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Open community in Peirce's pragmatism

Abstract: Peirce's concept of "community" is a philosophical notion closely intertwined with society. The production of knowledge within a community entails the characteristics of the "knowledge production chain" revealed by Peirce's pragmatic maxim. Knowledge can only effectively grow within an open community that the dynamism of maxim has implied. The openness of the community essentially consists of two dimensions: internal structural openness and external orientation openness. Internal structural openness refers to the dynamic operation of the knowledge structure within a community. External orientation openness refers to the borderless nature of the community, that is, it can be open to other communities, accommodate the knowledge elements of others, and form its own developmental vitality. The open community relies on signs, where the mediating function sustains its operation. Signs partition and combine elements of experience, thereby carrying concepts and conveying information.

Keywords: external orientation; interpretant; knowledge; Peirce's maxim; structural openness

1 Introduction

Peirce's pragmatic maxim emphasizes the complete "knowledge production chain," which means the progression from object to conception, then to belief, leading to habit formation, resulting in act, and producing "practical bearings." The dynamic relationship among the elements within this production chain necessitates the openness of the community. Peirce consistently emphasizes that the community plays a crucial role in the acquisition of knowledge and the pursuit of truth. Peirce also believes that the essential attribute of a community is its infiniteness, which pertains to the productivity and growth of knowledge. He states, "Thus, the very origin of the conception of reality shows that this conception essentially involves the

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notion of a COMMUNITY, without definite limits, and capable of a definite increase of knowledge" (CP 5.311, 1868).

The openness of the community essentially consists of two dimensions: internal structural openness and external orientation openness. Internal structural openness refers to the constant dynamic operation of the knowledge structure within the community. Peirce employs the notion of "ultimate opinion" achieved by the community as a criterion to ensure the unity of knowledge formed around a certain object. However, the "ultimate opinion" is not static; it refers to the consensus opinion shared and developed by the members of the community. Since community members are constantly engaged in exploring objects or reality, the pursuit of knowledge, starting from doubt, is an ongoing process. The production of knowledge arising from this process operates in an interplay between closure and openness.

External orientation openness refers to the borderless nature of the community, that is, it can be open to other communities and accommodate the knowledge elements of others, thereby ensuring its own survival and development. Throughout the development of the community of inquiry, democratic communities (McBride 2009), scientific communities (Klein 2013), and aesthetic-based imaginative communities (Andrade 2022) can establish relationships of mutual absorption while ensuring their own existence, thus constructing a complete human society. Liszka has pointed out that Peirce attempted to elucidate the social structure of scientific theoretical activity through the concept of community, a structure that is consistent with specific social demands (Liszka 1978). Regarding the dual openness of the community, it is the dynamic nature of its internal structure that enables knowledge to possess the ability to transcend the boundaries of communities and assimilate elements from others. These two forms of openness ensure the vitality of the community. And knowledge can only be effectively produced and accrued within a community that possesses this dual openness.

Furthermore, whether it is internal or external openness, the operation of an open community relies on the mediating function of signs. This is because signs can segment and recombine elements of experience, thereby carrying concepts and transmitting information. As a result, each subject is able to engage in the translation of experience within the specific context, facilitating interaction and communication. It is evident that signs are essential conditions for sustaining the existence of the community.

Community is the concept in Peirce's pragmatism philosophy that is most closely related to the interface of society, exhibiting distinct social qualities. A knowledge community can be transformed into an interpersonal community within the context of reality, relying on social relationships to sustain its operation. In other words, a knowledge community must undergo socialization in order to ensure its own survival. At this point, the function of the community is not limited to the aspect of

knowledge inquiry alone. An examination of Peirce's pragmatism from a community perspective can not only help unravel the operational process from effect to knowledge, but also inspires contemporary vitality from a social standpoint of Peirce's maxim.

2 The pragmatic conditions for the openness of community

The pragmatic maxim constitutes the theoretical foundation of community. The developmental nature of the pragmatic maxim indicates that the community needs to maintain an open and dynamic state. By further clarifying the "knowledge production chain" of the pragmatic maxim, we can identify two dimensions within it. One dimension goes from the object to conception, while the other goes from conception to belief, habit, behavior, and ultimately to the effect. The convergence of these two dimensions in the pragmatic maxim relies on the introduction of signs, while the "interpretant" keep these dimensions in infinite dynamic operation.

The essence of pragmatism lies in defining the meaning of conception from the perspective of effect. In terms of the nature of effect, it can be categorized as contingent effects and general effects. Contingent effect is the effect that emerge from the specific context in which the pragmatic maxim of the knowledge production chain is formed. Conversely, general effect is the effect that is universally recognized, justified, and accepted by community members. Only general effect can be transformed into shared knowledge. The ultimate pursuit of the pragmatic maxim is the universality and unity of effect achieved by the community. This requires the community to filter, screen, and transform contingent effects in order to create universally applicable social knowledge. The elimination of contingent effects necessitates communication and practical testing among community members to truly grasp the regularities of objects and transform them into meaningful knowledge.

