

IMAGINATION IN COGNITION: THE PURPOSE OF THE ARTS

Arthur D. Efland
The Ohio State University

The Problem and Purpose

In this paper I present a view of imagination from a cognitive perspective. Like feelings and emotions, imagination is one of those prickly topics with a history of exclusion from the realm of the cognitive. My purpose is to portray the role of imagination in cognition, to explore its potential for developing knowledge, understanding and culture, and raise questions about its purpose in education.

The paucity of psychological studies of imagination is not the result of oversight. It was widely discussed in literary and philosophical circles throughout the 19th century. Its neglect throughout most of the 20th century reflects the constraining influence of positivism, a legacy from which we have yet to shake ourselves free. Behaviorists avoided the study of mental imagery and imagination because they did not have access to the internal experiences and sensations of individuals other than through the documentation of subjective impressions (Gardner, 1985, p. 324).

Imagination in Philosophy.

For many years a bias ran through psychology which excluded mental imagery from the domain of the cognitive. Like Plato's bias against the arts, the imagination of the artist, (called by him inspiration) was suspect since artists were under the control of the muses and hence incapable of willing their own actions.¹ Lacking such control, artists could not be expected to have a knowledge of the source of their powers. They were merely instruments of the divine, not even to be regarded as the author of their creations. Genius was a gift from the gods - extra-human in origin!

By the seventeenth century Descartes established twenty-one rules for the direction of the mind as a defense against "the blundering constructions of the imagination" (Jones, 1952, pp. 662-663). Truth was neither to be found in the poetic allusions of literature nor in the fantasies of the visual arts, but in the certainties of logic, mathematics and geometry. Rationalism was thus born. A rationalist believed that the world consists of physical substances (bodies) and mental substances (minds), and that the rational mind, as a mental non-physical substance, was essentially disembodied.

Furthermore, the rationalist would say that what makes us human is our rationality which is of the mind, not the body. Reason may use the material provided by the senses, but it is not itself an attribute of bodily substance. If clear and distinct ideas could be formed about objects and events in nature, then these would likely reflect the structure of nature, herself. Nature is thus a rational world. In addition, the cognitive status of imagination is suspect since the images in the imagination have their origin in bodily and sensory encounters where they are subject to distortions and imperfections. Philosophers writing in the empiricist tradition, such as John Locke, were also wary of figurative speech as a devices that "are for nothing else but to insinuate wrong ideas, move the passions, and thereby mislead the judgment" (Lakoff & Johnson, 1980, p. 191).

By the end of the 18th century imagination fared somewhat better with Immanuel Kant recognizing it as a "productive faculty of cognition" (Kant in Hofstadter & Kuhns, 1964, p. 318). Using the faculty of imagination, the mind could create "another nature" from imagery given it by actual nature. Moreover, imagination could entertain. "When experience becomes too com-

monplace, we remold it." Kant also argued that imagination enables us to "feel our freedom from the laws of association that organize empirical experience, so that the material supplied by nature can be fashioned into something different, something which surpasses nature." Furthermore, imagination is creative; it brings intellectual ideas into movement, "thus enlivening the mind by opening it to the prospect of an illimitable field of kindred representations" (Kant in Hofstadter & Kuhns, 1964, p. 318)².

Kant's view of imagination was insightful yet, in his view, the "real work of cognition" still took place in the formation of concepts. Concepts are products of our understanding, which is formal and rule governed, whereas our perceptions are bodily, material, and passive³. (Johnson, 1987, p. xxviii). Later in this paper I adopt Mark Johnson's revision of the Kantian account of imagination. By placing imagination on a contemporary epistemological footing grounded in a view he calls "experiential realism", Johnson avoids the mind-body dualism Kant had inherited from Descartes and which plagued him.

By late 19th and early 20th centuries, positivism made war upon the artistic imagination since it operated without rules or apparent rational intent. Moreover, there was no way to verify the reliability of artistic insight. Depth psychologists like Freud and Jung, though less constrained by positivism, explored and charted the subconscious regions of the mind, but in delving into the psychological basis for feelings and emotions, widened the gulf between the cognitive and the affective, 20th century philosophers like Ernst Cassirer postulated that the recollection of past events, and the anticipation of future events made use of symbolic processes that require imagination for their realization. "Symbolic memory is the process by which man not only repeats his past experience but also reconstructs his experience. Imagination becomes a necessary element of true recollection" (Cassirer, 1944, p.75). In John Dewey's view, imagination is "the generous blending of interests at the point where the mind comes in contact with the world, when old and familiar things are made new in experience" (1934, p. 267). Yet imagination remained a closed book in the psychology of behaviorism which was dominant throughout the first half of the last century.

Psychological Studies of Mental Imagery

With the rise of the cognitive science perspective, the cognitive character of imagery and imagination became new candidates for psychological research, especially in work by Roger Shephard, Stephen Kosslyn and others (Shephard, 1978a; Shephard, 1978b; Kosslyn, 1980). In raising the issue of how to account for the existence of mental imagery, these psychologists began raising fundamental questions about the adequacy of computational models of mind first advanced in the cognitive sciences, and as a consequence their work has been a source of controversy (see Pylyshyn, 1973).

There have been three kinds of studies that have dealt with the topic of mental imagery: First, there has been compilations of anecdotal studies including self-reports of individuals whose significant scientific discoveries or artistic accomplishments were occasioned by strong acts of imaginative creativity. In particular, Shephard (1978a, 1978b) collected accounts of the imaginative activity of scientists. These provide dramatic portrayals of the role that mental imagery played in the thought processes that led these individuals to do their most important work, or make key discoveries.

Shephard cited Albert Einstein who reported that verbal processes did "not seem to play any role" in his processes of creative thought. In fact he maintained that his particular ability did not lie in mathematical calculation either, "but rather in *visualizing...effects, consequences and possibilities*". He performed what he called his *gedanken* or thought experiment where he imagined himself traveling alongside a beam of light at speeds of 186,000 miles per second. What he mentally "saw" did not correspond to anything "that could be experienced perceptually as light nor to anything described by Maxwell's equations, which described the relationships between the various forms of electromagnetic energy. It was these visualizations that prompted him to formulate the special theory of relativity" (Shephard, 1978a, 1978b).

A second approach to the study of mental imagery involved empirical studies, where the utilization of mental imagery was compared with ordinary perceptual activity (Shepherd and Metzler, 1971), or was contrasted with information presented in verbal, linguistic form (Kosslyn, 1983). Results obtained by Shephard and Metzler indicate that in many instances mental imagery is remarkably able to substitute for actual perception with subjects

seemingly able to make the same judgments about mental objects as they do about real objects encountered in perception. Johnson suggests that these studies of mental imagery offer empirical support for the presence of "image schemata" as a basis for imaginative thought (Johnson, 1987, p. 25). Kosslyn and his colleagues have also devised a comprehensive theory of what they call a "quasi-pictorial form of mental representation called imagery." According to Gardner, "this form of mental representation is as important for an understanding of cognition as is the more usually invoked propositional form" (Gardner, 1987, p. 327).

Kosslyn's position vis-a-vis "imagery" was contested by Zenon Pylyshyn (1973) and others⁴. Pylyshyn supports the view that cognition is principally a computational function denying any independent mental reality to imagery, claiming that "any mental image, schematic structure, or operation on them can be represented in propositional form" (cited in Johnson, 1987, p. 27). Johnson concedes that... of course we can describe images and schemata in propositional form, but the real issue concerns the cognitive reality of these in the first place. Gardner suggested, "the fact that computers can - and usually do - transmit information in only one symbolic form is no reason to assume that human beings do the same" (1987, p. 129) Indeed, his theory of multiple intelligences aggressively denies that limitation.

A third approach to the study of imagination is based on the linguistic work of George Lakoff who with Mark Johnson (1980) studied the cognitive foundations of such seemingly abstract mental activities as categorization and metaphor as observed in empirical studies of linguistic behavior. They maintain that there is a growing body of evidence for the existence of what they call "an image-schematic level of cognitive operations." Like Piagetian schemata these exist at a level of generality and abstraction that allows them to serve repeatedly as identifying patterns in a variety of experiences similarly structured in relevant ways. (Johnson, 1987 pp. 26-28). However, Lakoff and Johnson's (L&K) image schemata differ from Piagetian schemata in that they are structures based upon images derived "naturally"⁵ from bodily and perceptual experience. Piaget's schemata, by contrast, tend to give rise to symbolic structures based on propositional content. Later, I stress the similarities and differences between these two types of schemata, one providing the

basis for propositional structures of the mind (Piaget) while the other extends the cognitive to embrace nonpropositional structures of knowledge as well, with the latter providing a basis for imagination employing such devices as metaphor.

Categorization in Cognition

In what follows the groundwork is established for an a cognitive explanation of imagination. However, the reader might feel that it begins at some distance from the area of imagination since I begin with the topic of categorization. Categories in the formal sense are bound up with rules that define the conditions of membership or non membership of objects, events, or persons as the mind organizes and classifies these in like groups. In many ways these rules correspond with those of logical thinking and the operation of propositional forms of thought, which is not commonly regarded as fertile ground for the growth of imaginative thinking.

Categorization is also used in a second sense as when it refers to how people group things in the world of everyday, commonsense experience. Most people think of imagination in terms of the 19th century romantic definition - connoting artistic creativity, scientific discovery, invention, novelty and even day-dreaming. Such a definition has little to do with life in the everyday world, suggesting to tough-minded skeptics that it should have little to do with education, as well! In fact, Lakoff and Johnson were intent upon explaining how image schemata provide the foundation for such processes as, abstract reason, metaphor, narrative as components of the imaginative in cognition. Moreover, these occur across the whole gamut of human cognition - from life in the everyday world to the fine arts and the sciences.

