



# COGNITIO

Revista de Filosofia  
Centro de Estudos de Pragmatismo

São Paulo, v. 26, n. 1, p. 1-9, jan.-dez. 2025  
e-ISSN: 2316-5278

<https://doi.org/10.23925/2316-5278.2025v26i1:e73858>

## Beliefs by Contagion: the semiotic structure of viral content transmission on networks

*Crenças por contágio: a estrutura semiótica da transmissão de conteúdos virais nas redes*

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**Abstract:** The Peircean discussion on the modes of fixing belief remains relevant in the contemporary informational landscape, in which digital networks occupy a central role in the production and circulation of content. However, the criteria that once ensured the reliability of scientific beliefs—such as the continuity of experience, empirical testing, and community scrutiny—have been increasingly replaced by immediate social validation processes grounded in speed, repetition, and information virality. In this article, we analyze the phenomenon we call *belief transmission by contagion*, understood as an emerging mode of belief reproduction in environments mediated by digital platforms. To this end, we revisit the concept of belief in Peirce's pragmatism and situate it within the semiotic context of networks. We then describe the triadic structure underlying the dynamics of this contagion, articulated through the meme–network–belief relation: the meme as an iconic element, the network as an index, and belief as a symbol understood as a general rule of action. We demonstrate that this form of dissemination does not result from engagement with facts, but rather from the community and algorithmic dynamics that simulate scientific inquiry while undermining the formation of habits responsive to reality. Finally, we argue for the need to promote, in digital environments, modes of belief circulation that recover the cooperative and investigative principles of the scientific method, so that rationality may also become the object of a contagion oriented toward the growth of experience and the ideal of truth.

**Keywords:** Belief. Contagion. Memes. Networks. Semiotics.

**Resumo:** A discussão peirciana sobre os modos de fixar crença permanece atual diante do cenário informacional contemporâneo, no qual as redes digitais assumem lugar central na produção e circulação de conteúdos. Entretanto, os critérios que garantiam confiabilidade às crenças científicas, como a continuidade da experiência, o teste empírico e o escrutínio comunitário, vêm sendo substituídos por processos de validação social imediata baseados na velocidade, repetição e viralidade da informação. Neste artigo, analisamos o fenômeno que denominamos transmissão de crenças por contágio, entendido como um modo emergente de reprodução da crença em ambientes mediados por plataformas digitais. Para tanto, revisamos o conceito de crença no pragmatismo de Peirce e o situamos no contexto semiótico das redes. Em seguida, descrevemos a estrutura triádica que sustenta a dinâmica desse contágio, articulada na relação meme–rede–crença: o meme como elemento icônico, a rede como índice e a crença como símbolo enquanto lei geral de ação. Demonstramos que essa forma de disseminação não resulta do diálogo com os fatos, mas da capacidade de engajamento comunitário e algorítmico, configurando uma simulação da investigação científica que compromete a formação de hábitos responsivos à realidade. Por fim, defendemos a necessidade de promover, no ambiente digital, formas de circulação de crenças que recuperem os princípios cooperativos e investigativos do método científico, de modo que a racionalidade possa também se tornar objeto de um contágio orientado ao crescimento da experiência e ao ideal de verdade.

**Palavras-chave:** Crença. Contágio. Memes. Redes. Semiótica.

Recebido em: 08/03/2025.

Aprovado em: 25/06/2025.

Publicado em: 30/10/2025.



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## 1 Introduction

The modes of fixation of belief delineated by Charles Sanders Peirce are a classic part of his work. Although the philosopher's treatment of this topic was outlined as early as 1877, it dialogues expressively with themes developed in his maturity, especially his original approach to the modes of inference and his pragmatism. Proposed at the end of the nineteenth century, Peirce's account of beliefs remains strikingly relevant and raises important discussions within the contemporary informational labyrinth. However, the means through which beliefs are conveyed have undergone significant changes since the publication of *The Fixation of Belief*.

The problematic of belief in digital societies becomes central in a context in which the production and circulation of information have been democratized, yet without a corresponding democratization of the criteria for the validation of knowledge. The abundance of data, combined with the acceleration of communication flows and the disregard for epistemic authorities, creates an environment in which the fixation of belief no longer operates primarily through experimentation or rational inquiry. Instead, belief formation is increasingly anchored in processes of immediate social validation. The prestige of what is shared depends less on its adherence to reality and more on its capacity to mobilize affects, reinforce a sense of belonging, and gain algorithmic visibility.

