

Reconceptualizing Tacit Knowing: A Phenomenological Perspective

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Abstract

Polanyi's theory of tacit knowing constitutes the theoretical foundation of knowledge creation theory. While tacit knowing offers critical insights to how people accumulate tacit knowledge, it assumes that the primary driver of knowledge creation is the conscious mind. We argue that this view does not fully capture the nature of how the mind works. We then contend that phenomenology offers the alternative and supplemental insights of the function of the unconscious mind, which shapes much of subjective experience, through which knowledge is created. The phenomenological insight not only enriches our understanding of how tacit knowing works but also offers practical solutions to improve our practice of tacit knowing.

Keywords: *Tacit knowing, tacit knowledge, knowledge creation, meaning, intentionality, intersubjectivity, essential intuition*

INTRODUCTION

The dynamic theory of organizational knowledge creation was created over two decades ago to explain how Japanese companies succeeded in innovation organizationally (Nonaka 1994; Nonaka and Takeuchi, 1995). The theory draws on several philosophical traditions, but none more than that of Hungarian-born British chemist and philosopher Michael Polanyi (Nonaka and Takeuchi, 2019).

In the early twentieth century, Polanyi came up with the concept of tacit knowledge, which has been largely overlooked as a component of human behavior in the social sciences. Without his concept of tacit knowledge, there would have been no organizational theory of knowledge, no SECI Model of

knowledge creation, and no explanation of the global success of Japanese companies (Nonaka and Takeuchi, 2019).

Polanyi (1966) distinguished the two types of knowledge: tacit knowledge and explicit knowledge. Tacit knowledge is an experiential, subjective, and embodied form of knowledge that cannot be easily expressed in a written or spoken word. It involves cognitive and non-cognitive skills (belief systems, mental models, intuition, and inspiration etc.) and bodily skills (expertise and know-how), that are internalized through repetitive experiences in certain contexts. On the other hand, explicit knowledge is conceptual knowledge that is context-independent, often expressed in general terms and theories (e.g. theoretical models, stories, charts,

documents, and manuals etc.).

Based on the notion of tacit knowledge, the dynamic model of knowledge creation describes the four cyclical organizational phases of knowledge conversion summarized as the SECI spiral, consisting of Socialization, Externalization, Combination, and Internalization (See Figure 1). The function of each phase is described below (Nonaka and Takeuchi, 2019):

1. Socialization: individuals share tacit knowledge through direct interactions. Through direct interactions, individuals absorb tacit knowledge about each other and the environment. During this phase, individuals gradually develop mutual understanding not only intellectually, but also physically and emotionally. Eventually, they share each other's minds.
2. Externalization: individuals conduct a dialectic synthesis of the tacit knowledge accumulated by Socialization at the level of the team. The synthesis leads to the articulation of the essence of tacit knowledge and the conversion of tacit to explicit knowledge in the forms of rhetoric and metaphors in language, images, and models.
3. Combination: explicit knowledge is collected from inside and outside the organization, and is combined, edited, and computed to form more complex and systematic sets of explicit knowledge at the organizational level.
4. Internalization: explicit knowledge amplified by Combination is put into practice. Individuals take actions within the context they are facing vis-à-vis the organization and the environment. Akin to learning-by-doing, the action taken enriches and elevates the tacit knowledge that is most relevant and practical to them, and becomes embodied as his or her own.

As the spiraling process of four phases continues, the organization creates and accumulates an increasing amount of knowledge, leading to innovation, agility, adaptation, etc. As you can see, the success of knowledge creation hinges on the first

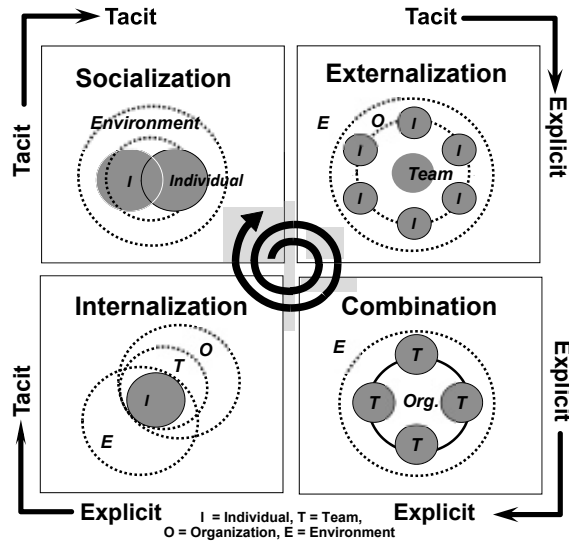


Figure 1: The SECI Spiral

phase, Socialization, where the individuals accumulate tacit knowledge, since we cannot create any knowledge without tacit knowledge.

