at a cocktail party by sharing rhetorical tropes common to the field, yet rare in everyday conversation.

Furthermore, a shared discursive style indicates the commonality of implicit explanatory paradigms. In addition to "talking the talk," one expects fellow experts to reason in a manner consistent with the expert community. An epidemiologist, for instance, is trained to marshal evidence in particular ways, while rejecting other types of evidence considered substandard in the profession. Where an elderly family member may say casually, "close the window, you'll catch a cold," a medical expert would insist that "viral infections" like the common cold are transmitted by oral droplets. Their utterances not only operate in different registers (casual and formal) but also suggest diverging courses of action: One leads to warm shawls and the other to frequent handwashing. One advises to avoid cold drafts, and the other, crowds.

In each case, the surface utterance represents an underlying worldview, where causes and effects stand in some previously settled relationship, for example—between drafty windows and runny noses, or germs and soap. Therefore, calls to "close windows" or "wash hands" also foster a sense of belonging to an epistemic community.[13] It is no surprise that compliance itself then becomes a relative concept.[14] The acuity with which the public argues seemingly innocuous health mandates belies an investment in the belief system as a whole. A "wrong" prescription isn't just perceived to be misguided—it undermines evidentiary epistemic standards. The act of leaving one's windows open or one's children unvaccinated therefore defies not just the letter, but the spirit of the mandate. Such acts signal the wholesale refusal of the expertise paradigm in favor of the homespun.

The style of communication on either side signals a path to epistemic consensus. The choice to comply with a mandate implies broader "agreement to agree" in specific ways: Where grandma's advice evokes familial wisdom, a physician's is sanctioned by the medical establishment. Consen-

[11] See, for instance, Belling, "Begin with a Text," Charon, *Principles and Practices*; Frank, *Wounded Storyteller*; Fratto, *Medical Storyworlds*; Hegele, *Romantic Autopsy.*

[12] See, for instance, Hinyard and Kreuter, "Using Narrative Communication."

[13] Bennett, *Alas, Poor Ghost!*, 139: "The women who told the memorates [sic] I have discussed were not literary artists or professional tellers of tales. Nevertheless, they were effective storytellers. They not only communicated their experiences graphically, but they structured them so they could be used as 'discussion documents' to negotiate worldview and philosophy. […] The narratives grew out of experience, and the context of their telling was the discussion of tradition, experience, and belief."

[14] Medical anthropologists have explored the variety of meanings and forms that the concept of compliance acquires in different class and ethnic subgroups in the US population; most notably, when we witness a paradigm clash between medical expectations and traditional, non-Western, or folk beliefs that arise from conflicting explanatory models in the care of the ill. See, for instance, Kleinman, *Illness Narratives*, ch. 7.

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sus happens by peer review in science, by majority vote in politics, by seniority within a family, and so on. Following the prescription of one community over another, we indicate our tacit belonging to that community, our trust and belief in its shared values. Therefore, when someone agrees to follow a mandate, to wear a mask for example, they usually do so based on trust, absent first-hand evidence for its efficacy. As nominal members of a scientific community, they simply trust that efficacy was established appropriately in accordance with scientific standards. In indicating my preference for mask-wearing, I therefore also imply numerous concomitant assumptions about the epistemic field as a whole. Opinions to the contrary alarm not because of minor disagreement, but because they signal deep divergence in our ways of knowing.

Discourse signals belonging. Therein lies another aspect of the contemporary "crisis of expertise": Expertise professed doesn't always match expertise earned. Though it may quack like a duck, it might be a fake duck. And it would take an expert to validate expert claims. Each expert in our own specialized domains, we rarely have time nor resources to verify expertise in others. Under the conditions of epistemic asymmetry, lay publics must rely on the outward markers of expertise alone—the classic appeal to authority. Grift and deceit thrive within the chorus of expertise signaled superficially, on the imbalance of information. Non-experts can and do mimic expertise to accrue cultural capital in bad faith, often lacking any meaningful commitment to the underlying worldview. The ready circulation of expert discourses in modern media allows lay people to participate in language games previously reserved for closed, professional groups.[15] Witness the freehand use of words such as "osteoarthritis," "pathology," "uveitis," and "case" in the vaccine-hesitant post cited at the beginning of this article. The value of outward expert tokens—argot or uniform—diminishes in proportion to their accessibility. When the public makes salad out of medical terms, expert opinion also begins to sound like word salad.