This shift structurally alters the conditions under which beliefs are maintained and disseminated. What Peirce characterizes as "long run" appears to have been replaced by the immediacy and saturation of online content—forms of simulating reliability through repetition, speed, and virality. What is known is no longer what is proved, but what is propagated. Thus, we witness a displacement from reason to circulation, from argumentation to engagement, from inquiry to contagion.

Accordingly, the central problem examined in this paper may be expressed as follows: how have the communicational dynamics of digital networks altered the modes of fixation of belief, as described by Peirce, enabling dogmatic beliefs to spread and become stabilized without engaging in a clear dialogue with alterity and without consideration for the principle of long run?

In light of this, our aim is to examine a mechanism of belief conveyance linked to the massive dissemination of content through digital networks, which we call "transmission of belief by contagion." Owing to the quasi-involuntary acceptance involved and its capacity for extremely rapid and incalculably wide dissemination, we adopt the term "contagion," drawn from epidemiological discourse. This mode of transmission allows for the neglect of long-term considerations—what Peirce calls *long run*, essential to pragmatist inquiry—and grants reliability to beliefs through the velocity with which contents spread and the exacerbated number of receptive sources.

To pursue this aim, we will first address the concept of belief and its importance within Peirce's pragmatism, in order to then analyze the contemporary phenomenon of belief transmission by contagion. Following that, we will discuss the semiotic grounding of this phenomenon, characterized by the relation among meme, networks, and belief. Networks indicate how the qualities of a meme are interpreted from a specific repertoire. Under these conditions, the meme functions as the iconic element of a triadic relation in which the symbolic component is the belief as a general law of conduct, while the networks, by conditioning the possibilities of representation, function as index. Beliefs, or concepts, and memes, or ideas, are components of the same symbol; moreover, networks guide signification by instantiating general elements in individual experience.

## 2 What is a belief?

The question of belief is central to Peirce's pragmatism. The definition the author provides for this concept appears in different forms: either as a principle that ensures a disposition to act (CP 1.636; 5.12; 5.27; 5.370), as a habit (CP 2.148; 2.435; 3.160; 4.53), or as the adoption of a proposition as a *ktêma* es

*aei* (CP 1.635), that is, a durable or definitive acquisition. These definitions complement each other and allow us to understand belief as a model of conduct through which, given certain situations, one expects particular actions to succeed. In Peirce's words:

[...] [belief] has just three properties: First, it is something that we are aware of; second, it appeases the irritation of doubt; and, third, it involves the establishment in our nature of a rule of action, or, say for short, a *habit*. As it appeases the irritation of doubt, which is the motive for thinking, thought relaxes, and comes to rest for a moment when belief is reached. But, since belief is a rule for action, the application of which involves further doubt and further thought, at the same time that it is a stopping-place, it is also a new starting-place for thought. (CP 5.397).

To have a belief is, therefore, a form of intellectual rest, a calming of inferential activity—both because it provides a final criterion of interpretation regarding facts and because it constitutes an axial point for conjecturing about what is not yet known. A new belief is partially determined by old beliefs and partially by new experiences (CP 3.161).

Given this anticipatory or guiding character of conduct, we must consider how a general rule for action is assumed as reasonable by someone who holds it as valid. Peirce addressed this discussion in *The Fixation of Belief* (CP 5.358-387) and concluded that there are four methods by which one is led to sustain a belief: by tenacity, when belief is adopted as valid simply because it constitutes a possible response to doubt; by authority, when the validity of belief is affirmed by another; *a priori*, when belief is guaranteed by its seeming reasonableness; and by the scientific method, when belief results from unceasing dialogue with facts.

Although proposed during his “youthful” phase, the modes of fixation of belief gain pragmatic depth through the semiotic framework developed by Peirce. An explanation of facts is obtained through an inferential process characterized by the triad of abduction, deduction, and induction. Viewed from this perspective, the real difference in the degrees of explanation afforded by the modes of fixation of belief lies, according to Ibri (2019), in the different types of induction guiding the conclusion of inquiry—or, the rest of the intellect. Only the scientific method of fixing belief benefits from the highest degree of induction, the so-called quantitative induction, in which the principle of the *long run* and probability are taken in correlation. The other methods—tenacity, authority, and *a priori*, i.e. dogmatic beliefs—are driven either by crude induction, which maintains a hypothesis until it is refuted, or by qualitative induction, when the sampling obtained corroborates the investigator's preexisting repertoire—something close to what is now referred to as confirmation bias.