We learn about the natural world through our senses, through the multiple sensations of sights and sounds, warmth and coolness, roughness and smoothness, tastes and smells. We also learn within a social world though mediations with family members, peers and the community at large. Our understanding emerges from these encounters. With experience our world picture becomes increasingly diverse and to control this vast enumeration of things, we organize it by categories, by samenesses and differences, friends and foes - even by likes and dislikes. It is the power to select - to include and

exclude. We organize our world on the basis of common attributes.

It is more efficient to learn about groups of things by their shared characteristics than by each in isolation. Categorization involves thinking about things in terms of commonalities, not about the uniqueness of individual cases. This action is mostly automatic and unconscious, giving rise to the view that objects and events in the world come in natural kinds. However, categories are cognitive achievements, not properties of the world as such. They emerge from the mind's effort to organize what is given in perception in its effort to secure meaning. Were it not for the capacity to categorize, we would soon become "slaves to the particular."⁶

Categories are also used to group things and people, and serve as a basis for social behavior. Jokes about women drivers or mother-in-laws assume that members of these groups share common (in these cases pejorative) characteristics. Such categories and their affective loadings are built into everyday language; they can disseminate sexist or racist stereotypes. These are negative applications of categorization. On the constructive side, the commonsense classification of birds, flowers and fish into groups of like things provides the basis for organizing knowledge used in everyday affairs and in the school curriculum.

Classical Categories and its Alternatives.

We tend to assume that the category groupings we form in our everyday affairs offer reliable representations of things as they are in the world, leading to a reliable view of reality, itself. Lakoff explains:

From the time of Aristotle to the later Wittgenstein categories were thought to be well understood and unproblematic. They were assumed to be abstract containers with things either inside or outside the category. Things were assumed to be in the same category if, and only if, they had certain properties in common, and the properties they had in common were taken as defining the category. (Lakoff, 1987, p. 6)

Wittgenstein's family resemblance categories. Yet, Ludwig Wittgenstein (1953) began realizing that people do not necessarily organize experience by

classical modes of categorization, that often they tend to devise alternative systems to circumvent the constraints imposed by such categories. He exemplified this with the concept. There is no single collection of properties that all games share, and thus it is impossible to devise a definition that includes all things called games that simultaneously excludes non-games. What unites games as a category is what Wittgenstein called family resemblance. According to Lakoff, "...games like family members are similar to one another in a wide variety of ways. That, and not a single, well-defined collection of common properties is what makes them a category" (Lakoff, 1987, p. 16). Moreover, people in everyday life are not troubled by this lack of a definition. We have no difficulty recognizing the objects and events called games.

Art as a category. In like fashion Morris Weitz (1956) argued that *art* as a concept also functions as a family-resemblance category, in that none of the existing definitions of art cover all cases of art. Art also has extendable boundaries as new media and styles come into being and as new works are created.⁷ When art was defined as formal order, the curriculum featured the study of formal principles stressing elements and principles of design, but when art was defined as the expression of the artist's feelings, creative self-expression was prevalent. When Weitz suggested that these definitions were, at best, argued for recommendations to view art from a particular vantage point, art educators began recognizing the possibility of multiple perspectives in the curriculum. This change from a traditional, classical conception of categorization to a family-resemblance system, began surfacing in proposals for eclectic curricula open to various ideas about what can be art.⁸

Prototype based categories. In classical theory categories share a collection of common properties possessed by all category members, where these attributes define the category. Consequently, no member of a set would have any special status (Lakoff, p. 40). Yet in the early 1970s Eleanor Rosch began identifying certain effects she called *prototype effects* within categories like *color, birds or chairs*. When people were asked to group colors that seem to belong together, they would put all the reds together, all the blues etc. But, if asked to select the best or most typical example of red or blue, most people could readily do that as well. These optimal color selections act like specific prototypes often based upon family resemblance by which individuals

mark their experiences of colors. Since prototypes suggest that some members of a group are more representative of the category than others, the idea of prototypes is at variance with classical theory where all cases should have the same standing as exemplars of the category.

Prototypes revealed another facet about categorization. Lakoff (1975) found that individuals use modifiers or "hedges" to circumvent the rigidity and inflexibility of classical categories. The expression "par-excellence" is one such hedge, while another is the expression "strictly speaking" as can be seen in the following example: For people living in the temperate zones of North America, the robin represents the prototype of the bird "par excellence," since it most nearly typifies the attributes of birds likely to be known there. On the other hand penguins or chickens are less likely to enjoy that status. "Strictly speaking" they are also birds but are less prototypical cases of the bird family. Thinking often has to shake off the mental straight-jackets imposed by categories.

Basic level categories. Akin to prototype based categories are what Roger Brown had earlier called "basic level" categories (Brown, 1958; 1965, pp.317-321). Like Rosch, he found that there are levels of membership within categories. To exemplify, when children learn about flowers as a category they may be involved in such actions as planting, picking and smelling the blossoms. At the same time they learn that they are called flowers, mentally establishing them as a class of living things. Later learning may add knowledge of more kinds of flowers, like roses and that flowering plants are members of a larger group called the plant kingdom. However, in this instance the basic level is that of flowers. Basic level categories seem to have the following characteristics as summarized by Lakoff:

- they are learned in conjunction with distinctive actions such as smelling flowers;
- they are learned earliest, when things are first named;
- they are at the level at which names are shortest or used most frequently;
- basic level categories are "natural" levels of categorization.

The "naturalness" of the basic level is attributed to physical bodily actions that are undertaken while the category is being established mentally (Lakoff,

1987, pp. 32-33).

According to Lakoff, with additional learning the category becomes more elaborate and proceeds upwards to form a "superordinate level" made up of generic categories. Thus, the plant kingdom becomes the all encompassing category that supersedes flowers. Categorization can also proceed downwards to form "subordinate" levels of categories e.g., the various varieties of roses, for example. Categorization at the sub and super levels are less likely to be learned in conjunction with natural actions, and for this reason these additional levels are what Brown called "achievements of the imagination" (Lakoff, 1987, pp. 32-33). They extend and elaborate the flower category. As a whole, the basic level of a category acts like Rosch's prototypes described above.

Some Implications.

Work on categorization in philosophy, linguistics, and psychology has challenged the classical conception of categories where the categories of the mind were thought to fit the categories of the world, where they operate like innate (a priori), formal ideas built into the mind. In his day Kant believed this was the case. Currently, it is becoming clear that categories are structures of knowledge abstracted from multiple experiences that are largely perceptual in character, and that they are "natural" in the sense that they arise from distinctive actions of the body such as grasping, touching, or seeing. And though abstract, they are not disembodied.

Second, Lakoff and Johnson (L&J) have observed and documented the fact that "the categories of our everyday thought are largely metaphorical and our everyday reasoning involves metaphorical entailments and inferences, [hence] ordinary rationality is imaginative by its very nature." (Lakoff and Johnson, 1980, p. 193). They add,

Metaphor is one of our most important tools for trying to comprehend partially what cannot be comprehended totally: our feelings, aesthetic experiences, moral practices, and spiritual awareness. These endeavors of the imagination are not devoid of rationality; since they use metaphor, they employ an imaginative rationality (Lakoff and Johnson, 1980, p. 193).

In their early work (L&J) they coauthored a book they call *Metaphors We Live By*, (1980) in which they began to elaborate a theory of knowledge that could account for the way the mind operates in circumventing the limits of formal categorization by developing "basic level" and "prototype categories" and by the creation of meaning through the use of metaphor. In the course of this work they have explored the role of image-schemata as a structure of knowledge that provides the foundation for a conception of cognition in which the imagination plays a pivotal role in developing the power of *categorization*, reason, prepositional and nonpropositional forms of thought through the application of metaphor and narrative.

All subjects utilize these forms of cognition though it is likely that prepositional reasoning is more likely to be experienced in philosophy, physics and mathematics than in the arts whereas it is principally in the arts where one encounters metaphor and imagination. When metaphor appears in the language of scientists, it is likely to remain hidden as seen in the illustration which follows: Notice that these statements rely on the metaphor that *theories are buildings*:

Is that the *foundation* for your theory ?

Quantum theory needs more *support*.

You'll never *construct* a *strong* theory on those assumptions.

I haven't figured out what *form* our theory will take.

Here are some more facts to *shore up* your theory.

Evolutionary theory won't *stand or fall* on the *strength* of that argument.

So far we have only put together a *framework* of the theory.

He *buttressed* the theory with *solid* arguments (Johnson, 1987, p. 104).

Each of these expressions are clear and unproblematic underscoring the point that the theory-are-buildings metaphor is meaningful. In fact, members of the scientific community would not likely discuss it as a metaphor!

The discussion of Marc Chagall that follows demonstrates how metaphor plays a different role in the arts.

Chagall's clocks. In several of Chagall's paintings done around the 1920s, a recurrent image is a winged clock that could be seen in flight. We know literally that clocks neither fly, nor do they have actual wings enabling them to do so. This is common-sense reality-based knowledge. Why then,

does this image appear in his paintings? Is the winged clock a reference to the folk metaphor *time flies*? Is it Chagall's way of commenting on the passage of time, perhaps his remembered youth in Russia? The winged clock also suggests that we are looking into a fantasy world in the artist's imagination, where natural laws are suspended. Some writers on Chagall have referred to the clock as being emblematic of the beating of the human heart, the ticking away of life. There is no way to be sure which of these interpretive conjectures is tenable.

For this reason such works of art open what David Perkins calls a "reflective intelligence" (Perkins, 1994). The winged clock has become an object for thought, for interpretation. The metaphor is active. It enlivens cognitive activity. The point of these illustrations is to show that metaphors are likely to work covertly in scientific discussions while in the arts they are active.