The perceived "flattening" of the expert space ultimately places sundry modes of expertise into direct contact, highlighting a diversity of possible worldviews on any given topic: A decision about immunization can be discussed one way between epidemiologists, another way by public health officials, another way by legislators, and yet another register among friends and family. One and the same person may even "switch codes" to express contradictory opinions while playing different social roles or "wearing different hats."[16]

In this way, a physician could demand one standard of evidence from a colleague in print, while relaxing those requirements domestically, by another standard, when treating one's own child, in the role of a parent. Such divergent language games cannot always be reconciled to a single, cohesive sense of truth or reality, because the worldviews they represent—political, religious, scientific or otherwise—do not themselves converge neatly around a unified point of view.

3 Scope and Methodology: Folk Skepticism Online

How can researchers access the conflicting worldviews implicit in the public's conception of health and illness?[17]

[15] See, for instance, Bloor, "Language-Games," 22.

[16] See, for instance, Ayuuf and Majeed, "Sociolinguistic Analysis"; Pahta, "Code-Switching"; Cohen, "Beliefs and Rôles."

[17] See Good, "Heart," 25: "[W]e use an analysis of 'semantic networks' to understand the meaning of medical language as it is used in various communicative contexts. The meaning of a disease category cannot be understood simply as a set of defining symptoms. It is rather a 'syndrome' of typical experiences, a set of words, experiences, and feelings which typically 'run together' for the members of a society. Such a syndrome is not merely a reflection of symptoms linked with each other in natural reality, but a set of experiences associated through networks of meaning and social interaction in a society. This conception of medical semantics directs our attention to the use of medical discourse to articulate the experience of distinctive patterns of social stress, to the use of illness language to negotiate relief for the sufferer, and thus to the constitution of the meaning of medical language in its use in a variety of communicative contexts." Note that this paradigm has been proposed, but it has been carried out so far in small samples, not enough to build representative networks, embeddings, or lexicons.

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Our initial remarks on the structures of folk skepticism online entail a corresponding methodology for textual and discursive analysis, to which we bring the tools of linguistic and literary scholarship. Our tools include lexicology (the study of vocabularies used), stylistics (the study of literary tropes, figures, and techniques), and narratology (the study of story structures), among other historically- and culturally-aware methods for qualitative and quantitative analysis.

We first observed the curious rhetorical structures of folk skepticism when we sampled brief excerpts from a vast corpus of data related to vaccine hesitancy that our lab had collected between 2020 and 2024 (including both posts written during the Covid pandemic and earlier samples dating back as far as 1996, in the case of the Mothering.com forum). Millions of examples of vaccine-hesitant language were drawn from online communities where vaccine hesitancy (a delay or refusal of vaccination despite its availability) was discussed in an unmediated, informal way. After passively observing such forums for one year, our lab compiled a corpus of conversations about vaccines by sampling posts related to the keyword "vaccine" from major social media platforms, including Facebook (Meta), Twitter (X), YouTube, and Reddit, as well from "alt-tech" platforms such as Parler, Telegram, and Truth Social. We also examined posts shared in focused online communities organized around topics, themes, and lifestyle questions (e.g. parenting, religion).

In this paper, the examples that we read and analyze are drawn from one such specialized community: an online forum, Mothering.com, centered around the experience of motherhood, with focus topics on "nurturing, health, and behavior." The forum has hosted active membership for almost thirty years and includes 285,000 members. Since inception in 1996, over 16.5 million total messages have been exchanged on the platform. Community members discuss topics from pregnancy and babyhood to the teen years and beyond, with attention to subtopics like discipline, babywearing, homeschooling, and travel with children. Vaccination remains a popular topic of discussion. A recent visit to the forum, for example, yielded a new "top" post, titled "Catching my 18 year old up on vaccines." As part of our efforts in digital ethnography, the lab sampled 401,605 messages related to vaccination from this forum, in preparation for large-scale, quantitative computational analysis.

The study of this and similar discursive communities online provides a rare glimpse into views ordinary people hold and share about health. Unlike traditional interviews and reports obtained in laboratory conditions or by survey, the views compiled in our study were expressed spontaneously, from peer to peer, in an appropriate social context. Collecting such "organic" reports after the fact minimizes the impact of observation, decreasing response bias due to demand characteristics, social desirability, concerns with privacy, shame, or other confounding factors.

