

The Embodiment of Knowledgeable Behavior and the Mastery of Skills in Rishiri Fishery, Hokkaido

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Abstract

This paper investigates the process of acquiring the skills and knowledge of fishing activities in Rishiri Island through the theories of situated learning and social embodiment (*les techniques du corps*). Rishiri fishermen have three dimensions in their fishing activities. First, they acquire the skills and become good fishermen without special training programs. Second, they change their understanding of their performances and relationships with other fishermen whenever they practice more knowledgeable tasks than the previous ones. Third, they formulate the identity of Rishiri fishermen through acquiring skills and knowledge. LAVE and WENGER explored the same question in their research on *Vai* and *Gola* tailors in West Africa (1991) and called it the “identity of mastery.” Based on their argument, the learning of fishing skills and knowledge is contextualized in the social practices. The fisherman participates in the community of practitioners and acquires the skills and knowledge. This is called “community of practice.” A newcomer participates in the community of practice from the periphery, gradually becoming the old-timers. This is called the “legitimate peripheral participation (LPP).” In this context, I consider that social practices are the process of learning and/or acquisition, and all Rishiri fishermen acquire the skills and knowledge to transform their identities through LPP in the community of practice.

Keywords: Fishery, Embodiment, Knowledgeable Skill, Situated Learning, LPP

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I . Introduction

1. Cognitive Science and Social Theory

The idea that anthropology is a part of cognitive science was proposed in 1985, in “*The Mind's New Science*.” by Howard Gardner, 1985. However, it is doubtful if anthropologists ever recognized GARDNER's idea? Even if one were to argue that anthropology constitutes an important part of cognitive science, the anthropologists would not readily agree. This was a significant barrier to introducing the theories and methods developed in cognitive science into anthropology.

GARDNER's discussion especially focused on the structuralism in anthropology, founded by Claude LÉVI-STRAUSS (1962). The concept of “structure” in his structuralism is called a universal structure and targets “unconscious” (that is to say “structuralized”) behavioral tendencies. His structuralism is littered with terms familiar to cognitive scientists (even if they are not necessarily familiar to anthropologists). Hence, it can be inferred that structuralism actively (in a sense, arbitrarily) used psychological terms to construct its explanatory systems.

Until now, cognitive science has not shown much interest in the “context” of human behavior in social life, because its original landscape has been experimental psychology and pedagogy. It has used methods to analyze specific actions and knowledge by taking it out of context, so to speak. Therefore, the characteristic strategy of cognitive science is to use a computer as a root metaphor to describe the phenomena occurring in the human mind. In particular, the study of artificial intelligence (AI) is a research theme that mobilizes cognitive science. As a result, at a time cognitive science was reminiscent of AI research.

In the 1990s, cognitive science, as a grand coalition of sciences, was born to overcome behavioral science and, was required to be methodologically sophisticated. This may have been because AI research at the time had reached an impasse and there was a certain premise of “interdisciplinarity” in cognitive science. These were the dynamics inherent in the discipline that led to the search for new research themes and strategies.

Cognitive science, defined as the study of the activities of human knowledge, first undertook “analogy.” This is because, even if we study the activities of human knowledge in a nutshell, conventional academic disciplines have not prepared an appropriate conceptual apparatus for

objectifying the “activities of knowledge.” Therefore, we had to adopt a strategy to explain human behavior from animal behavior through analogies. However, while early research strategies using analogy successfully replaced simple movements of the rat’s body with mechanical machines, they have been limited in explaining what happens in the human brain. This was the first obstacle faced by cognitive science.

The advent of computers succeeded in overcoming this barrier. Although there were no visible moving parts, the computer performed complex calculations and storage. As a result, cognitive scientists were able to extend their analogy research strategy to the human brain.

The elucidation of information processing functions using computers was a certain achievement, however, it has been sharply criticized by the advent of Gestalt psychology, which emphasizes wholeness. In addition, the strategy of explaining the activities of human knowledge using the conceptual apparatus of information processing in the likeness of a computer is based on the claim that human actions can be decontextualized. Even if anthropology is called a part of cognitive science, no anthropologist will agree with it. This is because anthropology is based on the assertion that human actions are contextualized.

However, not all cognitive science has been context-sensitive. It is true that the traditional approach of cognitive science has focused on elucidating human intellectual behavior and its processing functions. Since the 1990s, it has tried to situate human behavior in the mesh of relationships woven by the society in which the agent lives. This research strategy is called the “situated cognition approach” and its trends differ from traditional cognitive science. It is difficult to include researchers who adopt this approach with the traditional cognitive scientists. Nevertheless, the birth of situated cognition approach has blurred the boundaries between cognitive science and anthropology.

2. Situated Cognition Approach

The starting point of the situated cognition approach was “on-site cognition.” To understand “on-site cognition,” it is necessary to focus on the tools that assist the practitioner’s actions in the field of social practice and the role of others in supporting them. Conventional cognitive science has tried to explain human intellectual behavior through the knowledge possessed by the agent.

Therefore, the use of tools to assist the actor and the assistance of others have been analyzed by the “nature of the knowledge that the agent uses when using them.” However, the situated cognition approach starts from the understanding that intellectual acts are created by the cooperation of the agent and things (e.g., the tools used by the agent and others who support the action). In other words, the situated cognition approach emphasizes that human actions are related to their environment (= context, situation) and is based on the assertion that human actions can never be analyzed independently of their context.