Cognitive Structures in Piaget's Theory of Development

L&J's concept of *image schema* underlies the basis for their theory. However, to understand this concept, I compare it with Jean Piaget's concept of the schema. Schemata are not new in theories of cognitive development and have been a principle object of investigation by Piaget and others. For Piaget, cognitive development begins when infants begin to recognize certain regularities in their experience. Increasingly, they come to rely on the memory of prior encounters, the actions which initiated them and the resulting responses as providing a reasonable guide for future actions. Piaget attributed the growth of this ability to the formation of specific cognitive structures called schemata. He used this concept to help explain why individuals develop relatively stable, even predictable responses to stimuli. Schemata are symbolic structures that organize events perceived by the mind. They are abstract structures that summarize information from many different cases, but tied to these structures is the awareness of particular operations or actions undertaken by the mind to understand what is given in perception. Piaget describes the development of these cognitive structures as becoming increasingly mentalistic, abstract, and less dependent upon the senses. Their cognitive operations become less physical and more formal as the organism matures. Cognitive development also precedes through several stages

marked by changes in these structures. In his "formal operations" stage, Piaget describes the mind's power to organize symbolic structures in logical and scientific propositions that describe, explain, and reliably predict events in nature. Schemata as conceived by Piaget evolve into logical, scientific and propositional structures. His main work consisted of tracking the evolution of these structures from the first actions undertaken by the infant, like the grasping of objects, to the formation of abstract symbolic structures, comprised of numbers and letters which, though meaningless in themselves, are understood as representations of the actual world.

Piaget did *not* discuss the possibility that schemata might take the form of mental imagery resulting from perception. Indeed, he did not regard perception as a form of intelligence, but rather defined it in terms of the actions or operations the mind takes on its perceptions in order to understand them (Flavell, 1963, pp. 31-33).

The function of cognitive development in the Piagetian view was not to produce intellectual understandings that offer a more reliable view of reality "but to produce more and more powerful logical structures that permit the individual to act upon the world in more flexible and complex ways." Flavell's description of Piaget's schemata also describe these structures, as kinds of concepts, categories, or underlying strategies which group together a collection of distinct but similar actions (1963, pp. 54-55). Of importance is that these structures in their early phases include sequences of actions undertaken by the infant to explore and understand its environment.

Lakoff and Johnson's Image Schemata.

Though L&K do not discuss Piaget directly, their philosophical explorations and work in linguistics attempts to characterize meaning in terms of *embodiment*, that is: in terms of pre-conceptual, bodily experiences (Lakoff, 1987, p. 267). They postulate a kind of schema that begins with images and bodily experiences acquired directly in perception⁹ as providing the foundation for categorization, abstract reason, propositional and nonpropositional forms of thinking, metaphor, and narrative. Meaning is embodied directly in the percepts acquired in experience and does not have to await additional actions put forth by the mind to comprehend its experience. Johnson exemplifies this

with the image schema of *balance* as giving rise to a structure that applies to many instances of *balanced* phenomena. Initially, balance acquires meaning through experiences where we orient ourselves physically within our environment. We live in a gravitational field and resist the pull of gravity as we learn to maintain our equilibrium He writes:

It is crucially important that we see that balancing is an *activity* that we *learn* with *our bodies* and not by grasping a set of rules or concepts. First and foremost balancing is something we do. The baby stands, wobbles, and drops to the floor. It tries again, and again, until a new world opens up - the world of balanced erect posture (Johnson, 1987, p. 74).

The image schema of balance is acquired by activities like learning to stand and walk, experiences which are learned in the course of development often before there are words to name or describe them, hence their non-propositional character. Once established they are potentially available for metaphorical elaboration so that balance can refer to such things as a balanced personality, a balanced equation in mathematics, the balance of justice in the workings of the legal system, etc.

In the case of *balance*, for example, we saw how certain very abstract concepts, events, states, institutions, and principles (such as psychological states, arguments, moral rights, and *mathematical* operations) are metaphorically structured as entities or physical events. And it is by virtue of metaphorically imposed structure that we can understand and reason about the relevant abstract entities. It is the projection of such structure that I am identifying as the creative function of metaphor, for it is one of the chief ways we can generate structure in our experience in a way we can comprehend (Johnson, 1987, p. 98).

Metaphoric Projection.

L&K claim further that higher order, rational thinking can be accounted for through extensions of these image schematic structures by *metaphoric projection*. The existence of these structures of imagination not only sug-

gests that imagination is cognitive but is likely the foundation of cognition. To understand the nature of these structures and their actions, I describe the structure of metaphor as posited by Lakoff.

For Lakoff a metaphor must have three parts: a source domain, a target domain, and a source to target mapping (1987, p. 276). To understand the metaphor we would have to see how these elements are intellectually connected to each other. In many of L&J's examples, the source domain is usually grounded in some aspect of pre-conceptual, or basic level bodily experience. Lakoff illustrates this with a metaphor based upon the image schema he calls "more-is-up, less-is-down." This is seen in expressions like, "The crime rate keeps *rising*," "The number of books published each year keeps *going up*," "That stock has *fallen* again" (Lakoff, 1987, pp. 276-277). In each example the source domain is verticality while the target domain is quantity. Verticality serves as a good source domain since it is directly understood in our bodily experience of gravity. *More* is understood as *up* because "...whenever we add more of a substance say water to a glass - the level goes up. When we add more objects to a pile, its level rises. Remove objects from the pile or water from the glass and the level goes down." Thus, verticality and quantity become linked together through common structural correlations that permit verticality to represent quantity. Lakoff concludes:

...schemas that structure our bodily experience *pre-conceptually* have a basic logic. Pre-conceptual structural correlations in experience motivate metaphors that map that logic onto abstract domains. Thus what has been called abstract reason has a bodily basis in our everyday physical functioning. It allows us to base a theory of meaning and rationality on aspects of bodily functioning (Lakoff, 1987, p. 278).

Metaphors establish connections among objects and events that are seemingly unrelated, and they are encountered in all studies as well as the arts. Metaphoric projection is the means through which abstract thought arises. This is important because it explains how abstract thinking in human cognition can emerge from bodily and sensory experience. Lakoff and Johnson's main claim is that image-schemata, which emerge from bodily sensations and perceptions, can reach the mental, epistemic, or logical domains in cog-

nition. What is typically referred to as higher order thinking, the larger understandings that are called abstract and disembodied reason, have their beginnings with the formation of image schemata in bodily experience.

In particular, Johnson described *image schemata* as nonpropositional structures of imagination, a concept he derived from Kant's *Critique of Pure Reason*. Kant elaborated a theory of imagination based on four divisions, called *reproductive imagination*, *productive imagination*, *imagination as a schematizing function*, and finally *creative imagination* (Kant, 1997, pp 273-274). Johnson's work is derived mainly from his interpretation of imagination where schematizing plays the pivotal role. Image schemata are further described as "embodied patterns of meaningfully organized experience" e.g., structures of bodily movements and perceptual interactions.

It is here where differences between Johnson and Piaget arise, in that for Piaget *actions are operations of the mind* that work on the perceptions it receives as opposed to *actions of the body* like learning to walk. Since Piaget's schemata are of the mind; they lead to the formation of propositional structures, whereas the image schemata of interest to Johnson, are *of the body*, though in Johnson's metaphysical conception the body and mind are undivided.¹⁰ Though Piaget's understanding of the cognitive was more dynamic than the Kantian view with its innate mental structures, it still tended to portray the course of development as journey away from the sensory foundations of knowledge. Despite his early training as a biologist he, like Kant before him, conceived of the mind's formal operations as being less dependent if not entirely separate from the body.

By contrast, Johnson and Lakoff's intellectual journey reveals a basic level of bodily and perceptual experience as the foundation of cognition and the source of meaning. Like Piaget they also sought to provide an alternative to the Kantian view that higher-order logical structures emerge "a priori as the universal essence of rationality" (Johnson, p. 99), and argue that such higher-order cognitive structures emerge from our embodied, concrete experience. They extend the definition of cognition to include traditional propositional schemata Piaget but also include image-schematic, nonpropositional structures.

The Kantian conception of imagination was problematic because it divid-

ed the mind into a physical or material side governed by strict deterministic natural laws, which included our bodily being, including sensations, and feelings, while on the other side of the mind, was the formal realm of the understanding. This gulf separated understanding from perceptual experience, the mind from the body in a dualism that went back to the rationalism of Descartes, and which survives in Piaget's tendency to separate thinking from feeling. However, schematic imagination as conceived by Kant had the potential to bridge this gap. Johnson adds:

I would suggest that though Kant could never admit it, that his remarkable account of imagination actually undermines the rigid dichotomies that define his system, showing very powerfully that they are not absolute metaphysical and epistemological separations. Hence imagination is a pervasive structuring activity by means of which we achieve coherent, patterned, and unified representations. The conclusion ought to be, therefore, that imagination is absolutely essential to rationality, that is, to our rational capacity to find significant connections, to draw inferences, and to solve problems. Kant, of course, pulls back from this conclusion because it would undermine the dichotomies that underlie his system (Johnson, 1987, p. 168).

Kant's problem disappears when we deny the alleged gap between understanding, imagination, and sensation. Johnson asks, "what if, following the consensus of contemporary analytic philosophy, we deny the strict separation of the formal realm from the material?" If we were to regard these as poles on a continuum, there would be no need to exclude imagination from the cognitive. Kant recognized a vast realm of shared meaning structure in imagination but could not bring himself to grant this dimension cognitive status.