Michael Polanyi (1966) characterized this process of accumulating tacit knowledge as “tacit knowing.” While the idea of tacit knowing is undoubtedly essential in understanding the process of knowledge creation theory, an even deeper understanding can be achieved through clarifying the most fundamental human mechanisms that are at work to make tacit knowing possible.

We argue that phenomenology allows us to understand this deepest nature of human experience. Phenomenology is the philosophical study of subjective experience. Since all knowledge is born out of subjective experience, we must pay close attention to the formation of the subjective experience to understand the process of knowledge creation. Phenomenology offers critical insights on this issue, by shedding light on the mechanisms of the subconscious part of the human mind. By understanding the comprehensive nature of why tacit knowing is possible, practitioners can know what exactly they should pay attention to in tacit knowing during the Socialization phase to accumulate tacit knowledge more effectively.

In this paper, we argue that tacit knowing is primarily driven by an unconscious process, rather than a conscious process. Chiefly, our

understanding of tacit knowing can be explained and enriched by the three phenomenological concepts: intersubjectivity, intentionality and essential intuition. Phenomenology is a powerful branch of philosophy that describes the essence and accommodates both science and art. With phenomenology as a backbone, the knowledge creation theory becomes more grounded and comprehensive.

POLANYI'S THEORY OF TACIT KNOWING

Polanyi (1966) states that the source of all knowledge, including scientific knowledge, is tacit knowing. All knowledge comes from subjectivity, and the act of knowing never happens from the objective standpoint. The commitment of one's whole being to a subject matter drives the act of knowing. And this commitment results in the creation of tacit knowledge, which is composed of emotion and reason, subjectivity and objectivity, and art and science.

Tacit knowing happens through "tacit integration," a process in which a human being combines various elements that constitute knowledge, creates a comprehensive and coherent concept from the bottom-up, and generates a new meaning.¹⁾ Tacit integration realizes all actions and methods of knowing. It is the human aptitude for invention, discovery and creation.²⁾

Tacit integration is a process of knowledge creation where the unconscious and conscious minds play different roles. The creation of new meaning cannot occur, if the process exclusively focuses on the particulars, or the details. A good metaphor here is a piano performance. A pianist cannot perform a musical piece in a meaningful manner, if she is too focused on each note and each movement of her fingers. The unconscious mind involves imagination and intuition, serving as a foundation for the creation of meaning. But not all the content of the unconscious mind can be articulated. On the other hand, the content of the conscious mind can be conceptualized and narrated, because meaning has already been ascribed to it.

Polanyi's theory of tacit knowing (1966) can be best understood as human and dynamic interactions with the environment, guided by a clear sense of purpose. According to Polanyi, tacit knowing

takes place with the unconscious mind interacting dynamically with the conscious mind.³⁾ The interactions that take place between the two dimensions of the human mind can be described as a four-stage process (Nonaka et al., 2016):

1. The actor goes about interacting unconsciously with various phenomena and events based on the knowledge he or she has.
2. Those unconscious interactions, in turn, result in the accumulation of tacit knowledge.
3. The actor, who at this stage becomes a "knower," consciously makes a judgment on where to "focus."
4. This conscious judgment results in the integration of accumulated tacit knowledge with aggregated knowledge.⁴⁾

In the first two stages, tacit knowledge is accumulated through direct, human interaction with the environment. As Teece (1977) points out, the acquisition and transfer of tacit knowledge can occur exclusively through physical human interactions. In the latter two stages, a conscious set of judgments are made on the focused points that will lead to the most relevant aggregated knowledge to be put into practice. A clear sense of purpose guides the actor to make judgments by providing an explicit direction to which actions should be taken. The aggregated knowledge generated in Stage 4 will be put into practice in Stage 1, completing the dynamic interaction loop of tacit knowing.⁵⁾

Polanyi's theory of tacit knowing is fundamentally about generating a new meaning. The dynamic interaction with the environment with a clear sense of purpose allows us to find a new meaning in an object, activity, or event. When we shift our attention from certain parts, or "particulars," of an object or activity to the whole, or from the whole to the particulars, we discover a new meaning. Conversely, an existing meaning can also direct our attention to certain particulars of the object, activity, or event in relation to its whole. In essence, tacit knowing is the process of meaning generation and discovery; at the same time, meaning can direct tacit knowing.