Cognitive scientists who have adopted this situated cognition approach are often called “situationist groups.” The situationism is a research trend born in the 1980s and its contours began to become clear in the 1990s. Recently, it has been understood as the development of new interdisciplinary research activities, rather than a new research program in cognitive science. This is because several researchers, distinct from conventional cognitive science, have been influenced by the situationist groups school and are involved in situational research. In addition, it is included in few anthropologists who have been influenced by the situationism.

The situationists attempt to understand “on-site cognition” through the cooperative relationship between the subject and the situation (context). This includes Comparative Cultural Cognition (COLE & SCRIBNER, 1974), Development and Activity theories in Soviet psychology (VYGOTSKY, 1934), Theorization of Intellectual Mastery (LAVE, 1988), and Affordance (GIBSON, 1979). It is considered that there were various research approaches and mutual exchanges. BROWN collectively called these approaches “situated cognition.” What these studies had in common was the research attitude of elucidating the relationship between the action and the situation to explain the action in the context of the situation (BROWN *et al.* 1989).

3. Socially Distributed Cognition

The conceptual framework of the situational cognitive approach is based on the idea that human actions are achieved in cooperation with actors and other things. In other words, it regards the people active in the field of social practice and the tools deployed in it as a structured system. Therefore, it calls these human intellectual acts “socially distributed cognition” as they exist beyond the agent and are dispersed between the actors and tools used by them.

Previous studies of socially distributed cognition include the navigation research by HUTCHINS (1993). He researched the U.S. Navy's ship navigation teams and found that their collaborative work was structured as a "computational system" that accomplished missions while avoiding errors caused by inexperienced members. His findings had three characteristics.

First, in the team, contrary to the flow of information, members are arranged in order of experience, from measurement staff to drawing staff [Fig.1]. As a result, each member is familiar with the task at hand and can detect signs of errors by inexperienced personnel who send information in advance and respond appropriately. In other words, sharing work experience (socially distributing the experience) can avoid break downs due to local errors.

Second, in the Ship Navigation Team, senior members share their experiences with the junior members, and the members are effectively arranged to actively avoid local errors through communication (e.g., conversations) [Fig.2].

Third, the work is accomplished in conjunction with the tools. Regarding the calculation systems using the nautical slide rule, HUTCHINS emphasized that instruments did not increase their abilities. He argued that the nautical slide rule, as a tool, and the actors (members) who use it are structured as a unit. He pointed out that when the actor and the tool are involved, the intellectual skill of accurate navigation of a ship can be achieved [Fig. 3].

In this way, the social practices can be achieved only when the socially distributed cognitive system, in which the three elements of the action and institutional division of labor, the communication between members, and the tools are structured, cooperate. In particular, multi-person collaboration is based on an institutional labor division in which members with different skill levels are effectively assigned. In other words, the actions of each member are constantly monitored, coordinated, and directed by other members of the action.