Toward a Theory of Imagination

Johnson suggested that "an adequate account of meaning and rationality (as well as of understanding and communication) awaits a comprehensive theory of imagination. Such a theory would complement and influence our present

theories of conceptualization, propositional content, and speech acts. In its broadest sense, it would provide a comprehensive account of structure in human experience and cognition (1987, p. 171). He then listed several features of what a cognitive account of imagination would entail some of which are listed below:

Categorization. By this he means not the classical view of categorization but a view that describes the way human beings actually "break up their experience into comprehensible kinds." Prototypical categorization is preferred over types that seek sets of necessary and sufficient conditions (p.171).

Schemata. He cites the need for a comprehensive theory of schemata, i.e., "general knowledge or event structures. We need to survey the basic kinds of schemata, to see how they can be developed metaphorically, to investigate their complex interrelations, and to explore their connections with propositional structures" (p.171).

Narrative structure. When it comes to explaining how humans make sense of their world "there must be a central place for the notion of narrative unity. Not only are we born into complex and communal narratives, we also experience, understand, and order our lives as stories we are living out" (pp. 171-172).

Interpretations as Narratives.

Although Johnson identifies the structure of narrative as one of the components in a comprehensive theory of imagination (1987, pp. 171-172) he does not elaborate how the capacity for narrative is related to other features of imagination such as metaphor. But narrative structure does share certain common features with metaphoric structure, in that they have a source point in human experience where they originate with some kind of problem or situation. Jerome Bruner uses the term "trouble" to identify the starting points in many narratives (Bruner, 1996). A typical narrative will open with a phrase like:

"I was walking down the street, minding my own business when..."
The action unfolds leading to a breach, a violation of legitimate expectancy. What follows is either a restitution of initial legitimacy or

a revolutionary change of affairs with a new order of legitimacy (Bruner, 1996, p. 94).

There is also a target point (some kind of resolution, outcome, or moral of the story), and finally there are pathways that map the intervening connections.

Narrative in Bruner's view is also a disciplined mode of thought for constructing the present, past and possible human conditions (Bruner, 1996, p. 100). Narratives don't provide explanations, but rather, lead to understanding, which is defined as "the outcome of organizing and contextualizing essentially contestable, incompletely verifiable propositions in a disciplined way" (p. 90). The narrative mode of meaning-making tells us a story of what something is about. "Understanding, unlike explaining, is not preemptive. One way of constructing the fall of Rome narratively does not rule out other interpretations." "Some narratives about 'what happened' are simply righter, not just because they are rooted in factuality, but because they are better contextualized, rhetorically more 'fair minded' and so on" (pp. 90-91).

Bruner also identified the broad implications of narrative in education, decrying the tendency in schooling to treat them as mere decoration rather than a way, perhaps the best way, for individuals to construct meaning.

It has been the convention of most schools to treat the arts of narrative - song, drama, fiction, theatre, whatever - as more "decoration" than necessity, something with which to grace leisure... Despite that, we frame the accounts of our cultural origins and our most cherished beliefs in story form... Our immediate experience, what happened yesterday or the day before, is framed in the same storied way. Even more striking, we represent our lives (to ourselves as well as to others) in the form of narrative (p. 40).

The importance of narrative for the cohesion of culture is as great very likely, as it is in structuring an individual life... "trouble narratives" appear again in mythic literature and contemporary novels, better contained in that form than in reasoned and logically coherent propositions. It seems evident, then, that skill in narrative construction and narrative understanding is crucial to constructing our lives and a "place" for ourselves in the possible world we will

encounter (p. 40).

Relevance to Art Education

For most people the term imagination "connotes artistic creativity, fantasy, scientific discovery, invention and novelty" - having little or no correspondence to the everyday world of occurrences. Such beliefs are holdovers from 19th century romanticism. Johnson was intent upon explaining that image schemata, metaphor, and narrative as components of the imaginative in cognition operate across the whole gamut of human cognition and, as such, are not limited to the arts.

But since he so thoroughly implicates imagination as the quintessential component of higher forms of cognition including abstract reason, it has unmistakable implications for the arts as well, as places where metaphoric leaps of imagination are prized for their power and aesthetic excellence. Moreover, in the arts, the experience, nature, and structure of imagination should become the principle object of study. This happens in activities where individuals create works of art but imagination comes into play in the interpretation of works of art as well. Deepening the wellspring of the imagination and the role it can play in the creation of personal meaning and in the transmission of culture becomes the point and purpose for having the arts in education.

Making a place for the arts neither means giving oneself over to the ornamental fringes of knowledge nor to the abandonment of the hard facts of reality. Indeed, quite the reverse is true. For example, before a metaphor can become active in the learner's mind - *as a metaphor!* - he or she must understand the underlying reality or context where the metaphorical nature of the image or expression is active.

Let me emphasize this point once more that the arts are places where the constructions of the imagination can and should become the principle object of study, where it is necessary to understand that the visual image or verbal expression are not literal facts, but are embodiments of meanings to be taken in some other light. It is *only in the arts where the imagination is encountered and explored in full consciousness* - where it becomes the object of inquiry. As it exists in the sciences it is likely to remain hidden.

Having learners understand the imaginative as ornamental devices like metaphor, used mainly by artists and poets, is of secondary importance. I lean more toward activities where the learner comes to an understanding of the world referred to in works of art, and the role that the artist's imagination plays in constructing that world and giving it meaning. Moreover, an art education that fails to recognize the metaphoric character of meanings in the arts is without serious educational purpose.

Implications for General Education.

Cognition entails more than meaning stated in propositional forms; it takes nonpropositional forms as well. Yet schooling for most students occurs within a curriculum where knowledge is experienced as a series of isolated, random facts. This compartmentalized curriculum reflects a long tradition in Western philosophy, which in large part is the consequence of a divided mind. On one side is cognition proper, the province of reason, conceptualization, logic and formal propositional discourse. On the other is the bodily, perceptual, material, emotional and imaginative side of our nature.

"The most significant consequence of this split is that all meaning, logical connection, conceptualization and reasoning are aligned with the mental or rational dimension, while perception, imagination and feeling are aligned with the bodily dimension. As a result both nonpropositional and figuratively elaborated structures of experience are regarded as having no place in meaning and the drawing of rational inferences." (Johnson, 1987, p. xxv)

These polarities have reified themselves into structures of consciousness. If thinking is cognitive, then its contrary, (feeling), is noncognitive. If cognition involves the use of verbal and mathematical symbols to construct rational or formal propositions, then perceptual imagery is taken to be nonpropositional and hence noncognitive. This schism relegates half of mental life to the lesser realm of affect.

Moreover, this structure of belief has become the structure of the curriculum. Science was placed in the cognitive domain while the arts were dispatched to the domain of feelings and emotions. To be sure the arts were

highly praised as sources of wonderment, amusement, delight, as embellishment or beautification - (icing on the cake), but rarely were they taken to be active sources of insight, knowledge, or understanding. Education should have as its ultimate purpose the maximization of the cognitive potential of individuals through the use of the imagination - in all subjects to be sure but certainly in the arts.

The arts are educationally important when they equip individuals with the relevant tools to fashion their lifeworlds. The tools or cognitive strategies that are entailed in this learning process include imagination as a schematizing function, and its extensions by metaphoric projection. Metaphor, in particular, constructs linkages that enable us to understand and structure one domain of knowledge in terms of the knowledge in a different domain, thus to establish connections among seemingly unrelated things. The subjects which give play to these aspects of cognition should lie at the core of the curriculum where they can become bases for understanding.

We may have multiple forms of cognizing (propositional vs. nonpropositional) but in my view these do not stand in opposition to each other. Rather, both emerge from the same common source, the basic level of experience originating in bodily and perceptual encounters with the environment including culture. The reason why the hunches of the scientist or the imagination of the artist can be intuitive is that they reach an undivided world, the world that the physicist David Bohm calls "the implicate order," a world beyond dualisms that divide the body from the mind, thinking from feeling, or individuals from their social world. The building of lifeworlds requires access to such sources as represented and extended symbolically in thinking, feeling, and willed action. Such building is, in the final analysis, an "achievement of the imagination."

References

- Brown, R. (1958). "How shall a thing be called?" *Psychological Review*. 65: 14-21.
- Brown, R. (1965). *Social psychology*. New York: Free Press.
- Bruner, J. (1996). *The culture of education*. Cambridge, MA: Harvard University Press.
- Cassirer, E. (1944). *An essay on man: Introduction to a philosophy of human culture*. Garden City, NY : Doubleday & Co, p. 75.
- Flavell, J. H. (1963). *The developmental psychology of Jean Piaget*. Rinceton, NJ: D. Van Nostrand Co, Inc.
- Gardner, H. (1987). *The mind's new science: A history of the cognitive revolution*. New York: Basic Books, (originally published in 1984).
- Gruber, H. E. & Voneche, J. J. (1981). *The essential Piaget*. London: Routledge & Kegan Paul.
- Jones, W.T., (1952). *A history of western philosophy*. Vol.2. New York: Harcourt, Brace & Co.
- Lakoff. G. (1975). "Hedges: a study in meaning criteria and the logic of fuzzy concepts." PP. 221-271 in D. Hockney et.al., eds., *Contemporary research in philosophical logic and linguistic semantics*. Dordrecht: D. Reidel.
- Lakoff, G. & Johnson, M. (1980). *Metaphors we live by*. Chicago: University of Chicago Press.
- Lakoff, G. (1987). *Women, fire and dangerous things: What categories reveal about the mind*. Chicago: University of Chicago Press.
- Johnson, M. (1987). *The body in the mind: The bodily basis of meaning, imagination and reason*. Chicago: University of Chicago Press.
- Kant, I. (1997). *Critique of pure reason*. P. Guyer and A. Wood (trans. & eds.). New York: Cambridge University Press.
- Kant, I, *Critique of the Aesthetical Judgment* in Hofstadter, A. & Kuhns, R., (Eds.). (1964). *Philosophies of art and beauty*. New York: Modern Library, p. 318.
- Kosslyn, S. (1980). *Image and mind*. Cambridge, MA: Harvard University Press.