In Polanyi's view, meaning is created consciously

in tacit knowing. His theory fundamentally focuses on the conscious mind as the primary driver for meaning generation. The unconscious mind is neither systematically explored nor recognized as the active agent of meaning generation. Tacit knowing is also characterized as an individual process, rather than a social process. It forgoes explaining the social influence in the individual, subjective process of meaning creation (Nonaka and Yamaguchi, 2019).

Phenomenology, on the other hand, gives alternative insights into the functions of the unconscious mind and the social influence in meaning creation.

TACIT KNOWING AS A PHENOMENOLOGICAL PROCESS

Founded by a German philosopher Edmund Husserl, phenomenology is the study of subjective experience, which is the source of all knowledge. Husserl laid the foundations of phenomenology by studying how a meaning and value are created in the human consciousness of the self, others, and objects.⁶⁾

Unlike Polanyi, Husserl argues that the unconscious mind is the primary agent of meaning creation (Yamaguchi 2005). Regardless of how much you may perceive that you are creating a meaning consciously, it is the deep, unconscious mechanism of the mind that allows us to become aware of any new meaning or insight. Husserl also explains that meaning creation is never an individual process—meaning creation, in fact, has an inherently social nature. He gives three fundamental mechanisms that are present in all subjective experiences: intersubjectivity, intentionality, and essential intuition. Let's explain each of those.

Intentionality

In phenomenology, consciousness is considered to be always directed toward certain objects, regardless of whether we are aware of it or not. We see, feel, and understand something only because our consciousness captures that object. This function of consciousness—that it is always directed toward something—is termed “intentionality” in phenomenology.

Intentionality has two aspects. The first is passive

intentionality, where human beings perceive objects unconsciously, and the second is active intentionality, where human beings perceive objects consciously. Intentionality, especially passive intentionality, functions even when there is no distinction between a subject and an object. Before we recognize any distinction between objects, intentionality is already at work in the mind, capturing the world around us. For instance, we see and hear without a distinctive sense of subjectivity or objectivity. The concept of intentionality goes beyond the Cartesian view of the mind and body, which has shaped much of modern culture and society.

Phenomenology does not analyze subjective experience and objective, scientific phenomenon separately. Instead, it explores how and where subjectivity and objectivity emerge and interface with one another. It uncovers why human beings can immediately grasp the essences out of a number of commonalities and differences. Phenomenology conceptualizes the process of value and meaning creation, and pursues the source of human creativity.

Subjective experiences are characterized by people being inherently attentive to objects, argued Husserl, who explained that mechanism by using the idea of intentionality,⁷⁾ or inherent attentiveness to objects. For instance, one intended object could be a Chinese dragon, which can exist only in a fictional world; another might be a coffee cup, which can exist in the real world. Whenever we think of the imaginary Chinese dragon, we “intend” or become inherently attentive to the dragon; similarly, we “intend” or become inherently attentive to the coffee cup at the same time. Our subjective experiences are the result of synthesizing those intentionalities, which can take the form of feelings, emotions, presence of mind, and other personal responses.

While these examples may seem to highlight the conscious process of intentionalities, intentionalities can also be directed to objects unconsciously; that is, people can enact objects without their conscious effort. For example, when you accidentally walk into a room filled with music, you become aware of the music even if you do not intend to listen to it. In this case, you already hear the music without actively “trying,” as a result of your

intentionalities being unconsciously directed to capture the sound. The sound is, then, automatically merged with other features of the room, such as smell, temperature, brightness, and humidity, and constitutes your whole experience of “being in the room filled with the music.” Husserl calls this unconscious process of intentionalities that enact human experience “passive synthesis.” The conscious process of intentionalities that enact human experience is regarded “active synthesis.”