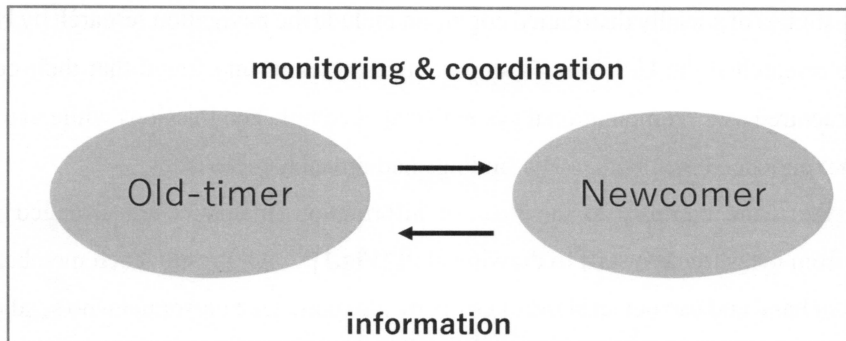


Fig.1 Information Flow and Staff Assignment

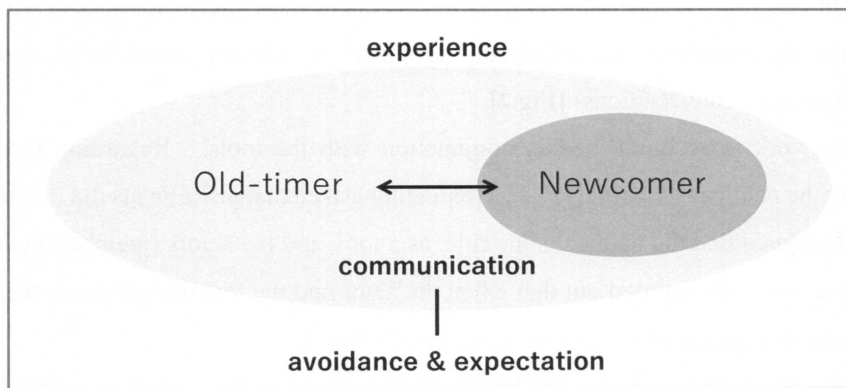


Fig.2 Sharing Experience and Avoiding Errors

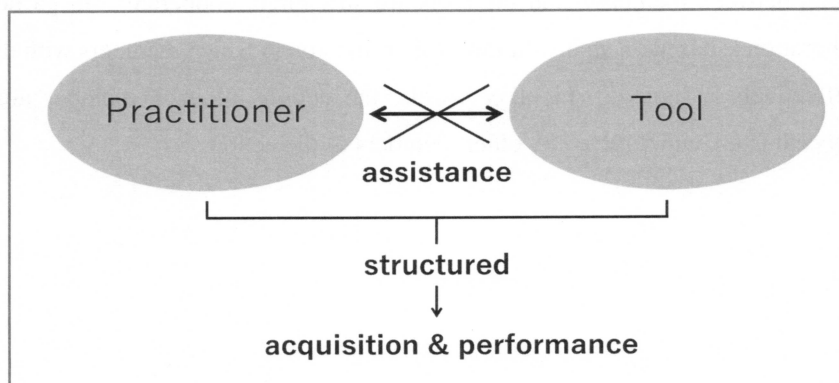


Fig.3 Relationship between Practitioner and Tools

4. Contextualization

If human behavior is embedded in a socially distributed cognitive system, learning behavior is the process of building a cooperative relationship between the system and the learning subject. Conventional cognitive science has directly analyzed the actions of the learner and their knowledge, however, the situated cognition approach describes the various relationships (learning contexts) surrounding learning. Therefore, the research strategy of revealing the action by carefully depicting peripheral matters is called the “decentering strategy” by LAVE and WENGER ¹⁾.

Communication with “more capable others” is important when the learning agent builds a cooperative relationship with the socially distributed cognitive system and achieves their actions. For example, if the learner is a child, a teacher, a parent, or a senior becomes “more capable other.” Even in HUTCHINS’ Ship Navigation Team, communication with experienced seniors was indispensable for executing actions by the newcomers (novices).

The intentional and intelligent human behavior which VYGOTSKY called “higher mental functions,” is similarly achieved as collaborative efforts in which more capable others support the learning subject in various ways. He called the state in which support is no longer necessary “internalization.” Internalization is a state in which one can take on the role without the help of others and control their actions. VYGOTSKY emphasized that the linguistic self-control method that internalized learning was neither innate nor arbitrary, rather a “skill” passed down to a particular society. According to his view, by mediating the “linguistic symbols” shared by society, actors can build a cooperative relationship with the socially distributed cognition system and achieve social practice as conscious and active agents.

The process of support by more competent others, as pointed out by VYGOTSKY is called “scaffolding.” ROGOFF stated that the entire process of adults and children collaborating on daily activities was structured to direct the children’s behavior (ROGOFF,1990). She revealed several intentional and unintentional orientations embedded in everyday child-adult communication. Children’s learning was not the special activities intentionally organized by adults, but a process in which children participated in various daily practices while being accompanied (supported) by adults. ROGOFF called this process of external support “guided participation.” This concept was similar to what Brown *et al.* (1989) called “cognitive apprenticeship.”

5. Mastering of Practice

External support, guided participation, and cognitive apprenticeship have one thing in common: the process of communication between the agency and a more capable person. The premise is that learning is a process of internalization of intellectual action. In other words, it is a conceptual device that describes learning as a process of mastery of a particular intellectual act.

It may be said that this perspective is important for anthropology. For example, it is relatively easy for a hunter-gatherer to find an ethnographic account of the process of an expert assisting a beginner in a particular hunt. In other words, among the cultural phenomena that anthropology targets, there are several areas of “external support.”

6. Analytical Perspective

Even if the science of sophistry considers anthropology to be a part of it, it is unclear whether it should be verified from the anthropologically. However, building a theoretical bridge between cognitive science and anthropology is not entirely meaningless in anthropological research. More than GARDNER's focus on structuralism, the emergence of situationism attracted a great deal of attention from anthropologists, theoretically and hermeneutically. The situational research strategy in cognitive science has considerably increased the responsiveness of anthropology and cognitive science.

This study examines whether cognitive science theory can be as durable in anthropology as it is in its field, using fishing activities on *Rishiri* Island in Hokkaido as a case study. These research trends, called the anthropology of cognitivism, which is easily confused with conventional cognitive anthropology, already exists in Japan. However, it must be said that it is an extremely small number of researchers. Furthermore, their research concentrated on traditional performing arts. Anthropology of cognitivism research on the traditional performing arts has produced some results, however, in terms of learning, subsistence activities also provide a wealth of data. This study compares and examines the two concepts that have not been explained in the same discussion due to academic differences “embodiment” in anthropology and “situational cognition” in cognitive science using learning theory and developmental theory.

II. Case Study

Rishiri Island is a remote island in the northwestern part of Hokkaido about 20 km from Sarobetsu on the west coast of Wakkanai by the Rishiri Channel [Fig.4]. It is a circular island that is slightly longer from north to south topographically, with about 63 km circumference and about 182.8 km area. Mt. Rishiri is the center of island, which is 1,721 meters above sea level.