- Kosslyn, S. (1983). *Ghosts in the mind's machine: Creating and using images in the brain*. New York: W. W. Norton.
- Pylyshyn, Z. (1973). "What the mind's eye tells the mind's brain: A critique of mental imagery." *Psychological Bulletin*, 8, 1-14.
- Shephard, R. N. & Metzler, J. (1971). "Mental rotation of three dimensional objects." *Science*, 171, 701-703.
- Shephard, R. (1978a February). The mental image. *American Psychologist*, 125-137.
- Shephard, R. (1978b). Externalization of mental images and the act of creation. In B.S. Randhawa & W. E. Coffman (Eds.), *Visual learning, thinking and communication*. New York: Academic Press.
- Weitz, M. (1956). The role of theory in aesthetics. *Journal of Aesthetics and Art Criticism*, 15, 27-35.
- Wittgenstein, L. (1953). *Philosophical Investigations*. New York: Macmillan Co.

-
1. Plato's attack of the doctrine of inspiration appeared in the dialogue known as *The Ion*. He also opposed the reliability of art as a source of knowledge in *The Republic* because a work of art is a double imitation, i.e., an imitation of an imitation. There was also a third argument against the arts, namely that such works violate public decorum by arousing socially unacceptable passions.
 2. These statements on imagination were taken from Kant's later work *The Critique of Judgment*. The structure of imagination is given in the *Critique of Pure Reason*.
 3. The senses were thought to be passive since they are receivers of sensations. Whereas the mind was thought to be active in its knowledge-seeking.
 4. A detailed account of this controversy can be found in Gardner, H. (1987) *The mind's New Science: A History of the Cognitive Revolution*.
 5. The term "natural" was coined by George Lakoff to refer to images derived directly from the senses as opposed to experiences mediated by verbal or other forms of symbolic representations. See p. 27 in Johnson's, (1987). *The Body in the Mind*.
 6. I attribute the expression to Jerome Bruner.
 7. Answers to the question, "what is art?" were traditionally thought to be true defini-

tions, in the sense that they were advanced as covering all cases of art. Weitz argued that "what is art?" is the wrong question, that a more appropriate one would ask "what sort of concept is art?" or how is it being applied in a given context?

8. For example, Laura Chapman's widely used text *Approaches to Art Education* adopted an eclectic stance. My "Conceptions of Teaching" paper traced a succession of orientations in art education that were prominent throughout the twentieth century.
9. Image schemata should not be confused with the images we recall from prior perceptions. Rather they are structures that be common in various remembered images. Johnson exemplifies with one he calls "compulsive force" in which structural similarities between a jet airplane being forced down the runway, forces acting upon continental plates, and (metaphorically) being forced by to join the PTA. are found to be similar.
10. Both Lakoff and Johnson reject what they term the myths of objectivism and subjectivism in favor a metaphysics they call experiential realism. See Chapter 11 in Lakoff's *Women, Fire and Dangerous Things*. See also Chapters 25 to 28 in Lakoff and Johnson's *Metaphors We Live By*.

從認知中的想像論藝術的意義

亞瑟·艾弗蘭

美國俄亥俄州立大學

問題與目的

本文從「認知」的角度，提出我對「想像」的看法。就和感覺情緒一樣，「想像」這個棘手的問題一直不在「認知」討論的範圍，因此本文的目的即在說明「想像」在「認知」中所扮演的角色，討論「想像」是否能夠幫助我們追求知識、智慧和修養，以及「想像」在教育中有何重要性。

心理學中少見對「想像」的研究並非疏忽所致，其實十九世紀近百年間，「想像」是文人及哲學家經常討論的話題，後來實證主義興起，才導致「想像」在二十世紀飽受冷落，而實證主義的影響到今日仍未曾稍減。行為學派的心理學家始終避談心象與想像，因為除了記錄個人主觀的陳述之外，沒有其他的管道能夠了解內在的經驗及感覺。(Gardner, 1985, P. 324)

哲學界眼中的「想像」

長久以來，整個哲學界充斥著一種偏見，將心象排除在認知的範圍之外，如柏拉圖除了貶斥藝術，也不相信藝術家的想像力（在他口中稱為靈感），他認為藝術掌握在繆思手中，而藝術家只是被動的接受，不可能確實了解創造力的源頭，藝術家不過為神人所用，甚至不足以稱為「創作者」，天分乃是「天」賜，絕非源於人類自身。

到了十七世紀，笛卡兒提出二十一條修心準則，以免「想像力亂搞一通」

(Jones, 1952, PP. 662-663)。真理不存在於文學的指涉或藝術的想像，而在於邏輯、數學、幾何之必然，理性主義於焉誕生。理性主義者認為，世界由兩種物質構成，分別為實體的物質（身體）和心理的物質（心智），而人的理性屬於心理的物質，當然不具形體。

理性主義者又進一步指出，人之所以為人所仰賴的理性，屬於心理而非身體的一部份，理性雖然必須依靠感官所提供的資料作判斷，但是它本身並不屬於身體，自然界的事和物都可以化為明確的概念，就表示自然界在結構上是一個理性的世界。「想像」在認知中所扮演的角色另一個受到質疑的地方，在於想像時所運用的心象來自身體感官的知覺，所以可能扭曲、可能失真。經驗主義派哲學家如洛克(John Locke)就曾經警告說：「比喻唯一的目的就是讓人不知不覺產生錯誤的觀念，使人感情用事，最後做出錯誤的決定。」(Locke in Lakoff & Johnson, 1980, P. 191)

到了十八世紀末「想像」的地位稍有提升，康德提出想像是「認知中一項有用的能力」(Kant in Hofstadter & Kuhns, 1964, P. 318)。如果善加利用，從自然界中經驗到的圖像就能在人的內心產生新的生命。另外，想像也能夠帶來樂趣，「人的經驗日復一日變得乏味之後，可以藉由想像讓經驗改頭換面。」康德認為想像使人能夠擺脫實際經驗中的聯想法則，如此我們得自自然界的感受經驗就能轉化為凌駕「本尊」、更具新意的「分身」。想像還具有「創造」的成分，能夠將靜態的念頭化為連續的、有生命的思考，「讓人的心智活潑起來，看到一片一望無際的原野，放眼盡是聯想和比喻。」(Kant in Hofstadter & Kuhns, 1964, P. 318)

康德對「想像」的探討見解深刻，但他仍然認為「真正的認知」只出現在形成概念的過程；概念是大腦理解事物之後的產物，具有一定的形式、規則；相對的，知覺則有賴於身體感官、具體的事物，而且過程中人是被動的接受者(Johnson, 1987, P. xxviii)。下文我採用馬克·強森(Mark Johnson)對想像的定義，他對康德的看法稍作修正，從他所謂「經驗寫實主義」的現代認識論觀點來討論「想像」，避開笛卡兒以降一直到康德的身心二元論這個敗筆。十九世紀末、二十世紀初，實證主義痛加撻伐藝術的想像，因為藝術的想像既無規則可循，也沒有理性的訴求，更重要的是靈感究竟存不存在也不可考。研究無意識的心理學家，例如佛洛伊德和容格，開始跳脫實證主義的限制，研究人的潛意識，但是他們探討感覺情緒的心理基礎，卻擴大了

「認知」和「情意」之間的鴻溝。二十世紀的哲學家如恩司特·凱西爾(Ernst Cassirer)，認為人要回想過去的事件、預期未來的事件，過程中需要用到許多的象徵，而這些象徵又需要「想像」方能形成，他說：「透過象徵的記憶，人不僅能回顧甚至重塑過去的經驗，想像因此成爲真正的回憶不可或缺的要害。」另外，杜威則認爲想像是「人的內心接觸外在世界時，各種念頭最徹底的融合，將舊有的經驗賦予新的意義(1934, P. 267)。」但是對於二十世紀前半獨立風騷的行爲學派來說，想像一直是一個未解的謎。

心理學家眼中的心象

隨著認知科學觀點的興起，心象和想像有無認知特性也成了心理學研究的新議題，其中較著名的學者包括羅傑·雪柏(Roger Shephard)、史蒂芬·柯司林(Stephen Kosslyn)等人(Shephard, 1978a; Shephard, 1978b; Kosslyn, 1980)，爲了解釋心象的存在，這些心理學家質疑認知科學中將心智運作比擬爲機器的觀點，而他們的質疑也同樣引起許多爭議(Pylyshyn, 1973)。

到目前爲止，研究心象的方式有三種，第一種是收集以創意著稱的科學家及藝術家的自白，加以整理研究，其中雪柏(1978a, 1978b)收集了許多科學家對自身想像活動的陳述，當事人明白指出心象在其思考過程中的重要地位，聲稱心象是促成重要作品或發現的一大助力。雪柏以愛因斯坦爲例，愛因斯坦曾表示他在思考時很少用到語言，他的特長甚至不在數學能力，而是能夠「將…影響、後果和可能的發展視覺化」，透過他所謂的「思維實驗」想像自己以光速前進，他在腦海中所「看」到的既不是一般的光，也不同于麥克斯韋方程式中的電磁能量；他所看到的這些心象，最後形成了著名的相對論(Shephard, 1978a; 1978b)。

第二種研究心象的方式和經驗主義有關，這種方法將心象和尋常的感官活動做比較，或將心象和文字、口語形式的資料做對比(Kosslyn, 1983)，結果發現心象往往可以取代真實的知覺，受試者對心中想像的物體和對真實的物體似乎有著相同的反應。強森認爲這些結果足以佐證「心象基模」是想像的基礎(Johnson, 1987, P. 25)。柯司林等人另外提出一套完整的理論，所謂的「準圖像式內心呈現」，也就是心象；而照賈德納(H.Gardner)的說法，「在認知的研究上，心象的重要性並不亞於較爲人知的命題形式(propositional form)。」