Both passive synthesis and active synthesis play the central role in the processes of creating meaning, and hence tacit knowledge and explicit knowledge, but the primary driver of knowledge creation, in Husserl’s view, is the passive synthesis or the unconscious mind. Polanyi, on the other hand, focuses on active synthesis in his theory of tacit knowing.

Husserl gives the primacy to passive synthesis because of his view on the innate human tendency to share bodily senses with others and how our mind develops from childhood to the adulthood based on that nature of physical connection with others (Yamaguchi 2005). He contends that people create new meaning out of empathy, because empathy allows us to transcend our own subjective perspective to discover new reality. When the empathy is exercised mutually by different individuals, it leads to form the fundamental source of subjective experience: intersubjectivity.

Intersubjectivity

Intersubjectivity is the state of deep, mutual empathy between two or more people. It is the subjectivity of “us” that transcends individual subjectivity. In this state, two or more individuals are exposed to each other’s perspectives, not just conceptually but physically and emotionally. The deep connection established through intersubjectivity allows them to understand each other’s perspective as if they are of their own, giving birth to a new meaning and experience.⁸⁾ This state of intersubjectivity is also primarily experienced through passive synthesis, as its origin is found in the earliest stages of our life, before the conscious mind is developed.

Intersubjectivity originates from human beings’ natural tendency to share bodily experience with others called “intercorporeality.” Maurice Merleau-

Ponty (1962) claims that the awareness of the physical senses arises from intercorporeality. When one’s right hand touches one’s left hand, the left hand also touches the right hand. Just like these two hands together constitute an integrated movement, the self and others share physical senses, time and space to experience the “oneness” of their bodies. These shared senses give birth to resonance and empathy.

This intercorporeality is fostered during infancy. When a mother breast-feeds or sleeps alongside her baby, they are sharing a sense of the “here and now” through bodily senses. This shared sense of the “here and now” becomes the basis of human empathy and remains the foundation of sensorimotor ability even after the baby matures into an adult. Despite that, intercorporeality is developed before the baby becomes aware of the distinction between their body and that of others, the baby gradually learns the distinction as they move their own body.

There is another revealing insight into the mother-child relationship formed during infancy. The Austrian philosopher Martin Buber claimed that an encounter between an infant and a mother is the first step for the baby to understand the existence of the other that is distinct from mere objects of perception. As a sense of ego develops during infancy, this relationship between the mother and the child—or what Martin Buber calls the “I-Thou” relationship (Buber and Smith, 1958)—sinks deep into a person’s subconscious, underlying the ability to perceive objects and use language.⁹⁾

Edmund Husserl (1970) states that people can share the consciousness and bodily senses of others through *paarung*, or “pairing” based on the deep connection between people.¹⁰⁾ According to generative phenomenology, for example, a human baby synthesizes its physical senses with its mother by just being in the same place, even before the emergence of self-awareness. *Paarung* allows us to perceive the body of another as if it is our “second” body through visual input and physical sensations. At that moment, the two bodies are mutually and simultaneously linked to one another. It is achieved as our body encounters the body of the other, and unconsciously resonates and empathizes with it.

Intersubjectivity essentially arises from sharing

the second-person perspectives with others, and through which a human being comes to realize their own subjectivity. Sincere dialogues with a selfless attitude highlight subtle and profound similarities and differences between the self and others. New meaning and value are created through this realization of commonalities and distinctions.

This notion of intersubjectivity in meaning creation adds an essential layer into how we create meaning: we, knowingly or unknowingly, always create a meaning socially, never individually.¹¹⁾ Without the comparison of different perspectives that you gain through the deep connection with other people, you cannot realize the meaningful commonalities or differences. Hence, without the function of social influence, you cannot even create any meaning—much less knowledge.

With passive intentionality and intersubjectivity at work, the unconscious mind finally bears fruits for knowledge—through the process known as essential intuition.

Essential intuition

Essential intuition is a process where similarities and differences in ever-changing phenomena are discovered, discriminated, and integrated into indispensable meaning—and knowledge. To grasp the essence of a thing or phenomenon, one must find the commonalities and dissimilarities with things or phenomena that one is already familiar with. Acquiring a diverse set of perspectives helps one to learn such commonalities and differences. For example, when we perceive a tree, we move around it, looking at it from many angles and different levels of brightness; we hear the sound of its leaves rustling in the wind and smell the aroma of the space. By utilizing all five senses with knowledge from navigating around the tree, we integrate common elements into the universal meaning of the tree.