This survey was primarily conducted in the Senhoshi area of Rishiri Town. The Senhoshi district consists of Nagahama, Kami-iso, Masadomari, Honcho, and Motomura. Honcho is the center of social activities in this area. The survey methods were interviews and participant observations. Interviews were conducted with fishermen, who make the management bodies, and fishery cooperatives. Participant observation was conducted in mutual aid and cooperation activities in kelp and sea urchin fishing.

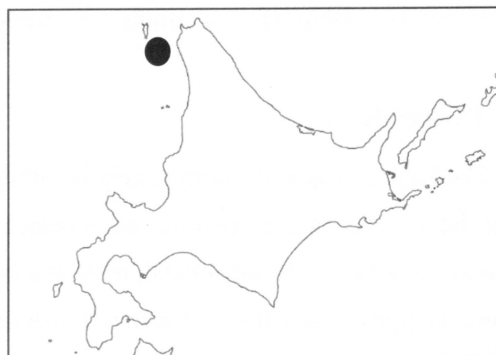


Fig.4 Rishiri Island, Hokkaido

1. Kelp (*kombu/Laminaria*) fishery

There are four types of kelp on Rishiri Island -wild, propagated, farmed, and accelerated. The wild kelp is grown in a natural state without human intervention. It is an unstable resource from the perspective of a stable supply and is an extremely valuable in the whole of Hokkaido, including Rishiri Island. The propagated kelp promotes spontaneous growth by throwing stones and setting up fish reefs. On Rishiri Island, there is no distinction between natural and propagated kelp. Both are collected and shipped as “natural kelp.”

The farmed and the accelerated kelps are collected and grown. The farmed kelp is collected after the seedlings are collected and allowed to grow in the sea for about two years. The accelerated kelp is chemically manipulated to shorten the growth period to one year. Both are shipped as

“farmed kelp.”

There is a large difference in the market price of “natural kelp” and “farmed kelp.” However, it is said that the productions of aquaculture and accelerated kelp are growing from the viewpoint of stable supply. Both types of fishing are carried out in parallel on Rishiri Island.

(1) Farmed Kelp

The fishing season for farmed kelp is earlier than that of natural kelp. It usually shifts to wild kelp fishing after farmed kelp fishing is completed. The fishing season generally starts from late June to early July. As mentioned, there is a large difference in the wholesale price of farmed and natural kelp, therefore, it is common to finish farmed kelp fishing early and prepare for natural kelp fishing. The fisheries association sets a deadline for fishing and collection of the farmed kelp. Since the farmed kelps are rooted in ropes stretched in the sea, the fishing is mainly a collection of ropes with kelp. The collected kelps are loaded onto trucks and transported to the drying area. The location of the drying area is determined by the fisherman. Women and children play a central role in cutting kelps from the rope and drying it with the cooperation of each household [Figs.5, 6].

Unlike natural kelp, farmed kelp does not systematically determine the collection date, it only determines the collection deadline. Therefore, the decision to go fishing depends on each household. For example, some fishermen may go fishing while others may not.

Since collecting kelp is a large-scale task, it cannot be completed by one household. Hence, fishermen who do not go fishing help those who have gone fishing. There is a coexistence of terrestrial and blood-related relationships.

Kelp must be dried immediately after collection, and the degree of dryness varies greatly depending on the weather. For this reason, it is carried out intensively in a short period even in a single day.

In the afternoon, the dried kelps are tied with a string for each size of the kelp, wrapped in a barn, and stored in the barn until it is shipped. In many cases, the day's work is completed by evening [Fig.7].



Fig.5 Drying Area of Farmed Kelp (1)



Fig.6 Drying Area of Farmed Kelp (2)

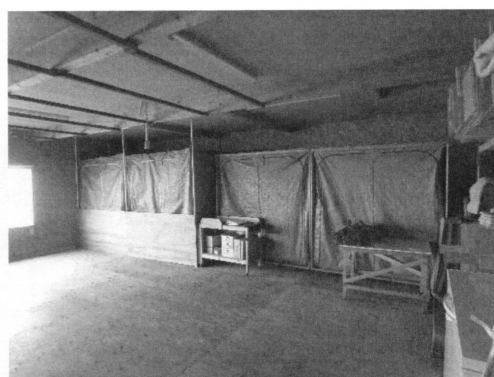


Fig. 7 Storage of Dried Kelp

(2) Natural Kelp

Natural kelp is harvested after the collection of farmed kelp is completed [Fig.8]. Natural kelp is collected by entwining it with a stick called a “*Nejiri*” (or “*Makkah*”) [Fig.9]. The work on board the ship is full-body labor and physically demanding. The fishermen has to hold the screw with both hands, use the oar with the right foot, and steer the boat with the left foot. As mentioned, kelp depends highly on the weather because kelp processing is always accompanied by sun drying. While for farmed kelp, the fishing is directly decided by each household, for natural kelp, the fishing is entrusted by the association to an expert fisherman called a “former flag signalman.” Therefore, as soon as the flag for fishing permission is raised, everyone collects intensively. There are differences in the judgment of each cooperative regarding the raising and lowering of the flag. Even if one cooperative goes fishing on a day, another cooperative may not. In addition, one association may lower the flag at a particular time, while another association may not. In other words, there can be a difference in the shipment volume each day depending on the judgement of the former flag signalman of each union. It is thought that the fishing time is about 2-3 hours.