The universality of effect, to some extent, manifests as the interpretation of signs within a community, with the prerequisite being the shared cognitive objects. Universality implies an important condition: that the ultimate explanation guided by behavioral habits can be mutually examined among subjects. To begin with, the focus of the pragmatic maxim lies in the conceptual issue of conception in relation to the object, and the meaning of a concept is based on the effect that object can produce. In 1878, Peirce presented the classic formulation of the "pragmatic maxim," stating: "Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the

whole of our conception of the object" (CP 5.402, 1878). It should be clarified that these effects are not necessarily actual occurrences but rather "conceivable." Therefore, the pragmatic maxim can be seen as a method of logically defining meaning, which allows us to understand a concept based on the actual effect and influence produced by the object. Based on this understanding, the pragmatic maxim actually elucidates the "meaningful" cognitive process from conception to the effect of the object.

In accordance with Peirce's philosophy, a complete explanation of the meaning of a concept is not contained within any single or multiple forthcoming events. Rather, it is found within behavioral habits or in the universal psychological judgments regarding possible modes of conduct (CP 5.504, 1905). There are two key points in the realization of meaning: first, belief about an object leads to habit, and second, the ultimate interpretation of meaning relies on universal psychological agreement. Whether it is in the form of habitual rules of behavior or universal psychological judgments, both ultimately serve the "final logical interpretant," which aims to illuminate a hypothesis to the fullest extent and effectively "give us an expeditious riddance of all ideas essentially unclear" (CP 5.206, 1903). Therefore, the "final logical interpretant" actually entails the elimination and transformation of contingent effect, ultimately creating knowledge that can be shared by the community.

The intersubjectivity of sign interpretation in a community creates the conditions for its openness (cf. Apel 1981: ix). Since the pragmatic maxim is the theoretical foundation of the community, the consensual results regarding the meaning of signs are shared by the community. As a logical method, the pragmatic maxim is crucial in providing a means of using signs to explore the possibilities of information synthesis. The community plays the role of both the practical subject of this method and the sharer of the synthetic information constituted by the "final logical interpretant." The community is oriented toward the past as it actively participates in the historical process of sign interpretation. Simultaneously, the community is oriented toward the future, as the realization of behavioral effect is not the endpoint of meaning but rather a new starting point. With the sharing of knowledge within it, novel interpretations of signs are continuously produced.

Therefore, the community's cognition of an object is always open. The knowledge production chain based on the pragmatic maxim, from object to conception, belief, habit, act, and finally effect, constitutes the processing source of the community's understanding of an object. In other words, the community's interpretation of signs would be taken as the sequel of following the pragmatic maxim. This implies that the realization of effect and the growth of knowledge inevitably lead to the growth of the community. Thus, if the production of knowledge and meaning are seen as the goal of inquiry, the elements of the pragmatic maxim and the community respectively constitute the independent and dependent variables of the production equation. The independent variables are key elements such as beliefs, habits, actions,

and effects in the pragmatic maxim, which themselves are dynamic and evolving. The community, on the other hand, is the dependent variable, a result. The production and reproduction of interpretations regarding objects mean that all independent variables continue to grow, providing a continuous source of dynamic development for the community.

The transformation of the effect of the pragmatic maxim into knowledge relies on the productive capacity of the "interpretant." The "interpretant" is a meta-connection concerning the relationship between object and conception, conception and act, act and effect. With the emergence of the "interpretant," the instrumental function of signs transforms into innovative interpretations of each relationship. The interpretant has both internal and external sides. The internal aspect of the "interpretant" refers to new ideas, indicating that objects manifest new social resources. The mental image formed around the object is the "moment" of conceptual renewal. Organizing objects and enriching ideas requires knowledge carried by signs. Knowledge is a consensus shaped by social norms and a universally valid truth for members of the community. The "interpretant" essentially involves the processing and updating of knowledge, which needs to be realized through acceptance and understanding. The external aspect of the "interpretant" is the sign, especially the language sign, which serves as a carrier of social norms.

The community consists of two types of members: those actively involved in the process of the pragmatic maxim and those who receive the effects generated by ideas. In other words, the community both creates and receives. The interaction between these two types of members is facilitated through symbolic communication, and the innovative interpretations of object that arise from this communication are clarified by the "interpretants." Therefore, within the community, each use of signs adds a new interpretation. To be specific, this new interpretation is not only individual cognition but also includes the information generated through interactions between individuals. Each interaction among members of the community generates consensus, which, when encountered with new contexts, gives rise to new questions and, subsequently, new interpretations and information growth. This cycle continues endlessly. As Peirce qualitatively describes the community, it possesses a definite capacity to increase knowledge (CP 5.311, 1868).