The meaning of a phenomenon is first brought into consciousness through the interactions of the mind and external objects in a particular context, and then it is grasped through essential intuition through the function of the unconscious mind.¹²⁾ Meaning emerges in the process of discovering similarities among diverse differences or vice versa.¹³⁾ While filtering out differences based on

certain criteria, we relentlessly pursue the essences.

Essential intuition is neither deductive nor inductive; essential intuition is abductive, the source of creative thinking. Charles Sanders Pierce (1935) explains abduction as “the process of forming explanatory hypotheses. It is the only logical operation which introduces any new idea; for induction does nothing but determine a value, and deduction merely evolves the necessary consequences of a pure hypothesis. Deduction proves that something *must be*; induction shows that something *actually is* operative; abduction merely suggests that something *may be*.” (Pierce, 1935: 172). For example, when a doctor sees a patient, the doctor diagnoses the patient not only by looking at information on paper, but also by observing all the physical details and parts of the patient. Abduction is essentially the fundamental way of discovery and intuition.

There are three steps in this process of essential intuition (Sokolowski, 1999):

- Step 1: perceive similarities and/or differences between a chosen object and other objects;
- Step 2: discover one commonality among many similarities and/or differences;
- Step 3: discern the universal essence of things through “free variation” or “imaginative variation.”

Imaginative variation is a mental experiment aimed at determining the invariable feature of the object or phenomenon captured through subjective experience. In imaginative variation, features of the experience are imaginatively altered in order to view the phenomenon or object of attention from varying perspectives. Husserl argued that this process will reveal the essences of an experience, as only those aspects that are invariant to the experience of the phenomenon will not be able to change through the variation (Husserl 1970; Turley et al., 2016).

Total immersion into the object under investigation allows the essence of the object to reveal itself in the mind. Only with this immersion, can we encounter the reality of empathy. The process of essential intuition unleashes the creativity in people, transcends the boundaries of knowledge, expands

the space of exploration, and reveals the invariable essence.

Besides, intuition arises from the so-called “spacious present.” It emerges not just out of the past memory but also from the present moment and the anticipation of the future. And this complex integration occurs through bodily senses. In phenomenology, the past memory, which is typically stored in the body, is called “retention” and the bodily anticipation of the future as “protention.” The sense of the past, present and the future constitutes the spacious present. The present moment has a creative “width,” rather than being just a singular “dot” on one’s subjective timeline.

Let us explain these concepts with an example. When we hear certain sounds, we do not just hear them separately from other sounds. We hear the sounds with the anticipation of other sounds that are yet to come. Hearing always happens in a particular context born out of anticipation. “Now” is not an independent point in time but has its own width of time. Husserl calls this type of perception “retention.” All we perceive in the “here and now” is a product of retention.

On the other hand, our unconscious anticipation of things that are yet to happen is termed “protention.” Protention here is achieved through passive integration, where the future is anticipated from an endless, dynamic, and continuous process from the present and the past experience. The width of the present is determined by a combination of retention and protention. Retention and protention properly function together only when the human mind and body are fully present in the “here and now.”

The notion of spacious present suggests that time is a subjective property that individuals create on their own through the interaction between retention, present, and protention. Everything we experience is created through an “inside-out” rather than “outside-in” process.

As you can see, there is a considerable synergy between phenomenology and tacit knowing. The process of tacit knowing occurs fundamentally more unconsciously than consciously, and more socially than individually. Husserl’s phenomenology provides beneficial insight for how we find a new meaning through subjective experience.

THREE WAYS TO SHARPEN INTUITION

Exercising essential intuition is not easy. Controlling intuition is difficult to do consciously, since the intuition itself arises from the unconscious. However, this does not mean that you cannot cultivate the capacity for essential intuition. The process of intuition is an organic process of the unconscious mind and the conscious mind working together while the body takes action in the world. It is an embodied process of action and practice. Human beings master this process by sharpening their intuition through trials and errors.

Intuition is generally sharpened through accumulating experience, especially through cultivating a high level of bodily experience, empathizing with others, paying attention to details, improving the concentration of mind (Nonaka and Takeuchi, 2019). Based on the understanding that the unconsciousness drives intuition, we argue that to sharpen intuition is to train the unconscious. By that, we can take three approaches.