In view of this inferential specificity of the scientific method, we have sought in previous work (Baggio, 2021) to understand how the dynamics of virtual communication have influenced the degree of reliability and acceptance of belief. The immeasurable quantity of information disseminated through networks and the ease with which it can be accessed by those who have the means has undermined the experimental trustworthiness of methods of inquiry. The scientific method, grounded in probability and the long course of experience, has been discredited by the immediacy and saturation of content circulating on digital platforms. It is not merely a matter of rejecting science as a means for obtaining reliable beliefs, but rather of offering a logical support that guarantees the equivalence—however illusory—of the security attained by dogmatic beliefs in relation to scientific ones.

### 3 The status of belief in the dynamics of digital networks

The fixation of belief cannot be fully understood without the communal element that structures the scientific method. The community of investigators is not a mass of individuals gathered accidentally,

but a logical instance that guarantees the continuity of inquiry beyond the limitations of each particular interpreter (CP 8.12). Truth, understood as the regulative destiny of semiosis, can only be reached insofar as hypotheses are subjected to successive tests, distributed temporally and intersubjectively. Thus, the reliability of a scientific belief is not reduced to momentary consensus, but stems from its resistance to attempts at refutation and its capacity to withstand increasingly broader conditions of experience.

When we transfer the question of belief to the environment of digital networks, we notice that this communal criterion is distorted: the community of interpreters is no longer organized by the cooperative pursuit of truth, but by the formation of identity-based clusters in which information circulates as an assertion of belonging. Doubt ceases to be a stimulus for thought and becomes a threat to group cohesion. If, in Peirce, doubt is the engine of inquiry, on the networks it is neutralized so that contagion can continue. Belief ceases to be an opening toward the unknown and becomes instead a mechanism of symbolic self-preservation.

In the communicational dynamics of digital platforms, the sign is not simply transmitted: it is constantly rearranged by algorithmic operations that filter, rank, and intensify certain content to the detriment of others. There is no technical neutrality in this process: the very structure of the platform participates as an interpretant, modulating the possibilities of signification and determining which signs will be updated into habits. What reaches the interpreter already bears the marks of an algorithmic pre-interpretation, which selects what is more likely to generate engagement — and to engage means, fundamentally, to become contagious.

This allows us to understand networks as operative indices that link general elements — concepts, narratives, beliefs, etc. — to the particular experiences of users. By transforming probabilities of interaction into rules of visibility, algorithms configure an environment in which the signs most apt for replication prevail, not necessarily those most apt for truth. Highly selective semiotic processes are thereby established, in which the prevalence of a sign is measured not by the quality of its referent but by its ability to capture and hold the attention of its interpreters.

This process enables beliefs disseminated through networks to be accepted almost involuntarily and to spread with remarkable speed and immeasurable reach. This communicational phenomenon, exclusive to digital media, reflects the nature of contagion as conceived by Fracastoro (1546) in the context of transmissible diseases, but also by Serres (2013) and Giordano (2020), whose reflections address the concept of contagion in cultural terms. We therefore call transmission of belief by contagion the modes of conveying viral content through networks whose implications are perceptible in the conduct of individuals.

Belief contagion operates not only through the transmission of content but, above all, through the propagation of interpretive dispositions. In an environment marked by cognitive overload, agents do not have the time nor the intellectual resources necessary to subject every new piece of information to thorough examination.

Moreover, beliefs that spread by contagion exhibit strong connections to shared affects: fear, indignation, desire for belonging, a sense of urgency. These affects function as interpretive shortcuts, hastening the transition from a merely hypothetical sign to a sign adopted as a habit. By prioritizing content that intensifies such affects, networks convert contagion into a cumulative process: the more something is shared, the truer it appears, such that repetition may simulate evidence.

Thus, contagious beliefs impose themselves less by the solidity of their foundations and more by their compatibility with the emotions and identities prevailing in the groups where they spread. They become instruments of symbolic cohesion and markers of belonging: to reject contagion often means to reject the group itself, which may entail high psychological and social cost. Belief thereby acquires an emotional armor that renders it resistant even in the face of contrary facts.

## 4 The structure of contagious beliefs

The transmission of beliefs by contagion neglects the idea of long run as the temporal horizon of scientific inquiry. That principle is replaced by the speed with which content is disseminated through networks — immediacy — and by the exacerbated volume of sources, both receiving and emitting information — saturation.

However, certain implications must be considered: beliefs seem to depend on an agent who incorporates them into conduct based on their own experiences — and such experiences are not transmissible by contagion. How, then, can we think of beliefs “jumping” from one agent to another contagiously? Two criteria must be addressed in order to clarify this issue.