The dynamic nature of the community itself leads to its openness. The openness is primarily based on three factors: first, as a terminal container, the community can accommodate all continuously growing contents of the independent variables as seen in the pragmatic maxim; second, the members of the community use signs as a means of communication, and the interpretants of signs are infinitely derived; third, the final consensus of the community is uncertain and fallible, and can continue to give rise to the production of new knowledge.

The openness of the community is manifested in both the temporal and spatial dimensions. Temporally, the internal openness of the community refers to the structural openness of knowledge. The knowledge production chain demonstrated by the pragmatic maxim requires a fixed and systematic knowledge structure to support the stable operation of the community. The universality of the effects implies that all concepts related to objects are grounded in regularities and can form a solid system. The openness of the knowledge structure is temporal because the communication and argumentation among members about objects cannot be halted and will inevitably generate new knowledge. Spatially, external openness refers to the community's ability to open up to other parallel communities, accommodating new knowledge elements, as the community itself is borderless. The dual nature of the community's openness ensures its infinite development and promotes knowledge renewal.

However, the so-called openness of the community is not absolute but conditional. It is cognitive activities that the community engages in, and the ultimate goal of cognitive activities is to obtain truth, that is, the consensus reached by the community. If the goal is to achieve consensus, each individual must adhere to scientific norms and engage in collective action. In other words:

> There are real things, whose characters are entirely independent of our opinions about them; those realities affect our senses according to regular laws, and, though our sensations are as different as our relations to the objects, yet, by taking advantage of the laws of perception, we can ascertain by reasoning how things really are, and any man, if he have sufficient experience and reason enough about it, will be led to the one true conclusion. (EP 1: 120, 1877)

Therefore, the formation of consensus within the community must be subject to certain norms of action. This reflects the social nature inherent in the concept of the community, and the essence of sociality is the problem of normalization. It is based on institutional norms that the community's interpretations of objects are always innovative within a certain framework. If the framework cannot be surpassed, it means that the conceptions generated based on objects will reach a state of suspension at a particular point in time, which is a temporary closure.

In conclusion, the open community is not only aimed at establishing the logical possibility of "ultimate opinions" but also seeks the philosophical basis for the establishment of social universality. Rationalization, as a characteristic of modern society, requires not only present rationality but also future-oriented rationality. The pragmatic maxim provides a logical method for exploring this social task. In this sense, "Logic is rooted in the social principle" (CP 2.654, 1878). The value of the pragmatic maxim lies not in rediscovering the inherent necessity of ideas but in promoting the infinite operation of the community within the dimensions of the pragmatic maxim, thereby renewing knowledge and developing society.

3 Internal structural openness of community

An open community aims at obtaining the "ultimate opinion" and operates in the form of inquiry activities. Inquiry not only serves as the mode of existence for the community but also fosters the openness of its internal structure. In each new problematic situation, the community undergoes a journey from doubt to inquiry. Through communication and interaction among individual members, a collective consensus regarding reality is eventually reached. Additionally, from the perspective of Peircean semiotics, the process of inquiry is essentially a process of sign inter-pretation, which is a part of the infinite semiosis. In the process of opening the internal structure, the community must draw upon the prior experiences of its members to generate innovative interpretations from the history of signs. This, in turn, promotes the reproduction of knowledge and the infinite development of the community itself.

The internal structural openness of the community arises from the activity of inquiry. Inquiry comes first and foremost from "doubt," and "doubt" arises from the birth of new problematic situations. Peirce argues that "the irritation of doubt causes a struggle to attain a state of belief. I shall term this struggle inquiry" (EP 1: 114, 1877). Therefore, it is through the generation of doubt that the members of the community engage in the struggle to acquire belief, with inquiry being intimately connected to doubt. As doubt is resolved, the struggle of inquiry comes to an end. "To satisfy our doubts, therefore, it is necessary that a method should be found by which our beliefs may be caused by nothing human, but by some external permanency" (EP 1: 120, 1877). It is evident that the process of inquiry within the community involves the scientific method of problem-solving and the elimination of doubt in different problem situations. With the emergence of new problem situations, new doubts arise, and new inquiries are generated. Therefore, the process of inquiry is never-ending, and the beliefs ultimately reached also remain open.

Although the process of inquiry itself is dynamic, the goal of inquiry is absolute, definite, stable, and consistent. The sole object of inquiry is the settlement of opinions (i.e., the acquisition of belief) (EP 1: 115, 1877). Whether it is the community members in Peirce's logical sense or the individuals in the real world, the single subject must interact with others, engage in collaborative inquiry, and strive to understand objective reality in order to achieve the ultimate goal of acquiring belief. In the process of inquiry, community members have to overcome the uncertainty, discomfort, and dissatisfaction imposed by specific situations, aiming to transcend the conceptual vagueness caused by doubt and ultimately establish belief.