Despite these strengths, digital ethnography online poses its own set of challenges to research, unique to the online world. The many biases of corpus analysis online are worthy of attentive consideration, since focused attention to specific platforms will capture only the concerns of those communities. For example, we know that the compiled views represent a subset of the population specifically willing to engage online. By inference, that public is literate, opinionated, and plugged-in. The choice of site selects for people likely to participate in writing, eager to share or to argue, those with time and technical ability to connect to the internet. Conversely, online conversation may disfavor the elderly, the illiterate, or those without a reliable internet connection.

Furthermore, the affordances of specific online platforms—such as YouTube, Telegram, or Facebook—may constrain shared rhetorical possibilities in scope, length, or subject-matter.[18] On-

[18] The linguistic affordances of online communities constitute *culture*, according to Ward Goodenough's anthropological definition of culture in Goodenough, "Cultural Anthropology," 167: "culture was like a language, which is not what its speakers say but what they need to know to communicate acceptably with one another, including constructing utterances never made before yet immediately intelligible to others." Culture consists of what community members "must know in order to act as they do, make the things they make, and interpret their experience in the distinctive way they do." See also Goodenough, "In Pursuit," 7. Each online community has its distinctive *cultural ecology:* "cultural behavior is attained by a formulation of what one must know in order to respond in a culturally appropriate manner in a given

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line content is moderated. On social media, it is subject to specific community guidelines, enforced through various passive and active methods of censorship, depending on the platform. Platforms shape conversations online in more subtle ways, as well: Some encourage mixed media, while others privilege visual or audio content. Textual commentary isn't always encouraged. Social capital is gamified in some communities, where more active "insiders" wield most influence. Some channels encourage posting and reposting, among flat social network structures. Other social messaging channels can be configured for top-down, one-way communication, by the way of newsletters or announcements. Various forms of gamification—likes, shares, and dislikes—shape engagement. To complicate matters, various forms of machine output—generated by advertisers, political campaigns, or state actors—mimic human conversation, often in bad faith. The views contained in our samples, while "organic" and representative, must also be seen through the prism of social media. They cannot be extrapolated lightly to the general population.

Given these considerations, rather than only engaging our data in aggregate, in what follows, we turn our focus to the individual by closely analyzing a single vaccine-hesitant sample from our dataset. Through a close reading and comparative analysis of several hundred such samples of text, our team selected this post as it appeared narratively and semantically rich while also representative of broader trends in language and logic, figuration and motif, and formal consistency that recurred throughout our corpus. Using the tools of linguistics and literary scholarship, we examine how the author of the text, an anonymous online poster, deploys competing discourses of scientific authority and folk credibility in their production of vaccine-hesitant folk skepticism.

Folk skepticism—as we conceptualize the term as a concept of linguistics—identifies an emerging modality of everyday conceptualization, which blends the registers of professional expertise with extant lay traditions.[19] A verbal register, in this case, encapsulates both (a) specific lexicons—the choice of words and concepts used or excluded; alongside (b) established rhetorical styles, recognizable by their formal features, such as tropes, evidentiary strategies, citation patterns, or narrative devices.[20] A "family semblance" of such registers signals adherence to an implied epistemic standard.[21] The register of scholarly communication, for example, will rarely contain vulgar speech. Genres of academic writing are transmitted through the university, where students learn to replicate certain ways of speaking and writing, deemed appropriate to scholarship. When encountering new information, a trained eye will readily recognize several such familial features in moments of epistemic evaluation.

Unlike scholarly communication however, folk belief circulates informally, lacking instruments of codified transmission such as textbooks, syllabi, rulebooks, courses, or style guides. The famous legal dictum about pornography—You know it when you see it!—illustrates the difficulty of describing any such register with precision. Yet, since people do readily recognize differences between folk belief and scholarship, we can be certain that their lexical features persist, enough so to be condemned or condoned among various communities of practice.[22]

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socio-ecological context." See Frake, "Cultural Anthropology," 54.

[19] Geoffrey M. White calls for a cross-cultural investigation of illness as both a system of classification and of commonsense thinking. As an "intrusive disruption of body, persona and community which requires explanation and corrective action," illness necessitates "some form of folk theory as a basis for interpreting or 'making sense' of that experience". See White, "The Ethnographic Study," 69.