First, beliefs are not internal entities produced and individualized in each agent. They are modes of conduct, “recipes” for how to act in given situations. In this sense, Peirce states:

The essence of belief is the establishment of a habit; and different beliefs are distinguished by the different modes of action to which they give rise. If beliefs do not differ in this respect, if they appease the same doubt by producing the same rule of action, then no mere differences in the manner of consciousness of them can make them different beliefs, any more than playing a tune in different keys is playing different tunes. (CP 5.398).

Thus, to transmit a belief means to share a habit — a way of acting in a given circumstance. Although a belief may appear differently in consciousness, it is, given its nature as a rule of conduct, the same belief. Therefore, imitating or being inspired by the way someone acts ultimately means sharing the same belief.

Still, this characterization alone does not fully explain how a belief can be passed along. For this, a second criterion must be considered: beliefs are shared by means of icons, whose relation to their object is based on resemblance (CP 2.247). When we issue a command, for example, what is projected to the interpreter is an icon that produces an effect by restricting interpretive possibilities. “The only way of directly communicating an idea is by means of an icon; and every indirect method of communicating an idea must depend for its establishment upon the use of an icon” (CP 2.278). These being the basic conditions for transmitting a belief, how then does contagion transmit belief?

The contagion of beliefs operates through a triadic relation such that, if we treat it as a symbol, we observe three indispensable components for its effectiveness: the meme, the networks, and the belief. Restricting the concept of networks to digital communication platforms, and taking the notion of belief already established, it remains to clarify what we mean by *meme*.

The idea of the meme was first proposed by Dawkins (2006) to refer to a replicator whose function is to transmit cultural elements. Although this concept generated an entire field of study — memetics — with numerous researchers and critics, it was in the contemporary context of digital communication that the term *meme* became popular and detached from its initial biological analogy. Whether through images, videos, or audio, copied, transformed, and rapidly spread by users, memes have become a dominant form of entertainment and information.

Even though Dawkins’s proposal emphasized evolutionary analogy, what interests us here is not its biological dimension but its logic. The digital meme constitutes a kind of diagrammatic icon: its visual and sonic structure not only resembles certain real-world situations but also diagrammatizes relations and interpretations in a way that anticipates possible actions.

Its elements are highly combinatory and mutable: each replication introduces deviations, variations that test its semiotic adaptability in network flows. Such plasticity enables complex ideas to be coded compactly—often with humor or irony—enhancing its replication power. A meme does not need to argue; it acts, as it already delivers pre-configured potential interpretants.



By understanding memes as diagrammatic icons, we grasp their effectiveness in transmitting beliefs. They induce a way of reading the world, simplifying causal relationships and categorizing social actors. In other words, a meme offers the sketch of a habit, readily adoptable as a rule of conduct. This allows us to understand memes, semiotically, as “sign systems endowed with a tendency to adopt a flexible and intelligent translational habit” (Cannizzaro, 2016, p. 582), which “convey their content through an iconic bias” (Baggio, 2021, p. 165). How, then, are memes used to transmit beliefs?

Just as a symbol represents its object through a structure composed of an indexical element — connecting a general sign to a particular experience — a symbolic component — the unactualized habit — and an iconic element — which updates the habit and produces meaning (Santaella, 1995, pp. 173-175) — so too does the transmission of beliefs by contagion operate: the meme, by its representational potential, plays the role of icon; belief assumes the role of symbol as the general rule of conduct; and digital networks function as indices, instantiating generalities into particulars and guiding representational possibilities toward effectiveness.

Memes possess unlimited representational and interpretive potential. Each component offers a possibility of what can be represented. Likewise, belief, as a disposition, presupposes the necessity of action — it is a general rule. Through the networks, memes disseminated to thousands of users per minute become meaningful according to the repertoire through which they are interpreted. Belief gives shape to the representational and interpretive qualities of the meme. It is the networks that carve the generality of both meme and belief into particular experience, establishing the determinations between the possible and the expected.

This communicational phenomenon is the foundation of belief transmission by contagion. In such dynamics, where networks indicate how meme-qualities will be interpreted within a specific repertoire, the content of beliefs spreads faster and broader than a virus. They infect hosts who can hardly abandon their presuppositions, for maintaining a belief online means exhibiting a symbol that, by gaining more adherents, becomes increasingly durable. The exhausting dynamism of the digital world is the very mutability of symbols, which grow, expand their content, and preserve the representation of their object *in futuro*.

We can illustrate the symbolic functioning of transmission of beliefs by contagion with examples that reveal the articulation between icon, index, and symbol. Let us therefore consider two beliefs radically contrary to facts — yet widely shared and maintained by large groups, especially in digital environments: flat-Earth ideology and anti-vaccination campaigns.