Therefore, the internal structural openness of the community begins with the emergence of new problematic situations. Doubt propels community members to

initiate the process of inquiry, thereby driving new knowledge production. The process of inquiry, in turn, maintains the openness of the community, allowing it to accommodate diverse opinions and incorporate the perspectives, beliefs, and habits of each individual member. Through interactions among individuals, new consensus is formed, surpassing the old knowledge. Ultimately, the community is able to synthesize different problem situations and further develop the level of knowledge about the object.

Logically, the knowledge produced by humans faces the possibility of reaching its maximum capacity at a specific point in time. However, in the larger context of human society, knowledge is infinite and requires constant production and innovation. In response to this, Peirce proposed the scheme of "community" for knowledge production, stating that "logicality inexorably requires that our interests shall not be limited. They must not stop at our own fate, but must embrace the whole community" (CP 2.654, 1878). Therefore, this logical possibility demands that the community must have a continuous drive for inquiry, and this inquiry is connected to the individual perspectives and interests of its members. The community is composed of numerous individuals, and new knowledge often arises from the discoveries and formations of individual members. Hence, the role played by individuals in the establishment and exploration processes of true beliefs should not be overlooked.

However, the ideas and actions of individuals must also be recognized and regulated by the community. The inquiry activity "requires a conceived identification of one's interests with those of an unlimited community" (CP 2.654, 1878). In other words, within the members of the community, there must exist a "social impulse" (CP 2.655, 1878), which makes individual members aware that they are "mere cells of the social organism" (CP 1.673, 1898) and that "logic is rooted in social principles" (CP 2.654, 1878). In this sense, individual members are able to exercise self-control and establish a behavior characterized by concrete reasonableness.

Therefore, the openness of the internal structure within the community actually includes a set of relatively stable habits, dispositions, conventions, and rules, which determine the behavioral tendencies of individual members. This stability is inherent in the openness of the community and ensures close connections between individual members. In summary, the cognitive practices within the community are driven by shared goals, namely the establishment of beliefs. It does not require individuals to achieve propositional knowledge of the world through their beliefs, but rather to achieve a systematic understanding of the world through the cognitive integration formed through interactions among individuals. This process of cognition is constrained by the cognitive norms within the community.

It can be seen that the openness of the internal structure and the inherent stability it affords the community reflect the interactive relationship between

individual and individual, between individuals and the collective, indicating the issue of values between the community and individuals. Peirce affirmed the value of the existence of the community from a social dimension, stating that "the question whether the genus *Homo* has any existence except as individuals, is the question whether there is anything of any more dignity, worth, and importance than individual happiness, individual aspirations, and individual life. Whether men really have anything in common, so that the community is to be considered as an end in itself […]" (CP 8.38, 1901). It can be seen that in order to achieve the goal of inquiry, the value of the community must be recognized beyond individual values, and the individual's practice can rise to the benefit of the community. There are interactions between individuals, resulting in influences that go beyond the individual and meet the needs of the community. Existing knowledge and concepts can be spread through individuals as carriers, thereby promoting the overall reproduction of knowledge within the community. In order to achieve universality, the community must be open to individuals who can bear the consensus of universality, thereby enabling the community to have a unified will and ensuring the consistency of goals. In this sense, the stability of the internal structure of the community depends on the maintenance of individuals, and individuals need to bear collective responsibility. Peirce further points out the impact of the relationship between individuals and the community, stating, "if so, what the relative value of the two factors is, is the most fundamental practical question in regard to every public institution the constitution of which we have it in our power to influence" (CP 8.38, 1901).

However, Peirce prefers to emphasize the relative value of community as opposed to the individual's contribution to intellectual achievement, i.e., recognizing that community implies a sense-making that goes beyond individualism (supra-individualism) and tends to the collective good. Each individual is willing to consider their own interests as part of the infinite interests of the community and is willing to play a role in specific circumstances. Therefore, "individuality is illusory and by nature man is essentially communal" (DeMarco 1971: 35). Peirce also points out the results of individual inquiry: "All human thought and opinion contains an arbitrary, accidental element, dependent on the limitations in circumstances, power, and bent of the individual; an element of error, in short" (EP 1: 89, 1871). Thus, the inquiry activity of the community is a communal process in which the experiential knowledge between individuals can complement that of each other, and specificity can be filtered out, leading to the production of universal knowledge.