Similar to farmed kelp, the collected natural kelp is taken to land at once, transported to a drying area, and dried all at once. Since kelp dries in almost a day, kelp dried early in the morning can be collected in the afternoon.

The collected kelp is sorted according to its length and tied with a rope in the same way as farmed kelp. It is packed in boxes and put on the distribution channel in bulk by the association. The name of the manufacturer (fisherman) is marked on the boxes.

2. Sea Urchin Fishery

There are two types of sea urchin fishing: *Ganze* (*bufun* urchin [*Strongylocentrotus intermedius*]) and *Nona* (northern sea urchin [*Mesocentrotus nudus*]). The fishing seasons almost overlap, however *Nona* fishing starts and ends earlier. Sea urchins are a valuable source of income because their selling price is higher than that of kelp. As with kelp fishing, the decision to fish for sea urchins is made by the former flag signalman. Each fisherman waits for the flag to be raised in their fishing grounds, and begins fishing as soon as the flag is raised. The time when the flag is raised depends on the day, and differ from each fishery cooperative association. The collected sea urchins are put



Fig. 8 Fishery of Natural Kelp

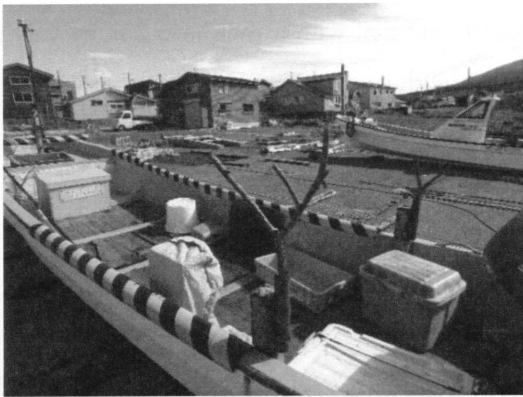


Fig. 9 Fishing Gears for Kelp and Sea Urchin

on a boat, brought ashore, and immediately packed into baskets by the whole family and transported to the temporary workshop set up on the breakwater. Everyone splits the sea urchin brought to the workshop, puts it out, arranges the meat in a colander, and ships it. In the meantime, the cooperative negotiates the wholesale price with the vendor.

3. Conflicts of Fishing Seasons and Decision of Fishing

Kelp and sea urchin fishing are carried out at about the same time, although there is a slight discrepancy. The overlap of fishing seasons on the remote islands of Hokkaido is not unique to Rishiri Island. Previous studies on overlapping fishing have interpreted the principle of the pursuit of profits in socio-economic activities as the strongest selection factor. Fishermen and associations explain that the wholesale price of seafood is the most important factor, especially in sea urchin fishing. This is considered to be a characteristic explanation for small-scale fishing villages in Hokkaido.

Even in modern times, fishing activities are largely dependent on traditional fishing methods and skills. This is because there have been no major changes in fishing methods, despite some technological innovations in fishing activities. In addition, due to the nature of the fishery resources of kelp and sea urchins, it is difficult to dramatically increase the catch through technological innovation. There is a concern that the stocks are shrinking, which may be the background to maintaining a strong dependence on folk knowledge about traditional fishing activities. As a result, it is difficult to deny ethnographically that their fishing activities are implicitly intertwined with “traditions.” In other words, concerning kelp and sea urchin fishing, traditional fishing methods are structured in society.

Conflicts in the fishing season and decisions significantly impact wholesale market prices. Kelp and sea urchin traders on Rishiri Island try to obtain better quality catches. The sooner they are put on the market, the more expensive they tend to be. However, early release to the market means that the fishing has to be cut off early. Hence, the decision to terminate the fishing requires an extremely high degree and comprehensive sense of balance. The cooperative makes this decision, and in this sense, it has a great influence on the lives of fishermen.

In addition, resource conservation is an important discourse. Excessive extraction depletes



Fig.10 Flag of Former Flag Signalman

resources and leads to a stagnation in market price. In particular, kelp from Rishiri Island can be traded at a high retail price and sea urchin is an expensive food in the Japanese diet. Therefore, the scarcity value is continuously maintained and the extraction is restricted so that the resource is not depleted.

As mentioned above, the decision to go fishing is made by the former flag signalman for both wild kelp and sea urchin. However, since the former flag signalman decides the time to lower the flag, he is expected to make a comprehensive judgement on the market and the fishing status of other associations on the island [Fig.10]. The former flag signalman does not go fishing. Former flag signalmen are selected based on their experience and proficiency in both wild kelp and sea urchin fishing. This position bears a large responsibility for the entire community. It is entrusted with a high level of judgment in response to market fluctuations and other factors, rather than simply making decisions based on the release of each fisherman. In other words, the former flag signalman influences each fisherman based on the decision to go fishing.

4. Mastery of Skills

Harvesting kelp and sea urchins requires a great deal of skills. Both make full use of the human body and take a considerable amount of time to learn. To be called a “skilled fisherman” or a “full-fledged fisherman,” a person must engage in fishing activities over a long period and eventually become proficient (or judged to be adept) in kelp and sea urchin fishing. Regardless of whether one aspires to be a fisherman, every family member of the fisherman must participate in the collection work from an early age. Children only participate in drying kelp and collecting dried kelp, and not in tasks that require a certain skill level, such as cracking sea urchin shells. However, as they grow, the work gradually expands and changes. These tasks are not taught in school education and the skills are acquired through constant participation and practice. It is impossible to measure the level of skill acquisition through explanations or exams. Even if asked to explain in detail, they often end up with extremely simple explanations or abstract narratives, sometimes maxims. Hence, these skills and the process of acquiring them are difficult for fishermen to articulate ²⁾.