**Table 1 – Example of structures of transmission of belief by contagion**

	<b>Flat-Earth ideology</b>	<b>Anti-vaccination campaigns</b>
<b>Icon</b>	Distorted maps, viralized DIY experiments	Photos of alleged side effects, metaphors of “control”
<b>Index</b>	Networks that reinforce communal bonds against epistemic authorities	Platforms that favored alarmist engagement during the pandemic
<b>Symbol</b>	Belief that scientific institutions conspire against “the people”	Belief that biomedical interventions threaten individual freedom
<b>Conduct</b>	Systematic distrust of any scientific authority	Putting the agent and their community at risk

In both cases, the final belief does not emerge from empirical investigation, nor from the final opinion upheld by a community of investigators as a result of interaction with the factuality of reality, but from the contagious flow of information. What is established as a rule of action is a consequence of the circulation structure: that which goes viral comes to guide conduct, even when it contradicts solid evidence. Semiosis, therefore, does not occur in dialogue with facts, but with the intensity of community and algorithmic engagement.

Beliefs that spread through contagion exhibit a kind of falsification of scientific investigation: they imitate certain effects of the scientific method—stability, trust, consensus—but eliminate its essential foundations: doubt, testing, and correction. It is a simulation of inquiry, operating as if the truth had been achieved simply because the sign reached wide circulation.

In this context, the greatest fragility lies not only in the beliefs themselves, but in the impoverishment of the conditions for belief formation: when a habit is established without having been truly tested, thought and inquiry cease to respond to the world and become cloaked in linguistic subterfuge, through which any narrative can be formulated and sustained.

## 5 Final considerations

Scientific inquiry, while prudent, is slow, exhausting, and can even be costly. Not to mention the distance that exists between the production of scientific knowledge and society at large, which benefits from the products of science without necessarily understanding the means by which they are made possible. In contrast, the dissemination and production of content via networks has encouraged collective participation. In a way, it has democratized access to the means through which information is constructed and to the purposes for which it is disseminated.

However, this is not enough. From a pragmatist perspective, the end of conduct prompted by beliefs through contagion is a mere “make-believe” (PWP, p. 256), a term used by Peirce to refer to the adoption of a concept without considering its effects and, above all, without subjecting it to testing in search of its consequences—a kind of mere talk without adherence to reality. It is well known that the most diverse narratives are spread via networks, and although their factual basis is often neglected, it eventually exacts a price.

If contagion operates as a simulation of inquiry, it is because it mobilizes certain communal dynamics fundamental to the formation of beliefs. The problem, therefore, does not lie in the social dimension of interpretation—an element intrinsic to Peirce’s logic—but in the perversion of the communal principle that guarantees the growth of reason. The digital community does not exist to expand possible experience, but to restrict it to the circle of interests that generates engagement. Instead of cultivating difference as a source of learning, it neutralizes dissent as if it were a threat to symbolic stability.

It is at this point that Peirce’s pragmatism offers us an ethical horizon: the idea that the development of reason is inseparable from a sense of continuity with others, expressed in his doctrine of agapism. For scientific beliefs to propagate, communal bonds must be built not on exclusion or hostility, but on mutual trust and cooperation in confronting doubt. Scientific beliefs only become collective habits when agents recognize that truth is something sought with and for others.

Therefore, more than defending science as a set of results, it is necessary to educate for the scientific method as a way of life: a) accepting fallibility without turning uncertainty into paralysis; b) embracing doubt as the engine of inquiry; and c) understanding error not as moral failure, but as a necessary moment in learning.

We thus propose a reversal of the problem: if beliefs by contagion spread so efficiently, we must, therefore, make scientific beliefs contagious. This is not optimistic naivety, but the recognition that rationality itself can be viralized, provided that the community is organized not by the logic of

engagement, but by the logic of the mutual growth of experience and reasonableness.

Digital society confronts us with a dilemma: either we allow our cognitive habits to be shaped by semiotic biases that privilege speed and affect over truth, or we reconstruct information circulation environments to favor openness to experience, critical dialogue, and the regulative ideal of scientific truth. How we respond to this dilemma will determine not only the fate of beliefs in our time, but also the very purpose of reason in its continuous quest to interpret and inhabit the world. Is there, on our horizon, any real glimpse of this possibility?

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São Paulo, v. 26, n. 1, p. 1-9, jan.-dez. 2025  
e-ISSN: 2316-5278

 <https://doi.org/10.23925/2316-5278.2025v26i1:e73858>