First, the idea of intentionality suggests that intuition can be sharpened through setting a certain purpose and values and internalizing them through practice and repetition. Purpose and value direct our attention to certain aspects of realities we face and become the criteria for assessing what to do in those realities. Different focuses and criteria, even if they are about the same phenomenon, result in different meanings, and hence, in knowledge. Thus, one can create a purpose and values to facilitate and improve the quality of knowledge creation.

Keep in mind that those objectives and values need to be remembered by your body for them to sink into the unconscious. Only then does the unconscious mind exercise the faculty of intuition based on those objective and values.

Second, one can sharpen intuition through establishing intersubjectivity with others and practicing selflessness. Intersubjectivity is the state of interpersonal relation where subjective perspectives are shared with multiple individuals, and it can be achieved through empathizing with others by “putting one’s own shoes into others.” Since one needs to transcend the boundary of one’s ego, one may practice altruistic acts and ways of thinking to

become selfless.

Intersubjectivity bridges individual, subjective perspective with that of others, not just on an intellectual level but on an emotional and sensorimotor level. Through this, one's unconscious mind gets connected to the perspective of others filled with new inspiration and tacit knowledge. With more perspectives comes more chances to discover similarities and differences between different experiences (Yamaguchi 2005).

Third, go to *genba*, or the space where the reality takes place, and take real action as much as you can. The idea of essential intuition suggests that essential intuition is only spurred by interacting with the dynamic reality. Without taking action in *genba*, no meaningful subjective experience can be obtained, and the unconscious mind cannot do the work of intuition. Being in *genba* also allows one to gain feedback directly, allowing the unconscious mind to grasp the better picture of the reality.

These phenomenological ideas tell us that the training of the unconscious is the key to sharpen the intuition, and hence create knowledge more efficiently and effectively. By understanding that it needs focus (intentionality), empathy with others (intersubjectivity), and direct experience (essential intuition), one can consciously shape one's unconsciousness to master the intuition.

FROM BEING TO BECOMING: TACIT KNOWING AS A WAY OF LIFE

In this article, drawing on the insights of phenomenology, we showed that Polanyi's idea of tacit knowing, the process through which we accumulate tacit knowledge, is actually driven as much by the conscious mind, if not more, as the unconscious mind. We also showed that tacit knowledge is not an individual but a social process. To understand how the unconscious mind creates meaning, we reviewed three phenomenological ideas: intentionality, intersubjectivity, and essential intuition. Based on each of those mechanisms, we suggested three basic practices to shape our unconscious mind, the primary agent for intuition and meaning creation.

Creating new meaning hinges on how well our unconscious mind functions. We can train the unconscious mind through active practice of

certain purpose and values, empathy, and direct experience from the dynamic reality. We need to practice to the extent that all of those sinks into one's unconscious habit and becomes one's second nature. Those practice needs to become embodied in every action that we take.

In other words, to train the unconscious is to change the way of life. Every action one takes will be remembered by the unconscious mind. And practice leads to the changes in how we experience our lives.

A human being is one entity, a being. But, if "I" engage in focused practice, in empathetic dialogue with others, or in direct contact with the reality, and come to create new knowledge, this "I" becomes different from the "I" of 30 minutes before. It is not a static, separate entity, but each of us is one continuous and dynamic process. A human being is actually a human *becoming*. From being to becoming, through the process of knowledge creation, a human being becomes who he or she really is.

ACKNOWLEDGEMENT

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NOTES

- 1) There are three techniques in tacit integration. The first is the art of seeing. In medical diagnoses for example, a doctor diagnoses a patient by examining an x-ray picture or the patient's body. The purpose here is to know the medical condition of the patient, based upon which the doctor tacitly integrates all the details into the whole—a diagnosis. Other examples of the art of seeing include distinguishing people's faces, evaluating art, and so on. The second is the art

of doing. When a pianist prepares for a recital, she practices until she can move her fingers to play her pieces unconsciously. For this purpose, she tacitly integrates all the senses and bodily experience into the whole—her performance. The third is the art of imagining. In his detective fiction stories, Sherlock Holmes says, “My reasoning is sharpened through years of practice. I can reach a conclusion without following each step of reasoning... If I observe the small details, I immediately get the essence of that incident.” Holmes detects small yet significant details and creates a coherent hypothesis. This art of imagining constitutes Holmes’ extraordinary detective ability.