III. Analysis

To become a skilled fisherman or full-fledged fisherman on Rishiri Island requires to become proficient in kelp and sea urchin fishing. When they are able to fish well, they are recognized as full-fledged fishermen and are considered qualified to be elected as a former flag signalman. It is understood that mastery of skills has reached the highest stage.

To gain proficiency in fishing activities on Rishiri Island, beginners often go out with their parents and older siblings and carry out fishing with their help. By repeating this work, beginners gradually become proficient in kelp and sea urchin fishing. Subsequently, the external support, as described by VYGOTSKY, that is, the role that senior fishermen and parents played for beginners in the early fishing activities, is no longer needed and the beginners can accomplish the fishing activities alone. In VYGOTSKY’s words, the higher mental function of fishing is internalized by the practitioners (fishermen).

The concept of “guided participation” and “cognitive apprenticeship” provide an explanatory

system for these fishing activities. As ROGOFF emphasized on the objectified stages of child development, the entire process of daily communal life of parents and children is structured to direct the child's behavior (cf. BROWN *et al.*, 1989, ROGOFF, 1990). In the life of a fisherman, the acquisition of intellectual skills, such as kelp and sea urchin fishing, is considered a part of everyday life in a structured way. Beginners will learn fishing skills from experts, because beginners and those adepts in fishing activities are generally family members. However, this does not mean that only specific learning is carried out for specific fishing. The acquisition of fishing skills is constantly carried out in daily life, regardless of whether it is conscious or not.

Fishing activities are never carried out in isolation, and are accomplished through the joint efforts of multiple households and families. The children of fishermen never immediately get on a boat and go fishing. Their initial work is the drying of kelp, namely stretching them one by one and air drying them. They gradually became engaged in transporting kelp and sea urchins from the fishing boats to land and to the drying area over time. Hence, they progressively move their work place closer to the fishing boats. Here too, experts and beginners are arranged in the opposite direction of fishing proficiency and they can monitor the work before them. Through simple communication, the workflow is streamlined and roadblocks are avoided. This workflow is similar to the navigation system of the Ship Navigation Team that HUTCHINS' targeted (1993).

Therefore, the acquisition of intellectual skills related to fishing activities to become a full-fledged fisherman is "routine" in Rishiri Island, and the socially distributed cognitive system to achieve collaborative work is "structured." They are never aware of or understand the mastery of their actions in terms of "internalization" or "coordination with the system." This is where the difference in understanding between the observer and the actor arises. In the field of work, it is often said that the skill has been "acquired." This is called "embodiment (*les techniques du corps*)" in anthropology. The embodiment refers to the form and process by which the body acquires skills and knowledge through learning embedded in practice. Since it is embedded in a social context and is routine learning, it is difficult to be aware of the learning process and the skills and knowledge learned. In other words, it is difficult for the subject's consciousness to intervene. Most of the common explanations for the acquisition of fishing skills on Rishiri Island are "learned to fish" or "became able to fish." This "on-the-ground understanding" is different from the analysis and interpretation of the observer. These narratives cause great changes in the process of beginners

becoming experts.

To become a full-fledged fisherman is not limited to becoming proficient in fishing activities. It requires changes in the skills acquired and understanding of the current activities (here it refers to fishing activities, such as kelp and sea urchin fishing). As a result, the self-perception as a fisherman (commonly referred to as “identity”) changes. Proficiency in fishing activities is a necessary condition for becoming a full-fledged fisherman, however it is not a sufficient condition. When they become full-fledged fishermen, their proficiency, understanding of the behavior system, and identity as fishermen are different from when they were beginners or semi-full-fledged fishermen. Therefore, changings these three dimensions make them experts (full-fledged fishermen). The changes in these three dimensions are summarized below.

First, fishermen accomplish their actions (fishing activities) with the help of others who are more capable (e.g., parents, siblings, or senior fishermen). When the “internalization” is complete, one does not need the help of others and accomplishes the act alone. The fishing activities on Rishiri Island observe this process of internalization (VYGOTSKY, 1934).

The use of fishing gear is particularly relevant to the proficiency level. As GIBSON explained, a tool is an extension of the hand, so to speak. In the dimension of tool use, it is understood to be a part of the user’s body rather than the user’s environment (GIBSON, 1979). Hence, as proficiency progresses, the tools become transparent to the users, and they feel as if fishing gears are moving as a part of the body. This “tool transparency” is the same for fishing, which uses multiple tools in a complex manner. Thus, fishermen need a great deal of skill to make the various fishing gears transparent ³⁾.

Second, fishermen’s understanding of kelp fishing changes dramatically when newcomers engaged in kelp drying begin to engage in different tasks, such as unloading or going fishing. Human relationships change as the fisherman grows. Hence, the changes in the work content, the mastery of skills, and the relationships surrounding the practitioners allow agent to reinterpret the situation surrounding them. Although this is different from the observer’s understanding, the shift in the practitioner’s perspective forms a new understanding of the social practice of fishing.