柯司林對心象的立場，受到基能·比利辛(Zenon Pylyshyn)等人的質疑，比利辛認為認知基本上是機械式的功能，否認心象是獨立的心理能力，他還宣稱所有的心象和基模結構的運作，都可以化為清楚的文字敘述。強森

承認這一點是可以做得到，但他也強調最重要的是心象基模的確存在於認知中；賈德納指出，電腦只有一種「思考」形式，並不代表人腦也必然如此(1987, P. 129)，他的「多重智力」理論就非常強調這一點。

第三種方式是根據喬治·拉可夫(George Lakoff)所做的語言學研究，他與強森合作，觀察實際的語言行為中看似抽象的活動，例如分類和比喻，研究其認知基礎，他們主張愈來愈多的證據顯示他們所謂的「心象基模層次的認知活動」是存在的。和皮亞傑提出的基模一樣，「心象基模層次的認知活動」也具有概化、抽象的特性，因此在類似的情境中可以一再援引為辨認的標準(Johnson, 1987, PP. 26-28)。然而，兩者也有不同的地方，拉、強兩人的基模來自於身體感官「自然」產生的心象，而皮亞傑則認為基模是根據命題而產生的象徵結構，下文我會特別比較兩種基模的異同，皮亞傑的基模是心智中命題結構的基礎，而拉、強兩人則擴大了認知的範圍，納入命題結構以外的知識，他們的基模乃是想像的基礎。

認知中的「分類」

接下來，我要說明「想像」具有認知的特色，然而各位讀者也許會覺得我有一點離題，因為我首先要談的是分類。「分類」正式的定義是根據一定的規則，判斷某人、事、物屬於或不屬於某個「類別」，而這些規則往往就相當於邏輯思考和思維命題形式的原則，一般認為無助於培養想像力。

其次，「分類」也可以指日常生活中一般人所做的判斷。談到「想像」，大多數人還停留在十九世紀浪漫主義的解釋—藝術創作、科學突破、新發明、新奇的事物甚至做白日夢，這樣的定義和日常生活的關係不大，於是徹底的懷疑論者就認為「分類」在教育上也不會有什麼用。其實拉、強兩人意圖證實抽象思考、比喻、敘事這些認知中的想像成分，其基礎便是心象基模，而且這些想像成分應用範圍極廣，從日常生活、精緻藝術到科學，涵蓋所有的認知活動。

我們透過感官認識自然世界，例如視覺、聽覺、觸覺、嗅覺和味覺，也透過與親友及其他人的互動，認識人文的世界；我們的了解就來自這些經

驗，隨著經驗累積，我們對世界的認識也漸趨複雜多元，最後爲了便於管理，必須區分出類別、異同、敵友、甚至好惡。這是一種選擇的能力，判斷應該包括或排除，根據事物共通的特性來組織週遭的世界。

事物的共通性讓學習更有效率，不須一樣樣東西分開來記，分類著眼於事物的共通之處而非其獨特性，這種過程往往是自發而無意識的，因此讓人誤以爲世上的事物本來就有類別。其實類別是認知運作的結果，不是世界本然的特性，人爲了掌握意義，刻意將知覺組織分類，也幸虧人有這種能力，才不會變成「獨特性的奴隸」。

類別也用於區分人、事、物，做爲社會行爲的基準，例如有關於女人開車或丈母娘的笑話，就是認定女人（和丈母娘）都有共同的特性（在這個例子是負面的特性）。這些類別、成見深植在日常的語言當中，甚至散播性別或種族的歧視，這是分類負面的應用。但是分類若用在正途上，例如區分不同的花、鳥、魚，則有助於組織日常生活和學校課程中用到的各種知識。

傳統類別與其他

我們都以爲我們對日常事物所做的分類，必然吻合真實的情形，由此建立一個可靠的現實。正如拉可夫所說：

從亞里斯多德到維特根斯坦，世人一直認爲類別人人都了解，毫無爭議，類別是抽象的界線，事物不是在界線內就是在界線外，而同一個類別的事物必然具有共通的特性，這些共通的特性也正是這個類別的定義(Lakoff, 1987, P. 6)。

維特根斯坦的家族式類別——然而維特根斯坦(Ludwig Wittgenstein) 1953發現，我們組織經驗時，並不一定遵循傳統的分類方式，而往往會創造新的類別，以免受傳統的類別所限制。他以「遊戲」這個概念爲例，如果問世界上各種遊戲有什麼共通的特色，誰也答不出來，沒有一個單一的定義能夠界定什麼是遊戲、什麼不是遊戲；「遊戲」之所以成爲一種類別，是基於維特根斯坦所謂的「家族特色」。拉可夫也指出：「各種遊戲彼此之間，就和親人一樣具有各種不同的相似之處，這些爲數衆多的共通性形成『遊戲』這個類別，而沒有單一、明確的定義。」(Lakoff, 1987, P. 16)此外，沒有單一的定義，對我們的日常生活毫無影響，看到遊戲誰都認得出來。

藝術之為一種類別——同樣地，摩里斯·懷茲(Morris Weitz)1956認為藝術這個概念也是一種「家族式類別」，因為現有的藝術的定義，都無法包含所有的藝術形式，而且各種媒材、風格和作品不斷推陳出新。如果將藝術定義為一種形式，則藝術教育強調的是設計的要素與原則，但是若將藝術視為感情的抒發，重點則是作品中的創意表達。懷茲指出，這兩種定義頂多只是希望大家能從新的角度來看藝術，而藝術教育人士確實也開始思考課程中更多的可能性，從藝術教育的多元化可以看出，分類已經從傳統的概念逐漸轉變成「家族式分類」。

原型類別——傳統理論中，同一類別中各份子具有一些相同的特性，這些特性正是這個類別的定義，因此每一份子的地位都是平等的(Lakoff, P.40)。但是到一九七〇年代初期，羅什(Eleanor Rosch)發現有些類別，例如顏色、鳥和椅子，具有所謂的「原型效應」。如果要一個人把顏色分類，他會把各種藍色歸在一起，各種紅色歸在一起；但是如果要找一個最典型的紅色或藍色，大部分的人也可以馬上指認出來，這些最典型的顏色就像特定的原型，往往具備家族式特色，成為分辨顏色的基準。「原型」的存在代表在某一類別中，有些組成份子比其他份子更具代表性，而在傳統理論中，同一類別的所有份子地位都平等，兩者有著顯著的差異。

「原型」也使我們了解到關於分類的另一個現象，拉可夫1975發現人常會利用修飾語或模糊的語言，來因應傳統分類中的僵硬死板。例如以下這一段話：「在北美溫帶區居民的眼中，知更鳥尤其是鳥中之鳥，因為當地其他鳥類的特色幾乎都可以在知更鳥的身上找到，相對的企鵝和雞就不太可能享有這種地位，嚴格說起來企鵝和雞也是鳥，但是在鳥類當中它們顯然比較不具代表性。」其中的「尤其是」和「嚴格說起來」，都是為了擺脫傳統類別的束縛所用的「閃爍其詞」。

基本類別——羅傑·布朗(Roger Brown)提出的「基本類別」(Brown, 1958; 1965, PP.317)，與羅什的「原型類別」相類似，布朗也發現在類別當中，各組成份子有高低層次之分。例如，小孩子學到「花」這個類別，可能是來自種花、摘花或聞花香這些行為，除了認識「花」這個名字，也知道這是一種生物類別；往後他可能會再學到有各種不同的花，像玫瑰，以及所有的開花植物都屬於植物界，然而最基本的類別仍然是「花」。所謂的「基本

類別」，拉可夫認為大致有以下幾個特色：

- 基本類別通常是從具體行為中建立起來的，例如「花」和聞花的關係。
- 基本類別出現最早，在學到事物名稱的時候就建立了。
- 基本類別的名稱通常最短，或是使用的頻率最高。
- 基本類別通常是「自然」的分類。

稱之為「自然」的類別，是因為基本類別通常建立於實際的行為(Lakoff, 1987, PP. 32-33)。拉可夫指出，藉由不斷的學習，基本類別會漸趨複雜而向上發展出層次較高的「高等類別」，例如植物界就是一種高等類別，包含所有種類的花；當然基本類別也可能向下發展出所謂的「次類別」，例如玫瑰又可分為各種顏色品種。高等類別和次類別，比較不可能從自然行為中建立起來，布朗因此將這種衍生的分類稱為「想像的產物」(Lakoff, 1987, PP.32-33)，衍生的分類使得「花」這個類別更加豐富複雜。整體來說，基本類別和羅什的原型類別作用相同。

一些啓示

心理學、語言學及哲學對「分類」所做的研究，都對傳統的類別概念提出質疑，傳統的類別概念認為我們心中的類別，等於真實世界的類別，這些類別屬於先驗而非後設，是內心固有的觀念，例如康德就是抱持這樣的主張。然而現在的研究都指向類別是由重複的經驗中概化而得的知識架構，主要是感官知覺的經驗，由於這些經驗多半來自抓取、觸覺、視覺等具體動作，所以說這些「類別」是自然形成的，雖然抽象卻不虛無。

另外，拉、強兩人還觀察到「日常生活所用的類別大多是比喻，我們日常所做的推理也包含許多比喻性的演繹，因此日常所用的理性，本質上其實屬於想像」(Lakoff and Johnson, 1980, P. 193)。兩人指出：

比喻是一個重要的工具，幫助我們盡可能理解那些無法完全了解的事物，例如人的情感、美的經驗、道德與宗教。這些事物都要靠想像，但也不是與理性無關，因為用到比喻就需要發揮想像的理性(Lakoff and Johnson, 1980, P. 193)。