- 2) Tacit integration has much in common with the method of abduction articulated by an American philosopher, Charles Sanders Pierce. Pierce states that rather than deduction or induction, it is abduction that gives birth to new ideas in science. The first step in abduction is indeed the observation and recognition of the facts. Abduction is distinct from other methods of knowledge creation in that it requires a sense of purpose. Purpose and beliefs give a specific focus for the mind. According to such purpose and beliefs, the details are observed and integrated into a particular hypothesis. Deduction, for example, analyzes and judges an individual phenomenon based on a given logical assumption; thus, no discovery beyond the given assumption will be revealed through this method. Induction, on the other hand, extracts the “universal truth” from a group of particular phenomena, but there is always an exception to this “truth.” For further explanation on the concept of abduction, refer to Yuji Yonemori, *Abduction*, Keiso Shobo Publishing, 2007.
- 3) Recent findings in brain science support the view that dynamic interactions among our mind, body, and the environment hold the key to how “intention” and “consciousness” emerge—another instance of two divergent scholarly tracks merging.

Complexity theorist Alicia Juarrero (1999) backs Polanyi’s position that the dynamic interactions of the body with the environment make

up a crucial aspect of knowledge practice. She focused her research on human intention, which represents the core of our consciousness, and concluded that it must be understood in the context of a dynamic interaction between body and the surrounding environment. Juarrero goes a step further than even Polanyi—who, you may recall, was also a scientist—as she believes that our intentions emerge from a complex adaptive system. In the case of the pianist, we talked about the need to integrate the relevant tacit knowledge of each finger into the “aggregate” knowledge of playing the piano. Juarrero has concluded that a complex adaptive system is different from an aggregate in that the properties of the components are dependent on the systemic context in which the components are located, but the properties, as a whole, embody unique qualities that don’t independently stem from any of the components.

The traditional view in brain science, known as the brain-bound view, asserts that the brain is solely responsible for our thinking and cognition. It asserts that the body serves merely as a “sensor and effector” system (Hurley 2008).

By contrast, the embodied cognition view rejects the notion that the brain is solely responsible for human cognition (Clark 2008; Varela, et al. 1991). Margaret Wilson summarizes the embodied cognition view as follows: “[U]nder the banner of embodied cognition[,] [t]here is a growing commitment to the idea that the mind must be understood in the context of its relationship to a physical body that interacts with the world.” (Wilson 2008: 625).

- 4) Formally, Polanyi (1966) framed this as an interacting process between particular (Polanyi’s proximal terms) and the emerging whole (distal terms) experiences. As Polanyi stated, “[i]t is their meaning to which our attention is directed” (p. 12).
- 5) Let us illustrate that by describing a concert pianist who is playing a piece of music written by Mozart. Knowledge of playing the piano requires various bits of tacit knowledge associated with the movement of each finger, as well as a relationship with the entire piece. However,

the pianist's onstage performance can be compromised if he or she focuses only on the details; that is, each finger movement as dictated by the notes being played. The pianist, while unconsciously moving the fingers as accurately as possible, must be conscious of the piece being played. The pianist must make a conscious judgment about where to focus, so he or she can integrate the relevant tacit knowledge of each finger into the knowledge practice of "playing the Mozart piece." A clear sense of purpose—how the pianist wants to stir or touch the audience with the music Mozart wrote—guides him or her to make a conscious judgment about where to focus.

- 6) Husserl's inquiry ultimately aims to understand how meaning is created in human experience. Husserl contends that the study of human experience must use a method different from those of hard sciences, because hard science alone does not help us answer the questions about meaning in our lives. Husserl suggests phenomenology as a method of this investigation and calls for a philosophical inquiry into how knowledge—including scientific knowledge—is created in human consciousness. (Husserl 1936/1970; Natanson and Husserl, 1973).
- 7) The idea of intentionality is unlike the passive view of our cognition characterized by, for example, James Gibson's notion (1979) of affordance, in which the existing objects afford opportunities for actions to us. Intentionalities are by nature active in the sense that we are the ultimate source of intentionalities.
- 8) Studies in cognitive neuroscience show that a person perceives other people not only from their physical attributes but by "putting on their shoes" to recognize their perspectives (Mitchell et al., 2005a; Mitchell et al., 2005b). These studies, which investigate the activities of the medial prefrontal cortex, present evidence that the human ability to understand other people's minds occurs at the pre-cognitive level; that is, even before such a consideration is recognized consciously.
- 9) This type of encounter is not merely one form of subjective experience but the fundamental