Third, the practitioners (fishermen) gradually increase their proficiency level, change their work understanding, and acquire the identity of a full-fledged fisherman. When young fishermen are beginners, they are placed in a peripheral position to the senior fishermen and parents who are highly

skilled. While they run errands, they acquire skills and knowledge through an overview of the entire work. By gradually increasing their proficiency, they change their work understanding and form an identity as an accomplished fisherman. These processes lead to the acquisition of membership in the society.

Hence, the mastery of skills, the understanding of work, and the formation of identity are not achieved in isolation and are acquired interdependently. There is no such thing as a “full-fledged fisherman” with low skills. A full-fledged fisherman, grasps the entire work, even if there is a division of labor. In addition, it is thought that there is a system for reproducing the full-fledged fishermen as these three dimensions are complexly related to fishing activities on Rishiri Island. Furthermore, the reproduction of good fishermen can be linked to the “place (community)” where fishing activities are practiced; that is, the structure of the local community and the discussion of production and reproduction.

IV. Concluding Remarks

Through the acquisition of intellectual skills and knowledge, the structure in which the three elements of mastery, on-site understanding, and identity change simultaneously are achieved through the participation of the agent in social practice and is called “situated learning” (LAVE and WENGER, 1991). In contrast to the learning theory centered on school-like learning, they focused on acquiring skills in apprenticeship and made full use of the strategy of behavior decentralization, in which the apprentices became “masters.” The process of transformation into a community organizer was revealed in the detailed descriptions in the anthropological monograph. When LAVE and WENGER analyzed tailoring work in *Vai* and *Gola* in Liberia of West Africa, they focused on the potential effects of the apprenticeship learning process⁴⁾. This awareness was a major starting point for situational learning theory. They paid attention to the gradual skills acquired by beginners in the division of labor in a community organized by practitioners called “masters,” where most of them eventually became new masters. They constructed the concept of a community called the “community of practice” and thought that the participation in the community

would determine the learning outcome.

The significance of newcomers in the community of practice starting from “peripheral” work can be explained through HUTCHINS’ case study. In addition, LAVE and WENGER indicate learning effects of treating newcomers as their seniors had treated them. They monitor the entire community through peripheral work, and observe the overall work that they will be engaged in the future and their behavior of the master or senior who will be engaged in that work. This is learning dynamic in which produce and reproduce of practitioners through skill acquisition, formulated in the participation of peripheral participants. Moreover, participation from this periphery is the most “legitimate” form of participation in the community, because it becomes a trajectory that gradually turns the newcomer into the old-timer, and almost all the participants in the community of practice become new masters in the future. With the above in mind, LAVE and WENGER defined the form of participation in such communities of practice as “Legitimate Peripheral Participation (LPP)”.

Based on their study of apprenticeship in West Africa, LAVE and WENGER defined learning as a form embedded in social practice, that is, a process of orthodox peripheral participation in the community of practice. They named the identity of the community of practice, which is acquired along with the skills and knowledge, the “identity of mastery.”

Through this formulation, it is possible to say that the situated learning is the process of acquiring the identity of proficient. Members of the community of practice never experience the kind of learning that is instructed in schools. However, they participate in community work organized by the practitioner and deepen their participation as they acquire skills and knowledge. Along with the production and reproduction of the practitioner (master) who hosts the community of practice, the production and reproduction of the community of practice is repeated.

The theory of situated learning, which considers learning as a process of legitimate peripheral participation (LPP) in a community of practice, is considered to be an argument similar to the *les techniques du corps* (embodiment) proposed by French sociologist Marcel MAUSS. It differs from conventional learning theories and anthropology’s “theory of culture and personality” in that learning (by the body) is embedded in social practice. MAUSS focused on *l’homme total*. However, his initial discussion was limited to an encyclopedic description of body techniques and their theoretical development did not take place in anthropology before 1990. In this regard, the focalization on “on-site conditions” in cognitive science and the proposal of concept of the situated

learning by LAVE, as an extension of this focus, were noted as major contributions to anthropology. It is true that MAUSS' theory of *habitus* has been “redeveloped” by reflective critical theories of structuralism, including BOURDIEU and GIDDENS. However, cognitive science has been more active in concrete discussions with detailed monographs than anthropology ⁵⁾.

Although LAVE and WENGER do not explicitly state it in their discussion, it may be interpreted that they effectively incorporated the techniques of fieldwork in anthropology to solve their problems. If cognitive science refers to anthropological research techniques and methodologies, it would be a fruitful task for anthropology to incorporate the theories and methods refined by cognitive science. Probably, the problem lies in the themes and cases that are objectified. However, now that cognitive science has begun to thematize the academic field that claimed by the social sciences as research territory, such as behaviors in context (situation), social practices, and identities, there is no reason for anthropology to not objectify them ⁶⁾.

In recent anthropology, where macro theories such as postmodernism, colonialism, culture and development, have become the center after structuralism, the theories of embodiment, situated learning, and LPP will make a major contribution to the essential research strategy of anthropology, which is to make microscopic observations from detailed monographic descriptions ⁷⁾.