拉、強兩人早期(1980)合著的《生命中不可或缺之比喻》一書，提出一個知識理論，說明人會建立基本類別、原型類別，或利用比喻來創造意義，

以突破傳統分類的限制。書中還討論到以心象基模做為一種知識架構，成為認知概念的基礎，而在這樣的認知過程中，要培養分類、推理、命題形式的思維、非命題形式的思維這些能力，都會應用到比喻和敘事，想像因此具有關鍵的作用。

上述各種認知形式都可以運用在各種不同領域當中，只是命題式的推理較常見於哲學、物理和數學，在藝術中則是比喻和想像較為普遍。比喻偶爾也會出現在科學家的語彙，只是較不明顯，以下的例子是將「理論」比喻成「建築物」：

這就是你的**理論基礎**嗎？

量子理論需要更多的證據來**支撐**。

只靠這些假設，你是**建構**不了一個理論的。

我還沒想出我們的理論要採取什麼**形式**。

這裡還有一些事實可以**支持**你的理論。

進化論不會因為這個論點的**強弱**而更**鞏固**或**動搖**。

到目前我們還只有理論的**骨幹**(Johnson, 1987, P.104)。

以上的例子說明了「理論-建築物」是極常用的比喻，許多科學家甚至沒有察覺到自己常常在使用「比喻」！

接下來我以藝術家馬克·夏卡爾(Marc Chagall)為例，討論比喻在藝術中不同的作用。

夏卡爾的時鐘——夏卡爾一九二〇年代的畫作中，時鐘是一再出現的意象，這些時鐘有翅膀而且在飛，現實生活中時鐘當然沒有翅膀，也不可能會飛，那麼夏卡爾為什麼選用這樣的意象？他是在比喻時光「飛」逝，表達他對時間的看法，還是回憶他在俄國度過的年少？有翅膀的鐘也顯示，畫作是夏卡爾的想像世界，自然界的定律不復存在；有些評論家認為這些鐘代表心的跳動、生命的點滴流逝。這些詮釋孰是孰非，我們無從得知。

也因此這類藝術作品具有大衛·柏金斯(David Perkins)所謂「發人深省」的功能，長了翅膀的鐘成為思考詮釋的對象，激發人的認知活動，這是一個「活」的意象。這個例子說明了比喻在科學中出現時較不明顯，但在藝術上卻恰好相反。

皮亞傑發展理論中的認知結構

拉、強兩人的理論奠基於「心象基模」的概念，爲了進一步說明這個概念，我以皮亞傑的基模概念做比較。「基模」出現在認知發展的理論已有一段時間，也是皮亞傑等人研究的重點，他認爲嬰兒一旦辨認出經驗中一定的規律特性，認知的發展就開始了，接著嬰兒會愈來愈依賴過去的經驗、引發這些經驗的動作、產生的結果，據以決定未來的行爲。

皮亞傑認爲認知能力的發展，有賴於「基模」這種認知結構的形成，他以這個概念來說明人對特定的刺激何以會有固定的反應。所謂基模，是心智將感受到的事物經過整理組織而得到的象徵結構，這些抽象結構是從許多不同的經驗中歸納出來的，但是我們內心同時也會記得每個經驗中特定的動作行爲。基模結構愈發展，會愈趨抽象、內化，愈來愈不需要依賴感官知覺。皮亞傑將認知發展分爲幾個階段，每個階段的基模結構都有一些改變，例如在「形式運作」階段，心智能夠將邏輯、科學的命題組織爲象徵結構，以描述、解讀甚至準確預測自然界事物的發展。皮亞傑還主張基模會逐漸演變成邏輯的、科學的和命題式的結構，而他的研究重點就是觀察幼兒從最初的肢體動作（例如抓取東西），一直到發展出抽象的象徵結構（包括語言和數字觀念），詳加記錄這段期間的認知發展。語言和數字本身雖不具意義，但是公認爲真實世界的代表。

皮亞傑並沒有討論到基模是否可能以心象的形式出現，因爲在他眼中知覺並不是一種智力，只是我們藉以了解外在事物所使用的一種工具(Flavell, 1963, PP. 31-33)。

從皮亞傑的觀點來看，認知發展的目的不在於培養清楚的理解力，使人對現實能有更透徹的了解，而在於建立起完整的邏輯結構，幫助我們在處理問題時更能隨機應變。福拉威爾(J.H.Flavell)討論皮亞傑的基模時還提到另一點，認爲這些抽象結構其實就是各種觀念、類別或策略，藉以將一群獨立但類似的動作歸納在一起(1963, PP. 54-55)，值得注意的是嬰兒早期在發展這種能力時，靠的是身體動作來探索外在世界。

拉可夫和強森的基模

雖然拉、強兩人並沒有直接提到皮亞傑，但是他們兩人和皮亞傑有一個差異，他們的哲學和語言學研究是希望從「實體」的觀點，也就是從身體的感官知覺來描述「意義」(Lakoff, 1987, P. 267)，他們相信直接從感官經驗中習

得的基模，是各種認知能力的基礎，包括分類、抽象推理、命題式及非命題式思考、比喻、敘事等能力，人可以透過感官直接了解經驗的內容，不需要心智刻意的運作。強森以「平衡」這個心象基模為例，這個基模可以應用在許多和「平衡」有關的現象，而最初出現「平衡」的觀念，是基於親身的經驗，因為我們處在有重力作用的環境，必須時時刻刻保持平衡。強森寫道：

我們必須了解，平衡是從身體動作中學到的，而不是靠一堆公式規則，最重要的是動手去「做」，例如剛學走路的嬰兒想站卻站不穩，最後跌倒，但多試幾次他一定會站起來，而那一刻對他來說就像發現新大陸——一塊站著才能看到的新大陸(Johnson, 1987, P. 74)。

「平衡」這個心象基模，是在學站學走這些活動中建立起來的，這時候的嬰兒往往還不會講話，不會說「站」、「走」這些字，更不可能說出這些經驗的非命題式特徵。但一旦孩童發展出這種能力，就可能用來描述各種事物，例如健全平衡的人格、平衡的方程式、經濟成長與環保要平衡發展等等。

從「平衡」的例子中，可以看到許多非常抽象的觀念、事件、狀態、機制，都會用具體的事物做比喻，以幫助我們了解抽象的事物，例如心情、主張、道德、數學運算等。這種「心象基模」的延伸投射，我稱之為比喻的創造性功能，這是我們組織經驗、歸納出抽象結構的一大利器(Johnson, 1987, P. 98)。

比喻投射

拉、強兩人進一步指出，較高層次的理性思考可以從「心象基模」延伸出來的「比喻投射」來解釋。這種延伸結構的存在，代表想像力不僅具有認知特質，更可能是認知的基礎，現在我用拉可夫所提出的說法來解釋所謂「比喻」的結構。

拉可夫認為比喻有三個要素，分別是來源區、目標區、來源與目標的關係(1987, P. 276)。要了解「比喻」，必須明白這三個要素彼此的關係。拉、強兩人所舉的例子中，來源區通常深植於感官經驗，拉可夫舉了「往上為加、往下為減」的例子，用這個心象基模所做的比喻有：犯罪率正在向上攀升、

出版品的數目逐年上升、股價又下跌了(Lakoff, 1987, PP. 276-277)。在這些例子中，來源區是「上下」，而目標區是「數量」，上下關係是有效的來源區，因為它符合重力的實際經驗，為什麼向上是增加？因為「倒水到玻璃杯中會看到水位上升，把東西堆成一堆，也是愈堆愈高，如果把東西拿走或把水倒掉，則會看到高度或水位往下降。」因此，透過這種對應關係的投射，上下高低就代表了數量多寡。拉可夫的結論是：

……建立於直接感官經驗的基模，有其基本的邏輯，日常經驗中存在許多「先驗」的結構關聯，促使我們透過「比喻」將這種邏輯映射到抽象區。也就是說，抽象思考是奠基在身體感官的日常運作，使我們能夠從「知覺」去解理「意義」和「理性」。(Lakoff, 1987, P. 278)

比喻能夠將看似毫不相干的事物連結起來，它可以應用在各個領域，當然也包括藝術，透過比喻投射而產生抽象思維。這一點非常重要，說明認知中的抽象思考可以源自身體感官的經驗。拉、強兩人主要的論點，就是源於知覺的心象基模可以達到抽象、知識、邏輯的領域，也就是說，一般所認為的高層次思考，所謂的抽象邏輯思維，最初還是源於心象基模，而心象基模又來自於感官經驗。

強森特別強調心象基模是想像當中的「非命題式結構」，這個概念是受到康德《純粹理性論》的啟發。康德提出的「想像」理論，將想像分為複製、製作、基模功能、創造四類(Kant, 1977, PP. 273-274)。而強森的研究特別重視基模功能的想像，他進一步將心象基模定義為「經驗經過有意義的組織所得到的具體型態」，也就是身體動作和感官知覺的結構。

而這一點正是強森和皮亞傑不同的地方，皮亞傑將行為定義為心智的運作，會影響感官知覺，而且不同於走路等身體動作，他眼中的基模屬於心智層次，所以產生的是命題式結構。相對的，強森所認為的心象基模屬於身體層次，不過他對身心的看法比較形而上，認為身心不可分割。皮亞傑主張「認知」具有固有的抽象結構，比起康德的理論已經活潑多了，但他仍然認為「認知」愈發展，對感官的依賴愈會逐漸減少，雖然他早年專攻生物學，但仍和康德一樣，認為心智的抽象運作受到感官的影響，就算不是全無也相當有限。