[20] Our study of the semantic features of the folk healing discourses of laypeople—compared to dialects spoken by the institutions of biomedicine—is indebted to the work of Horacio Fabrega Jr. and Daniel B. Silver, *Illness and Shamanistic Curing*, who conducted an ethnomedical analysis of Zincanteno and biomedical disease categories as differing systems for mapping symptoms onto the names of diseases.

[21] Bloor, "Language-Games," 36.

[22] We draw here on Sturtevant's definition of *culture*, in Sturtevant, "Studies in Ethnoscience," 123–124, as intersecting folk knowledge and science: "the sum of a given society's folk classifications, all of that society's ethnoscience, its particular ways of classifying its material and social universe."

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4 Case Study: Mothering and Measles

With these competing verbal registers of expertise in mind, how can we understand the style particular to folk skepticism generally, in the context of vaccine expertise specifically? Consider the following anonymous self-report, shared on a public forum and transcribed here verbatim, with minor emendations for privacy:

> Thank you, [REDACTED] and [REDACTED] for your concern... Yes, we are positive that his heart troubles are due to measles. First of all, this is a well-know, althought rare complication of measels. If you would just google +measles +myocarditis many sites would pop out. Second, in the circles we now frequent (cardiologists, hospitals, etc...) there are other children just like him. Most importantly, he had an extensive heart biopsy when his heart trouble started, and plenty of measels viruses and even more measels antibodies were discovered -- so yes, it could only be measles. About my son and his disease: he was born healty and remained healthy right until the measles, at the age of 2 and a half. He had a single episode of flu and a (very mild) patch of eczema. He had NO VACCINATIONS. We live in a clean suburb, in the US. We eat healthy, not so much organic but unprocessed. My motto is -- ifr it is not made from scratch we will not eat it.. We are quite crunchy. I breastfed him exclusively for 9 month, and partially for about an year more -- and I actually have had the measels, so that I probably passed some immunity to him. I desided not to vaccinate him and his sister because I was (stilll am) afraid of vaccines and I believed that our lifestyle will protect them. It did not and I cannot help but wonder whether I would make a different desision IF I were also aware of the danger of the diseases. My daughter was the first one to come down with measles, and we were not sure just where she picked it up. He followed her, and had an easier time with it. She had a bad cought, eye irritation, fatigue, high fever. He only had the fever and the skin rash. After about a week or so, his fever went down. He seemed fine and I patted myself on the shoulder for my great disision. By the way, neither of the children recieved any major treatment for the disease, and this is more or less the standard protocol for viral illnesses, such as measles. We went to the doctor (in the evening, after the office hours were over),the doctor took one look at them, declared it to be measels, told me to give them plenty of vitamins, put saline drops in my daughter eyes, and not to go too crazy with fever medications. I also gave them some homeopathic medications I got from a family friend, good and trusted doctor. The acute illness was gone, but he did not seem to function or feel any better. In fact he acted and looked as a cancer patient on chemotherapy: he was pale, fatigued, sleepy, without any appetite, crabby. He ran low fevers. He would tire off easily. He seemed to be out of breath after any extertion. I first thought that something must be wrong when he fearfully declined his sister's offer to jump on the sofa -- can you even imagine such behaivior from a toddler boy!!! I called our doctor and made an appointment for Monday afternoon (it was on Sunday morning). He seemed quite calm, told me it sounds like pneumonia, asked me to do an Xray and a blood test on Monday morning before the appointment. He was somewhat concerned with the fever being low. We never made it to the appointment because by Monday afternoon my son was being transfered form one hospital to another. I need to go now, but I promise to finish later this evening. The bottom line is that both diseases and vaccinations have complications, and I beg you to consider this before making any desisions. Please do not rely exclusively on anti-vaccine sites -- they ommit or misrepresent some of the information. I used to believe that i could insurre good health with ”correct lifestyle”, but discovered that good food, breastfeeding, no antibiotics, etc. give no gurrantees.

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Please make your desisions carefully and take care.

In summary, the narrator reports her own and her son's experience with a case of measles, following her decision not to vaccinate her children against measles. The story is told from the perspective of a health-conscientious "crunchy" (here used as a synecdoche in reference to granola, which in turn is associated with hiking, the outdoors, and natural living more generally) mother who lives in "clean suburbs," cooks organic meals, and prefers traditional healing practices to modern medicine.