[APPENDIX]

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[NOTE]

- 1) Compared to the depiction of a character in the novels, it is a method of revealing the appearance of a character by painstakingly depicting peripheral things such as the people around them, casual conversations, and the state of the room, rather than directly describing the character's appearance, personality, habits, and feelings.
- 2) When fishermen and masters in the apprenticeship systems are asked to explain their work, they are generally limited to talking maxim or using diagrams and simplifying explanations. This inability to explain in detail has been pointed out by POLANYI (POLANYI, 1966). Similarly, fishermen on Rishiri Island often find it difficult to articulate their fishing activities, even if they can do it.
- 3) DREYFUS, who is famous for his anti-AI principles, said something similar to GIBSON. When an actor reaches the level of an expert, the practitioner no longer needs to judge the situation, and can respond almost automatically to changes in the situation (DREYFUS, 1972, 1979).
- 4) "In that context it was simply an observation about tailors' apprentices within an analysis addressing questions of how apprentices might engage in a common, structured pattern of learning experiences without being taught, examined, or reduced to mechanical copies of everyday tailoring tasks, and of how they become, with remarkably few exceptions, skilled and respected master tailors." (LAVE and WENGER 1991:30).
- 5) The identity of mastery is an acquisition that encompasses the whole realm of the social body, instead of merely the acquisition of a particular skill. Moreover, compared to the formation of *habitus* by BOURDIEU, the idea of the community of practice is broader. The formulation of social and physical arrangements can express the formation process of *habitus* more concretely and visually. A series of problems in its internal processes can be newly formulated, while simultaneously, its analysis can be expanded to various practical domains.
- 6) The research of a few pioneering anthropologists have increased its responsiveness by subtly shifting the jargon between cognitive science and anthropology. In Japan, some researchers work together with anthropologists to solve problems in the so-called "situationist groups," or *Gibsonians* (researchers who have the same awareness of problems as GIBSON).
- 7) Even BOURDIEU, who exquisitely avoided the path of structuralism by incorporating structural characteristics and improvisation into his *habitus* theory, has been criticized for providing a detailed ethnography about the process of the formation of structure. It is not necessary to reject anthropology, which actively incorporates historical theories under the influence of cultural studies, such as SAID (1978) and ANDERSON (1983). However, it is necessary to refine the microscopic research program based on careful field surveys, which has been the specialty of anthropology. Hence, there is much to be learned from cognitive science, which, in some ways, has applied anthropological methodology more effectively than anthropology. Considering that cognitive science has searched for solutions to problems in adjacent fields, anthropology has entered an era in which it is required to have a certain degree of lightness in its theoretical footwork.

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北海道利尻島の漁撈活動における知性的行為の身体化と技能の熟達化

The Embodiment of Knowledgeable Behavior and the Mastery of Skills in Rishiri Fishery, Hokkaido

岡庭義行

〔要旨〕

本論は、北海道利尻島における漁撈活動に関する知性的技能と実践知の獲得過程について、状況学習理論と身体化理論を用いて体系的な記述と分析を試みたものである。特に、本論では、当該地域の漁撈活動を主に以下の3つの分析的位相に整理した。第1に、当該地域の漁師たちは特別な訓練やプログラムを経験することなく、その多くが「一人前の漁師」として成長していることに注目し、漁撈活動の知識と技能の社会文化的な習得過程に関する現地調査とそこから得られたモノグラフの記述を試みた。第2に、経験の浅い若い漁師たちがさまざまな経験を積みながら、徐々に一つひとつの作業が達成可能となることに連動して変化する自己理解と周囲との関係性のプロセスについて、長期的且つ継続的な現地調査により時系列に整理考察した。第3に、このような知識と技術の習得、自己理解と関係性の変化を通して、多くの漁師たちは当該地域の成員性を獲得し、漁師としてのアイデンティティを形成していくことを明らかにした。

かつて LAVE と WENGER は、西アフリカ・リベリアにおける *Vai* と *Gola* の仕立て屋における徒弟制に関する研究 (1991) の中で、徒弟制を通して獲得されるアイデンティティを「熟練のアイデンティティ (identity of mastery)」という分析概念を用いて解釈を試みた。本論では、現地調査から得られた資料を彼らの論点と方法論により再解釈し、「一人前の漁師」になるための知識、技術、理解・自覚等が、特定の漁撈実践だけでなく、当該地域の日常生活と社会的実践に埋め込まれていることを明示した。そして、このような漁撈活動を通して形成される当該地域の漁師たちのアイデンティティもまた、LAVE らが提唱した熟練のアイデンティティの一つであることを提示した。

これまで社会学や人類学が焦点化させてきた社会的身体をめぐる議論と視座は、認知科学によってより微視的な学習理論へと発展し、これらの学習の過程は「状況学習 (situated learning)」という概念によって体系化されたと考えられてきた。状況学習とは、実践共同体 (community of practice) への正統的周辺参加 (LPP) を中核とした学習と獲得の過程であり、本論は、当該地域の漁撈活動がこのような実践共同体への正統的周辺参加の特性を保持していることを明示することもその目的の一つとしている。

Keywords : 漁撈活動, 身体化, 知性的技能, 状況学習, 正統的周辺参加