相對的，拉、強兩人主張，身體感官的經驗是「認知」和「意義」形成過程中不可或缺的基礎。他們和皮亞傑一樣，不同意康德所說「高層次邏輯結構是先驗的，而且是理性的普遍本質」(Johnson, P. 99)。拉、強認為高層次的認知結構源於具體實在的經驗，並且擴大認知的定義，除了皮亞傑提出的傳統的命題式基模，也包括非命題式的心象基模結構。

康德對「想像」的看法有問題，是因為他把心智分成兩部分，一部份是受自然法則控制的感官部分，包括身體知覺和感情，另一部份則是負責抽象思考的部分。這種將知覺經驗和理解一分為二的觀念，可以回溯至笛卡兒的理性主義，一直到皮亞傑仍然傾向於區分思考與感情。然而康德提出的基模式想像，可能讓兩者再合而為一，強森說：

康德本人大概不可能承認，但他對「想像」的精闢見解，其實與他思想主體中嚴格的二元論自相矛盾，說明從哲學和認識論的角度，身心都是無法分割的，因此也證實「想像」是一種普遍存在的組織活動，使我們能夠進行連貫、完整、有系統的抽象思考。所以我們應該承認，想像絕對是理性中不可或缺的一部份，這裡所謂的理性包括找出事物的關聯、推論與解決問題的能力。當然康德不可能做這樣的結論，否則就等於否定了他自己的身心二元論(Johnson, 1987, P. 168)。

只要不將抽象思考、想像、感官知覺一分為二，康德的難題就解決了，強森說：「何不按照哲學界現代分析學派的結論，將抽象世界和實體世界的鴻溝銜接起來呢？」如果將這兩個世界視為起點和終點，中間是連續的過程，就沒有必要將想像排除在認知之外。康德已經體認到，想像當中有極大部分是共同的意義結構，但就是不願承認「想像」是「認知」的一部份。

「想像」理論的成形

強森認為要清楚了解「意義」、「理性」甚至「理解」和「溝通」，必須先對「想像」有全盤的認識。完備的「想像」理論建立起來之後，可以對概念化、命題內容、言談行為等相關的理論，發揮互補、更新的作用，以最廣義的定義來說，這樣的理論可以完整說明人的經驗與認知兩者之間的結構(1987, P. 171)。強森還提出，這種從認知觀點出發的「想像」理論，應該包含數項特徵，其中三項說明如下：

分類—強森所指的「分類」不同於傳統觀念中的「分類」，這裡的「分類」認為人的確有能力將經驗拆解為各種有意義的「類別」，其中「原型類別」又比其他有條件限制的分類方式受到青睞(P. 171)。

基模—他認為基模必須有一套完備的理論，也就是「可以廣泛套用的知識或事件結構，我們需要探究各種基本基模，了解其形成發展的過程、基模與基模之間複雜的關係，以及基模與命題式結構的關聯。」(P. 171)

敘事結構—若要討論人類如何理解外在環境，「就不能不談到『敘事』，人不僅一出生就面對群體之中各種複雜的『敘事』，同時也是從敘事的角度在體驗、在理解、在安排我們的人生故事。」(P. 171-172)

化為「敘事」的詮釋

強森雖然提到「敘事結構」是完整的「想像」理論中一個重要的環節(1987, PP. 171-172)，但是並沒有深入說明這種能力和「想像」的其他成分（例如比喻）如何互動。不過，「敘事結構」和「比喻結構」確實有其共通之處，例如兩者都源於日常生活中的一些難題或困境，傑若·布朗納(Jerome Bruner)將這些起源稱為「困難」(Bruner, 1996)，例如典型的「敘事」常是這麼開頭的：

「我本來一個人在街上走得好好的，誰知道突然……。」情節慢慢發展，直到出現出人意表的轉折，最後再回到原本的穩定狀態，或是發展出新的穩定狀態(Bruner, 1996, P. 94)。

敘事也都會有一個結尾（某種解決辦法、結果或教訓），敘事中各個情節之間的轉折和關係也會有所交代。

布朗納還認為「敘事」是後天習得的，透過這種思考模式以建構過去、現在和未來的人類情境(Bruner, 1996, P. 100)；「敘事」並不做解釋，而是有助於「理解」，此處所謂理解指的是「用特定的方式將未有定論的命題加以組織，找出其前後連貫的背景和關聯」(P. 90)。「敘事」只是單純告訴聽者一個故事，這一點和「解釋」十分不同，因為敘事所帶來的理解不像「解釋」具有先入為主的立場，例如關於古羅馬衰亡的記述不只一種，各種版本同時並存，但是仍有好壞之分，有的版本「比較正確，不只是以史實為根據，同時前後的背景、關聯比較連貫，措詞也比較客觀中立等等。」(P. 90-91)

布朗納同時也指出「敘事」對教育的啓發，他認為學校教育普遍把「敘事」當成可有可無的裝飾品是一個錯誤，其實「敘事」是人類用來理解事物的工具中最好用的一種。

歌曲、戲劇、小說等各種形式的「敘事」，長久以來在學校的眼中只是裝飾品，是一種休閒娛樂……。但事實上，許多文化的起源和文化中最精粹的信念，往往都保存在故事中；與我們最切身相關的日常生活經驗，也都像是一篇篇的故事，甚至不管在自己或旁人的眼中，人生就是一則長篇故事。「敘事」對文化傳承的重要性，幾乎不亞於對個人生活的重要性……。神話故事和現代小說同樣都有「困難敘事」，這種形式優於推理、邏輯的命題。因此敘事的技巧和理解能力，對於建構個人生活、找到個人在現實中的定位，具有無比的重要性(P. 40)。

想像對藝術教育的重要

大多數人聽到「想像」就聯想到創作、幻想、發明、發現、新奇的事物，幾乎與日常現實完全無關，這種想法是受到十九世紀浪漫主義的影響；但是強森一再強調心象基模、比喻和敘事，乃是認知當中重要的「想像」要素，活躍於人類認知的所有層面，並不只限於藝術。

但他既強調「想像」是高層次認知能力中（包括抽象推理）不可或缺的元素，那麼「想像」對藝術的重要性也就不言而喻了，因為藝術最重視的就是發揮想像、運用比喻所產生的力量與美感。其次，藝術教育應把課程重點放在增進學生對「想像」的體驗、了解和運用，而其中最主要的途徑就是創作活動，但是賞析藝術作品也有助於培養想像力。藝術教育最重要的使命在於開發學生的想像，加強「想像」在個人在建立意義之過程中的作用，以及促進文化的傳播。強調藝術的重要，並不代表一味追求知識的枝微末節，或否定客觀的現實，其實剛好相反，例如要充分運用一個比喻，必須先了解這個比喻所根據的現實或背景，才能將一個意象或表達做最恰當的比喻。

我必須再次強調，藝術課程的首要使命，應該在於培養想像力，藝術作品中不論是視覺的意象或語文的表達，都不只是事實，更富於言外之意、弦外之音。只有在藝術的領域中，「想像」才會得到最充分的重視，成為探討的主題，不像在科學領域中隱而不顯。

了解「想像」是一種創作的工具，主要為詩人或藝術家所用，我認為是

藝術教育中次要的目的，更重要的是帶領學生進入藝術作品中的世界，了解創作者如何發揮想像力創造出那樣的世界並賦予意義。藝術教育若不能體認到藝術作品中的意義其實都寄託在「比喻」上，也就發揮不了多少教育功能了。

對教育的啓示

認知不僅限於以命題形式陳述的意義，同時也包括非命題形式，但是在學校教育中，大部分課程都是一連串零碎片段的事實，彼此毫不相關。這個現象反映出西方哲學中一項長久的傳統，主要是心智二元論的結果，西方哲學主張心智的一部份是真正的認知，主宰推理、抽象概念、邏輯和命題式言談，另一部份則與身體、感官、物質、感情、想像有關，兩者涇渭分明。強森說：

這種二分法最大的影響就是將所有的意義、邏輯、概念、推理歸為心智和理性的層面，知覺、想像、感情則視為身體的層面，結果造成經驗中非命題式的結構和比喻的結構，在「理解」和「推理」中毫無立足之地。

這樣的二分法影響了人的意識結構，如果思考屬於認知的範圍，相對的感情就不屬於認知的範圍；如果認知要運用語言和數學符號以建構理性或抽象的命題，那麼知覺意象既非命題形式，也就不屬於認知的範圍。這樣的二分法，將一半的心智活動歸類為次要的情意領域。

這種觀念同時也影響了學校課程，理科變成「認知」的學科，藝術則淪為「情意」的科目，藝術教育帶給人的感動和樂趣，其裝飾美化的功能，固然深受肯定，卻絕少有人視之為知識、理解的主要來源。教育最終的目的應在運用「想像」，引導學生充分發揮認知的潛力，這項目的應落實在每一個科目，尤其是藝術科。

藝術在教育中的重要性，在於教導學生必要的工具，以建立充實的人生，這些工具或認知策略包括「想像」的基模化功能，以及所衍生的比喻投射。尤其是比喻能夠建立事物的關聯，借助舊有的知識去學習新的知識，表面上毫不相干的事物因而能夠建立共通性。能夠培養這些認知能力的學科，才應該是課程的核心，才能奠定學生理解的基礎。

雖然認知有多種形式（命題式與非命題式），但我認為彼此並不對立，相反的，兩者的起源相同，都是源於身體感官在環境中的經驗，包括文化環境。科學家的直覺和藝術家的靈感之所以變成一種本能，是因為他們的心智不是一分為二，而是物理學家大衛·波姆所謂的「渾然一體」的世界，不再區分身與心、理性與感情、個人與社會。要建立人生的世界，有賴於思想、感情和行動中的諸多體驗，能夠建立這樣的人生，歸根究柢就是「想像」的成就。