The interaction between individuals, and between individuals and the community, ultimately leads to openness because signs serve as mediators that support the survival of each individual member as a subject in the community. Firstly, signs represent objects; they are the means of externalizing concepts and conveying meaning within the community. Dewey states that the function of signs is to create

reflection, foresight, and recollection (Dewey 1929: 169). In Peirce's semiotics, the fundamental function of signs is to substitute for something else and convey knowledge about that (CP 1.339, 1895). Based on signs, each individual member can explore the knowledge contained within them, and through discerning the texture of signs, they can clearly trace the trajectory and methods of existing knowledge. It should be noted that signs are not direct reflections of experience but solidify through continuous interpretation within the community. The community can increase the capacity for the validation of knowledge. Therefore, the interpretation of signs undoubtedly has a subjective nature.

Each individual member has the ability to communicate through signs or interpret signs, but the transition from an individual's semiotic ability to collective practice within the community must go through the birth of meaning. Dewey (1973: 655) explains how signs make a community possible, stating that signs are interconnected, and the relationship of a series of events can be preserved through meaning. The subject's understanding, positioning, and control of events shape meaning. While events cannot be transmitted, meaning can be communicated and shared through the externalization of signs. When events are transformed into desires and purposes, they imply shared understanding and new relationships, thus transforming a collective activity into a community of interests and efficacy. It can be seen that meaning is the different perspectives and positions that people form about the same event, and the subject's positions and viewpoints play important roles in driving the development of the community. In the process of exchanging meaning, individual members can appreciate the value of the community to the individual and ultimately form meaning under conditions of consensus. When new situations arise, people's practices in different contexts generate new positions, perspectives, and viewpoints. On top of the original purposes and desires, new purposes and desires emerge, leading to the openness of the community.

The introduction of signs facilitates the openness of the community by providing a medium and tool for knowledge production, primarily manifested in the ability of signs to continuously energize "dynamical objects." In new situations, the community faces the overlap of "immediate objects" and "dynamical objects," and it is signs that give them a dual identity (Lu 2023: 41). If the product of the community's operation is knowledge, then objects serve as raw materials for processing. The production of knowledge generally goes through two stages. In the first stage, community members borrow existing knowledge to produce "immediate interpretants," which are the initial effects of meaning and imply that signs must have interpretability (Peirce and Welby-Gregory 1977: 110). Once "immediate interpretants" become knowledge, their dissemination marks the completion of the previous cognitive process. In the second stage, when new problem situations arise, objects enter a completely new field. At this point, the objects transition from

"immediate objects" to "dynamical objects," and the community's exploration of the current objects results in "dynamical interpretants." Therefore, the second stage is a crucial link in the generation of new knowledge, as "dynamical objects" trigger differences and create new meanings. When meaning achieves consensus and circulates, it transforms into knowledge. The appearance of "dynamical objects" involves grafting the initial objects onto new contexts, realizing a transformation from potentiality to actuality. The overlap of "immediate objects" and "dynamical objects" constitutes an important condition for the infinite development of the community, and its developmental process involves a transition from objects to knowledge, then back to objects, and finally transforming into new knowledge. The community's exploration of "dynamical objects" is based on cognition of the "immediate objects," and "dynamical objects" become the target of new cognitive processes.

While inquiry activity implies innovation, in order to achieve genuine belief, it is essential to ensure the security of cognition. The inquiry activities of a community construct new forms of cognition that distinguish themselves from previous knowledge, and objects serve as the hub for differentiating cognition, ensuring that the exploratory activities and heterogeneity of the community revolve around an unvarying center (Lu 2023; Mahowald 1973). At the same time, the generation of new cognition relies on the continuation of previous cognitive conditions. The crucial function of objects is to guarantee the stability of cognitive practices and solidify existing knowledge. Through logical reasoning, community members engage in continuous debates to seek certain knowledge within distinctions and differences, thereby ensuring the security of knowledge production. As "dynamical objects" emerge in new contexts, they possess new attributes and features. The mediation of signs enables community members to have a constant basis for communication, thus fostering knowledge innovation.

The openness of the internal structure of a community serves the purpose of knowledge renewal. Knowledge renewal and community growth arise from the exchange of signs among individuals. On an individual level, cognitive abilities have inherent limits, and to some extent, the state of thinking inevitably leads to suspension, resulting in cognitive discontinuities and difficulties in reproducing new knowledge. Additionally, there will always be differences in cognitive abilities between individuals, making it challenging to achieve ideal consensus within a community. It can be said that the hierarchical differences among individuals ultimately prevent the realization of consensus. However, the ultimate ideal of a community is to reach a shared cognition and establish beliefs. Therefore, the community must rely on ceaseless sign communication.