The post holds initial interest because the author displays a nuanced form of skepticism, directed at once both at the medical establishment and at the natural-lifestyle worldview that she shares with her online audience. Note the immediacy of the voice (down to the lack of spelling correction), the familiarity with medical terminology (myocarditis, biopsy, eczema), the precision of setting (the appointment was on Monday afternoon), and the immediacy of domestic observation (her son "fearfully declined his sister's offer to jump on the sofa").

On further reading, note how carefully the author constructs her account: first, by connecting with her readers; next, by setting the scene to establish credibility; further, by recounting several vivid moments of witness testimony; and finally, in doubt, subtly undermining the entire narrative. Though each of these rhetorical devices—establishing connection, setting, witness, and doubt—may be present to a different degree in any given post, all four will comprise the characteristic anatomy of a folk-skeptical self-report. Repeated sampling of our corpus of vaccine-hesitant posts suggests that such a structure emerges with remarkable regularity. Let's examine each of its elements in turn.

The post opens by thanking two members of the community for their concern; this gesture establishes or reiterates a connection among people who belong to the same group. Immediately following, we encounter a succinct account of facts. Similar to the genres of folklore and urban legend, folk-skeptical accounts "set the scene" by orienting narrative toward witnessed persons, places, times, and behaviors. Such settings, in the paradigmatic account set out by the folklorists Linda Dégh and Andrew Vázsonyi, contain "the circumstances of telling, the introductory remarks of the teller, interjected comments, and reflections of both teller and participants that parallel the performance to the end."[23] Legends come pre-packaged with stories of their own credulity, we learn. Implicitly or explicitly, and "almost without exception," the legend insists "that its message is or was believed sometime, by someone, somewhere: 'by the neighbor,' 'by an old woman,' 'by grandfather,' 'by somebody,' 'by people somewhere else,' 'a long time ago.' "[24] Similarly, the tales of vaccine hesitancy we have collected frame their beliefs as a consequence of witnessing made more credible in the proximity to the teller. The purpose of setting the scene lies in the subjective establishing of a narrator's witness for the audience, in anticipation of the coming story.

In the example above, the narrating mother sets the scene as part of an ongoing public conversation among friends, where participants are thanked and acknowledged. The report opens with multiple moments of epistemic consensus building: where the previous message suggested an alternative explanation of the child's symptoms, our author has "done her own research" by Googling the terms, which confirm the link between measles and myocarditis. She suggests her collocutors do the same. This methodology appears sound because it is, in epistemological terms, falsifiable, that is, it is prone to be falsified by a quick Google search that any reader can do. In addition, the mother also "frequents medical circles," where her conclusions are affirmed directly by the presence of other, similar cases. Finally, the heart biopsy establishes the link conclusively, by empirical methods.

The circumstances of telling are framed in a nested fashion within explanatory paradigms: online, medical, and personal, with the personal and medical at one point merging with the in-

[23] Dégh and Vázsonyi, "Legend and Belief" (1981), 101.
[24] Dégh and Vázsonyi, "Legend and Belief" (1981), 119.

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troduction of a family friend, a trusted doctor. The personal connection and proximity (family friend) comes first in syntax and in moral hierarchy compared to the fact that the person is a physician. Ultimately, authority rests on the credibility of the narrator as a mother, within the family, in plural: The account concerns *"my* son and his disease." But also,* we* are crunchy, *we* live in clean suburbs. The children were breastfed*—"I* believed that *our* lifestyle will protect them." Henceforward, the witness of mother and family cannot be doubted on evidentiary grounds.

Once this subjective frame is established along with external evidence, the narrative proceeds in witness, providing an irrefutable wealth of first-hand observations. More than the sum of its facts, witnessing exceeds evidentiary potential. In the Christian tradition especially, a witness finds credibility by being a person of moral character, an embodied member of a community. Elaine Scarry writes of the New Testament that "the human body substantiates the existence of God […] The centrality of this act of witnessing cannot be overstated. It is there not primarily to assure the distant reader that the story is true, that it happened; rather, the story is itself the story of the permission to witness, the story of the sentient body of God being seen and touched by the sentient body of man."[25] We add: To witness suffering elevates witnesses into believers, who share in communion (that is, communal suffering).[26] The witness finds credibility in being a good person, but is also transformed into a good person by witnessing the body in pain.