one that constructs a basic sense of time and space in the mind. The object of encounter may include other people, the environment, and consciousness itself. A truly genuine encounter happens when there is no more distinction between oneself and others. Free from egocentrism and self-interest, we wholly face objects and other people.

- 10) The recent discovery of the mirror neuron system has opened up the possibility that "mimicking" others might play a critical role in cultivating intersubjectivity. That leads to empathy, defined as the ability to experience what someone else is feeling, accompanied by a motivation to support that other person (Gazzola et al., 2006; Batson and Shaw, 1991).
- 11) Many new science studies confirm the human brain's social orientation. The mounting scientific evidence makes it clear that the brain urges human beings to get connected to others for survival needs, to act together, to cooperate, to care about others, and to pursue the common good. These findings provide support for Aristotle's concept of *phronesis*, which has the pursuit of the common good as an integral component, as well as for Husserl's concept of intersubjectivity, which stems from empathizing with others and from "putting yourself in someone else's shoes."

Regarding the biologically grounded urge to get connected to others, a great deal of evidence has accumulated recently due to studies in social neuroscience. Using an infant as an example, Matthew Lieberman says in *Social: Why Our Brains Are Wired to Connect*: "Food, water and shelter are not the most basic needs for an infant. Instead, being socially connected and cared for is paramount...Being socially connected is a need with a capital N...Love and belonging might seem like a convenience we can live without, but our biology is built to thirst for connection because it is linked to our most basic survival needs." (Lieberman 2013: 43)

The scope of Lieberman's argument is bounded by the desires of biological needs. The root of these desires is, ultimately, survival, and is based purely on the utility of being dependent

on others. From an evolutionary point of view, Lieberman explains that the brain is biologically evolved and trained tabula rasa to connect with other people. An evidence of the biological need to connect with others has been found by several studies using medical fMRI (functional magnetic resonance imaging), a technology that measures brain activity by detecting changes in the level of social pains and pleasures—such as being accepted or rejected, treated fairly or unfairly, or being respected or devalued by others (Eisenberger and Lieberman, 2004).

A recent study also shows that even “purified” reasoning is profoundly influenced by social emotions (Koscik et al., 2014). Other studies show that social emotions are, in turn, shaped by sensorimotor processes—actions—with others (Adolphs 2002; Adolphs 2003; Adolphs et al., 2002). Whether we are aware of it or not, we are constantly under the social influence.

These studies show that actions in a social situation lead to a common understanding, and thus, acting together serves as the key to realize intersubjectivity.

- 12) In phenomenology, essential intuition is properly called “eidetic intuition.” We use the term “essential intuition” to make the term more accessible to the readers.
- 13) According to Koch, human consciousness seeks diverse information from our brain, bodily senses, and the outside world. This implies that our consciousness is always looking outward, in pursuit of diverse information. Creatures with highly integrated brains are therefore better adapted to the world than creatures whose brains have the same number of neurons but are less integrated, Koch has concluded. A high level of integration allows the system to change its capabilities as a whole, but for the system to have a high level of integration, it must have a reasonable level of diversity as well. If all the constituting factors that make up our consciousness are identical, it will lead to stereotyped behavior, typically found in what Koch called a “zombie agent” (Koch 2012: 130).

The ability of essential intuition can be

explained by the amazing capacity of the brain, which can integrate a complex set information collected through action. Neuroscientist Christof Koch, who is researching human consciousness, has arrived at the realization that the human brain is part of a complex integrated system in which the brain, the body, and the world operate as a dynamic system (Koch 2012). The most important strength of human consciousness, as an integrated system, lies in the fact that the information associated with consciousness can be used for various purposes. “(Our consciousness has) the ability to combine data from different sensors to contemplate and plan a future course of action...(and) should be able to handle unexpected and novel situations,” writes Koch (2012: 129).

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