The formation of communication relies on the continuity of the semiosis. Signs serve as mediators for communication, allowing the exchange of thoughts through

dialogue. Two thoughts can communicate with each other because thoughts themselves are signs. "Whenever we think, we have present to the consciousness some feeling, image, conception, or other representation, which serves as a sign [...] When we think, then, we ourselves, as we are at that moment, appear as a sign" (CP 5.283, 1868). In the community, the thinking process of individual members is the process of sign unfolding, that is, the process of sign interpretation. The interpretation of meaning is both rooted in the past and directed toward the future, with each interpretation being related to previous interpretations and subject to further interpretation by community members. This is because semiosis is fundamentally continuous and ongoing, that is a synechistic process. Peirce believed that "All communication from mind to mind is through continuity of being" (CP 7.572, 1892). Sign communication within the community is only possible when the users and interpreters of signs become part of the continuous semiosis, when their experience is enriched. With each exchange, the use of signs is not a mere repetition of *a priori* knowledge but a reprocessing by community members in conjunction with specific contexts. Signs not only represent objects but also trigger and propel the formation of new knowledge within the thoughts of other individuals. From a social perspective, the dynamical interpretability of human inevitably has limitations, which are determined by the norms of the social community. While objects take precedence in sign representation, the derivative interpretations made by individuals based on time, space, and context extend the objects into an infinite state.

Therefore, communication between subjects does not imply an exchange of equivalent information but rather an increase and innovation of information. The ultimate goal of sign communication is to stimulate community members to continuously trigger new experiences, incite new contradictions, raise new doubts, and ultimately converge toward new consensus based on foundational communication. Peirce pointed out that "ideas tend to spread continuously and to affect certain others which stand to them in a peculiar relation of affectability. In this spreading they lose intensity, and especially the power of affecting others, but gain generality and become welded with other ideas" (CP 6.104, 1892). It can be observed that through communication, individualistic cognition is leveled out, with personalized ideas being covered by the meaning produced through collective communication, no longer possessing the ability to influence and manipulate the ideas of other individuals. Consequently, subjects attain the universality of ideas and achieve the "final opinion," namely the consensual opinion of the community.

The concept of the "final community" proposed by Peirce provides support for the ultimate reality that serves as the core of truth and meaning, characterized by universality, possibility, and continuity. The final community is a gathering of explorers who share a spirit of inquiry, an intention to communicate, and a goal to establish beliefs. All doubts and inquiries are always based on the consensus of the

final community. It is through the feasibility of eliminating doubts that members partially share the final community, allowing signs to circulate within a certain social community. Therefore, under the operation of semiosis, the internal structure of the community can be in an infinite state of development.

In summary, the internal structural openness of community begins with doubt, relies on inquiry activities, and ultimately achieves a shared belief, namely the universal recognition of meaning. In the community, people's sensations, emotions, impressions, perceptions, instincts, and conceptions regarding objects constitute a "common sense" (CP 1.654, 1898) in Peirce's view. This common sense belongs, in Peirce's view, to the "commens" of all individuals who act semiotically, and thus constitutes the basis and core of the habitus of the actors in the community. The meaning of each sign is the result of continuous interpretation, extension, and growth by numerous individuals. All individuals engaged in semiosis share and become part of the community's beliefs through information exchange.

However, the key to the internal structural openness of the community lies in the fact that shared beliefs are not an endpoint but a new starting point. The community always embodies the stability of institutions and the infinite openness of meaning. On the one hand, the community requires a state of determinacy and stability to support its existence. This state primarily arises from communication and under-standing between individuals, ultimately reaching a consensus. The achievement of consensus, to some extent, places knowledge in a suspended state, accepted by the collective. If a certain stage of consensus is stipulated, knowledge is protected by institutionalization, and the community becomes closed. However, this state can only be temporary. On the other hand, with the emergence of new problem situations and the arising of new doubts, members of the community engage in new inquiry activities and form new consensus. In this process, the community encourages self-criticism and a beneficial attitude of doubt, reflecting on existing beliefs based on genuine doubt. At the same time, it allows and encourages open criticism, providing all participants in inquiry activities with opportunities for criticism and refutation, allowing alternative viewpoints to be presented. Ultimately, the knowledge forma-tion within this community operates in a state of infinite openness.

4 Externally oriented openness of community

The community is externally open, with no clear boundaries, to the community of the "other." Peirce states, "This community, again, must not be limited, but must extend to all races of beings with whom we can come into immediate or mediate intellectual relation. It must reach, however vaguely, beyond this geological epoch, beyond all bounds" (CP 2.654, 1878). This indicates that the boundaries of the community are

ambiguous and possess attributes that transcend time and space. Furthermore, Peirce's discourse emphasizes the inseparable connection between the boundlessness of the community and its social nature. From a social perspective, the strength of the community lies in its ability to transcend the limitations of individuals in terms of lifespan, cognitive capacity, and other aspects within the vast human social context, uniting people from different social and cultural backgrounds to collectively explore true beliefs and continuously approach and establish genuine beliefs.