These somewhat heady, distinctly Christian affordances of witness operate similarly at lower registers of folk belief. Absent sanctification, a mother's witness to the suffering of her child gains credibility by the measure of its attention to detail. "Personal experience forms the basis of the believer's case," Gillian Bennett writes about traditional belief. "For the majority of people, 'good evidence' of the truth of traditional concepts is empirical and oral. For them, the best evidence of all is personal experience, and then, in descending order of merit: the eye-witness accounts of peers; the reports of 'sensible' people; media reports; and [last of all] written accounts."[27]

Call it "personal experience" then, and "good evidence" by which a parent perceives the signs of trouble well before the physician. Where the doctor "took one look" to diagnose, the mother observed her son continually, over time and in context, to find him "pale, fatigued, sleepy, without any appetite, crabby." Where medical professionals gathered evidence invasively (by ordering a heart biopsy to confirm diagnosis), the mother saw sickness in her son's refusal to jump on the couch. The details a stranger might miss matter, because they reveal a complete picture of the child's health. The acuity of witness speaks to credibility, forming the basis of the case. It was measles after all, confirmed not merely in the biopsy nor by the Internet, but because the witness saw the wounds (perhaps just a rash) with her own eyes.

Relatable, credible, irrefutable. Still, the story refuses a neat verdict. Within legend and folk belief, Dégh and Vázsonyi explain, "the closing remarks, explanatory, supplementary or contrasting stories, analogous cases, and modifications or straight refutation of the story in question are also inseparable parts of the legend."[28] Folk skeptical accounts typically culminate in a moment of doubt. "It often happens that the teller and his audience will open or close the telling of a legend with an inconclusive discussion of its truth. One might say the question of belief-nonbelief is an active problem in any community where legends are told."[29] Our narrator, too, interjects and undercuts her account throughout. "He had NO VACCINATIONS," she states initially, but by the end of the post, she arrives at an unexpected conclusion: "please do not rely exclusively on anti-vaccine sites."

The arc of the story finally bends away from certainty. Between the call to the doctor on Sunday morning and the hospital transfers on Monday—the period of the child's most extreme suffering,

[25] Scarry, *Body in Pain*, 212.
[26] See Chrétien, "Nine Propositions."
[27] Bennett, *Traditions of Belief*, 89.
[28] Dégh and Vázsonyi, "Legend and Belief" (1971), 287.
[29] Dégh and Vázsonyi, "Legend and Belief" (1981), 109.

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which ought to have been the climax of the narrative—events are missing. We don't know how the child is doing now, nor how serious his complications have become. Narrative gaps leave the worst unsaid. The journey recounted here wasn't ultimately the child's, but the mother's. "I used to believe that i could insurre good health with 'correct lifestyle,'" she writes, "but discovered that good food, breastfeeding, no antibiotics, etc. give no gurrantees. Please make your desisions carefully and take care."

The oddity of this and similar accounts lies in the tension created between the constituent devices—connection, setting, witness, and doubt—simultaneously in the mode of folklore and scientific skepticism. Where lore joins a chorus, skepticism halts in dissent. Here, objectivity can be challenged in favor of the subjective. "I am one of you," the post means to say, but also "I am the one who doubts you." A community of skeptics is united by their capacity to stand apart from the collective.

Mom's story therefore ends not in affirmation but in apostasy. The narrator renounces both the medical establishment and natural healing. The "correct" lifestyle—that is, lifestyle lived according to shared belief—appears suspect alongside modern medicine. Conclusions are tentative, voiced in the negative, doubting and indecisive: "I was (stilll am) afraid of vaccines… I cannot help but wonder whether I would make a different desision." Credibility ultimately resides in personal experience unavailable to the community.

In their theory of legend and folk belief, Dégh & Vázsonyi describe an analogous dynamic:

> The actual belief manifest at the time of the telling is always the result of the dichotomous relationship between the communal belief system, inherited in tradition and sanctioned by enculturation, and the personal belief of the individual performers. The shared knowledge of the network of belief makes its presence felt in an overt or covert form in all phases of legend communication.[30]

In the case of online folk skepticism, that "dichotomous relationship" between the communal and personal strains under tension. Lore, manifest within shared knowledge, binds the folk. Skepticism demurs to the contrary. Doubt thus both concludes and precedes witness testimony, permeating the sense of folk skepticism throughout. Skepticism, in the end, is the prerequisite for joining as well as the reason for leaving the community.