The borderlessness of the community as an external aspect of its openness implies a social dimension. Peirce proposed the famous principle of "logic socialism," stating that "he who would not sacrifice his own soul to save the whole world, is, as it seems to me, illogical in all his inferences, collectively" (EP1: 149, 1878; CP 5.354, 1868; CP 2.654, 1878). The principle of logic socialism indicates that the collective value of the community surpasses the individual's particularity and serves the progress of the entire society. Furthermore, from the perspective of social knowledge progress, logic supports the social dimension. Here, sociality refers to the universality principle of the open community beyond the logical dimension. Peirce's community scheme involves a transformation from the logical dimension to the social dimension, essentially involving the universality of logic and society, both of which exist in an overlapping supportive relationship. The logical goal of the community is to establish beliefs, while the social goal is to produce knowledge. From the perspective of knowledge innovation, the community can transcend the limitations of its own beliefs and maintain a pattern of openness, absorbing knowledge elements from other communities, managing relationships between groups, and ultimately serving the entire human society with the knowledge creation.

Peirce's proposition of "logic socialism" ensures that human society can attain universal knowledge. When a community faces a problem situation and only cares about its own fate, it cannot act logically; only when it also considers what happens in all possible cases can it act logically. Therefore, the community must break through its own internal limitations and move toward broader social knowledge development. It is evident that, in Peirce's view, no individual subject can attain ultimate knowledge; knowledge can only come from the interactive practices between subjects. The acquisition of knowledge is a collective achievement. Any community that wishes to become a qualified knowledge subject must accept public evaluation. Thus, if a community wants to achieve the universality and collective value of knowledge, it should pursue common responsibilities, norms, and goals with other groups. The standards of knowledge are jointly set by the diverse interests created by the community in extensive social interactive practices.

Signs not only serve as the means of communication for internal knowledge operations within the community but also as the way to access external knowledge elements. The social nature of signs enables the communicative aspect of the

community. Communication implies the relationship between communities. Signs are not only the operation of thought itself but also the foundation for the continuous generation of new thoughts. At the same time, signs can overcome the incommunicability between the community and external thoughts by manifesting different ideas in an externalized form. The continuous output of community knowledge relies on the uninterrupted interaction of thoughts between communities, and the prerequisite for this driving force lies in the old knowledge serving as the basis and condition for new thoughts. Thoughts operate in semiotic form, which in turn extends signs without interruption. On the one hand, signs circulate within the community as tools of cognition used to understand objects. On the other hand, the social nature of signs determines that their purpose is social communication, facilitating communication and information sharing between different groups. It is within the vast social context that the knowledge carried by signs circulates. The renewal of human social concepts relies on signs, which carry established knowledge, constitute the conditions for the community to approach other communities, and create new elements of knowledge that can circulate.

The transfer of knowledge in human society requires pauses, suspensions, and reinnovations. The creation of knowledge and the operational processes of the community's external openness are synchronous. Firstly, the community itself needs to preserve a substantial amount of existing knowledge about objects. This knowledge serves as the foundation for maintaining basic communication among members and for creating new knowledge. The transfer of knowledge between different communities requires this existing consensus, which guarantees the stability and objectivity of knowledge creation. However, the differences in cognitive goals among different communities inevitably lead to a reduction or even absence of consensus. As a result, the interactive cognitive practices between communities are hindered. New social contexts require new consensus, which becomes the driving force for collective participation in the creation of new knowledge.

Due to the different cognitive goals of different communities, there are differences in the cognitive stages and abilities related to the same object. Therefore, objects have developmental potential in terms of their cognitive stages and abilities in different communities. Signs function as the abstract and mediational form of objects and serve as resources for the development of new knowledge. Objects are not initially accepted by the community's knowledge base but remain in an output state. Specifically, inquiry activities ensure the derivation and deepening of concepts, as well as the cognitive agency of individual members within the community, which involves the transfer and extension of cognition. It is precisely because objects remain stable that regardless of which signs the community uses, communication revolves around the same object, with different signs representing the same object. The represented object is the one that enters the sign and it varies with the changes in

signs, but its original form remains unchanged. Depending on their nature, objects can be divided into two types: the object itself and the object processed by signs. The object itself is immutable, while the semiotically processed object exhibits variations. Although the object undergoes formal changes through symbolization, dissemination, and mediation, its original form remains unchanged. It is because objects serve as the focal points for the continuous creation of new knowledge that various signs can establish organic connections, facilitating the external communication of the community. Regardless of how enriched the meanings explored by individuals are, they cannot be separated from the common object, which serves as the shared premise and logical starting point. Even when the object is enveloped by personalized signs within the community, the object as the object of communication consensus remains unchanged. Therefore, objects serve as the coordinates for the transformation of knowledge, and the loss of objects breaks the crucial connection between communities, resulting in a stagnation of social knowledge production.

Only when signs enter specific social contexts can the concepts related to objects be perceived and understood by the community through their material forms. Dewey believed that the "index" reflects the close connection between signs and social contexts. Only within a certain social space can signs represent the characteristics adjacent to that space: "[L]inguistic signs interlock with indexical signs. It suffices to say that such interception takes place and that by and through it linguistic signs get that reference to and connection with 'things' which by themselves they lack" (Dewey 1946: 91). It can be seen that at this point, signs, carrying concepts, become knowledge that can be referenced, providing resources for "interpretants." Signs can trigger "interpretants." Therefore, in the process of knowledge innovation, signs need to be continuously interpreted by different communities' interpretants to enhance their abilities. This dynamic characteristic is the driving force behind the formation of sign capabilities. Semiosis is the recording of specific cognitive activities of a particular community. It serves as the mediation of members' thinking and behavioral processes and is the fundamental premise for the community to realize its sociality.

Within the context of real social interactions, the fuzziness of community boundaries is closely linked to the generation of "interpretants." The communication process between communities always involves contextualization and recontextualization, which refers to the process where sign expressions transition from the general to the specific (Lu and Liang 2022). Communication between communities revolves around a certain object, where one party initiates by sending signs, triggering a response from the other party. This response, taking the initiator's signs as its starting point, transforms into another form of signs through its own expression. This process involves contextualization and recontextualization. Contextualization is when the previous community transforms the generality of language signs into

specificity, while recontextualization is when the subsequent community further recontextualizes it based on its own characteristics, thus creating a new specificity relevant to its own context. Therefore, the community's understanding of objects always directly stems from the intuition and perception of signs from others. In the process of continuously borrowing, absorbing, and expanding the meanings of signs, cognitive unity is achieved with other communities at a higher and more comprehensive level, deepening the understanding of objects and driving knowledge innovation in human society.

The external openness of a community is infinite, manifesting as the complexity and endlessness of communication between communities. Each successful communication between communities is a temporary resolution of the ambiguity surrounding a specific object, representing a temporary state of achieving clarity in concepts, meanings, and ideas. However, ambiguity is persistent, as human society continually strives for clarity, which implies the endlessness of communication. When communication occurs, all natural events undergo rethinking and revision. The thinking of the community does not stop, and the accumulation of experiences does not pause. This process gives birth to new ambiguity. In the ongoing process of removing ambiguity, attaining clarity, establishing beliefs, and seeking truth, it points toward the ultimate goal of universality and attains shared, collectively recognized knowledge. From a social perspective, the stability and infiniteness of social relations are precisely maintained through this semiotic communication between communities. Regardless of the type of community, communities' pursuit of the "universality" of knowledge is precisely the driving force behind symbolic communication.

Although the universality pursued by human society is an idealized state, it is not unattainable at the societal level. In a sense, social stability is maintained through universality. On the one hand, social stability is ensured by a universal consensus that is examined and recognized between communities, constructing an ideal state of society. On the other hand, due to conceptual fuzziness and experiential differences, there is a continuous need for increased social communication to generate new understandings and compare them with existing knowledge, resulting in new perspectives in the process of understanding objects. In the communication process, the community's primary experiences transform into derivative experiences (Dewey 1929: 1–39). Through external cooperation, the derivative experiences possess richer connotations. However, these derivative experiences can be suspended at specific moments and transform back into initial experiences, stored in the community's knowledge base as stable knowledge resources. This relatively stable knowledge, through examination by the entire society, can constitute the source of universal knowledge.

5 Concluding remarks

From the perspective of community, Peirce's pragmatism not only helps decipher the process from effect to knowledge but also stimulates the practical vitality of the pragmatic maxim from a social standpoint. Individual members of a community embark on inquiry motivated by the desire to eliminate doubt and acquire belief, adopting an open attitude toward the establishment of belief. As a result, the internal knowledge structure of the community is constantly in a dynamic operation. In Peirce's pragmatism, individual inquiry is not socially rational; he emphasizes collective practice. Collective practice is not the mere aggregation or averaging of individual actions but rather repeatable, verifiable, and universally valuable behavior. The external openness of a community needs to be examined within the broader context of human society, with its focus on intergroup relationships. Only after the transformation of individuals into a collective can their ideas gain greater knowledge value and better connect with the social interface. Whether it is the internal or external openness of a community, the expansion of human social knowledge can only be achieved through the operation of signs. This process involves using signs, building on previous knowledge, and incorporating new experiences, thereby generating new possibilities in the cognition of objects and discovering new dimensions of understanding. Signs, as mediators of cognition, connect concepts and objects. Signs circulating in society carry prior knowledge and inevitably dissect new aspects, dimensions, and stages of objects through repetition and differences. This is not only a requirement for the growth of knowledge but also a necessity for social development.

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