5 Counterpoint: The Structured Nature of Medical Expertise

One curious quality observable both in this example and across many online folk-skeptical narratives is their insistence in drawing on expert vocabularies. Folk-skeptical writers regularly perform expertise through expert rhetoric—borrowed, in the case of vaccine hesitancy, from medicine. This borrowing raises questions, in turn, about the nature of the expert register and its relationship with folklore. Within its own domain, how is medical expertise established? Which features of expertise do folk-skeptical writers repurpose? And how might the folk-skeptical narrative expose medical expertise as a similar verbal construction?

While for reasons of scope we do not propose solving all these problems here, we will, however, offer a short structural analysis of the medical case history as a counterpoint to our longer anatomy of a post to show how it diverges. Read alongside the folk-skeptical narrative, the medical case history proves not to be as natural or transparent a genre as it might at first seem.

Medicine and literary studies alike have recognized that narratives of medical expertise follow predictable trajectories. Whether an example of "Clinical Problem Solving" in the *New England Journal of Medicine*, a "Case Report" in *The Lancet*, or a "Clinical Care Conundrum" in the *Journal of Hospital Medicine* (among many more), medical case histories invariably begin in a position of

[30] Dégh and Vázsonyi, "Legend and Belief" (1981), 103.

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epistemic uncertainty. A patient presents with symptoms of unknown etiology. A diagnostic chain connects symptoms both to antecedent causes and to subsequent treatment. The case make its way through the medical system in myriad textual forms: digital notes, charts, briefings, billing codes. Each is a story told and retold by health professionals, who reassemble and refine the plot in a way that leads to one of several possible formulaic outcomes: Lost health regained after a journey. A medical mystery solved. Heroes save lives. A life lost to illness leads to tragedy. But while the endings may differ, ultimately, all medical cases histories are driven by a common teleology that forecloses doubt and makes a diagnosis.

There is a compelling empirical reason for the predictability of this sequence. The case report is designed narratologically to "simulate step-by-step emergence of information/developments in clinical practice," describing how clinicians "reason and respond." Formally mimicking diagnostics itself, the report teaches readers (in the words of Joseph Bell, the surgeon who inspired Arthur Conan Doyle's Sherlock Holmes) "how to recognize accurately the case" through "the accurate and rapid appreciation of small points."[31]

Above, we have described the "Mothering and Measles" case as structured by four elements from folklore: connection, setting, witness, and doubt. It is curious, then, to observe how these qualities mirror (in a distorted, funhouse way) the four-part paradigmatic structure of the case history—at least, as it is described by *The Lancet* in its guidelines for writers.

The first component of the case history, per *The Lancet*, is its anecdotal quality: "Clinicians learn from anecdotes—stories they heard at medical school, stories they tell each other, and stories their patients tell them. This is an efficient way to grasp new knowledge—even the most obscure hints and warnings can be made memorable if tagged to real people and actual events."[32] Within a medical community, "anecdote" establishes the first folkloric quality: *connection.*

The Lancet's paradigmatic case history moves next into "presentation."[33] The patient appears to the narrating physician's view with unexplained symptoms, grounded contextually in the details of their history, and recent events that may influence diagnosis. This stage corresponds to the second folkloric quality: *setting.*

Next, the medical narrator intervenes through an exploratory performance of differential diagnosis in which various possibilities are suggested and abandoned. Prospective *Lancet* authors are advised to recount their methods and thought process. The medical expert (who may never have seen the patient firsthand) asks for objective evidence to support or refute their hypotheses: lab tests, radiology, physical examination, pathology slides.[34] As they consider the alternatives, the narrative is fraught with false turns and dead ends—but the detours are in service of the diagnostic destination. As the empirical observations, testing, and data accrue, this sequence, in the end, establishes the third folkloric quality: *witness.*

Lastly, the paradigmatic case history concludes with a diagnosis—a named condition ruling out the possibilities that don't fit the facts. Naming the diagnosis is directed at two audiences. For the patient, the diagnosis affords hope, paving a way to treatment. For *Lancet* readers, the diagnosis enters this single case into the collective scientific record. Yet it is in diagnosis that the case history diverges from the folk-skeptical narrative: Diagnosis forecloses *doubt*.

Returning to the "Mothering and Measles" narrative and reading it anew through the paradigm of the case report, a narrative structure emerges in sharper relief. The mother establishes her connections to expertise: "the circles we now frequent (cardiologists, hospitals, etc.)." The presentation of the case is established in a list of pseudo-medical qualifiers ("a single episode of flu"; "a (very mild) patch of eczema"). When illness strikes the whole family, she embarks on a pro-

[31] Berman and Horton, "Case Reports," 1277.
[32] Bignall and Horton, "Learning from Stories," 1246; Kang, "Anecdotes in Medicine," 1448–49.
[33] Coles et al., "Case Reports," 1230.
[34] Coles et al., "Case Reports," 1230.

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cess of differential diagnosis, testing and rejecting explanations herself. Her verb choices become speculative: the boy *seemed* not to function better; he *seemed* to be out of breath. She (with her doctor's help) requests x-rays and blood tests, ruling out cancer and pneumonia.

Yet while the narrative mimics the case history—which as we've seen is *itself* structured with surprisingly folkloric elements—the "Mothering and Measles" story never arrives at the transformative conclusion that would be expected of a report in *The Lancet*. The author never names the cause of her boy's illness beyond "heart troubles." Doubt takes the place of diagnosis. For this folk-skeptical writer, the omission is strategic. "The bottom line" is not the validation of medicine, but instead the calling-into-doubt of expertise: trust no one, do your own research, make your decisions carefully.

What emerges from these exploratory readings is folk skepticism as a genre hybridizing folklore and expertise. This hybridity, we argue, is a hallmark of vaccine hesitancy. If it is easy to dismiss the folk-skeptical narrative as a rhetorical construct, it may be more difficult to recognize that the case history is likewise a product of patterns in language—patterns for establishing expert rigor that are easily repurposed to suit vaccine skeptics' ideological ends.

6 Conclusions

These four formal features of the modern folk skepticism that manifests in vaccine-hesitant online contexts—connection, setting, witness, and doubt—should be readily recognizable. A countervailing epistemology for many people who may feel left behind by modernity, folk belief has come to play an ever-growing role in North American discussions of health, science, and politics. Folk skepticism flourishes in response to expert opinion, whose authority grows suspect by the measure of its conviction. In contrast to experts, whose belief is impersonal, folk skeptics base their testimony on private experience. Folk skeptics speak to their peers on a level playing field, not from a superior position. Rather than offering authoritative conclusions, the folk skeptic doubts and hesitates in a show of epistemic vulnerability, which serves to reinforce their credibility as a witness.

For the field of health promotion, our structuralist analysis of the comparative styles of folkloric and medical expertise, which we anticipate to strengthen in the future using computational tools for quantitative analysis, may help improve how public health campaigns pitch their addresses to vaccine-hesitant members of the public. In research described elsewhere, our lab developed and tested pro-vaccination health messaging derived from structuralist analysis of online health beliefs. Early findings from our experiment-in-progress suggest that our Evidence Based Messaging strategy is more effective in engaging online audiences than traditional CDC pro-vaccine messages.

The early results of our ongoing study offer some practical—if still provisional—guidelines for providers. Physicians and public health officials, engaged in promoting scientifically valid, evidence-based messaging, may benefit by being attuned to the verbal registers and rhetorical styles of folk-skeptical laypeople. Sensitivity to word choice, narrative structure, and recurring tropes may help to promote effective communication on the levels of both individuals and populations. Appreciating the crucial importance of affiliation (family and friends) in health beliefs and decision-making may enable physicians and health officials to craft conversations and messaging strategies that include these collocutors. Affirming the witnessed experience of patients and laypeople creates bonds of trust. Acknowledging the radical doubt at the heart of knowledge levels the playing field. In the end, deliberately repurposing the empirically-observable narrative characteristics of folk worldviews about health, so as to gain the trust of folk skeptics and to promote confidence in science, may contribute to patient compliance and vaccine confidence, improving health outcomes for all.

Ultimately, folk skepticism online represents an immense and shadowy archive of the public's belief about health; it is tempting to dismiss the discourse as pseudoscience or ignorance.

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By approaching folk skepticism empirically, we can formulate more effective strategies of health promotion, based not on bias or stereotype, but on structuralist analysis and data. Idiosyncratic or information-heavy public health messaging strategies are not the most effective in achieving behavior change. Messages that engage with a person's worldview, echoing how they tell their own stories about health, are more persuasive.[35]

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[35] See Haase et al., "Source Credibility"; Hinyard and Kreuter, "Using Narrative Communication."

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