ALIGNING ART AND EPISTEMOLOGY: ILLUSTRATIONS TO DISTINGUISH DISCOVERY FROM KNOWLEDGE

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ABSTRACT

This paper explains the use of artwork in an exercise to develop students' understanding of the fundamental ways of knowing. The objective is to move students toward employing methods of genuine discovery. Art history provides the theoretical underpinnings for this view, while epistemology poses the aligning principles. The author uses art from various periods to illustrate the transitions between belief, knowledge, observation, and method. Students learn to distinguish between existing knowledge and the discovery of new knowledge in the process of inquiry. This understanding is valuable in business research where organizational phenomena become increasingly abstract at higher levels of aggregation.

INTRODUCTION

Art is among the earliest forms of human communication predating Sumerian cuneiform text by many millennia. Just as written text serves to communicate thoughts, ideas and feelings, art poses a medium to do the same. Paintings or drawings can convey a reality unique not only to the artist, but characteristic of a time and people. Art historians study the motivation and method of artists in order to describe the reality of a time. The representation of reality through art yields information about peoples' beliefs, knowledge, and methods.

Similarly, written communication presents a range of ideas including fiction, faith, and fact. Although there is a unique reality to any idea once it assumes existence in the mind, Peirce indicates that not all such realities will be accepted by the larger community, so he poses a scheme of knowing in order to differentiate them (Buchler, 1955). Peirce posits that there are four fundamental explanations for knowledge: tenacity, authority, *a priori*, and scientific.

Tenacious explanations suggest that one holds steadfast to a personal truth simply because they already believe it to be true. This approach is motivated by the comfort afforded in such beliefs and is generally opinion or faith-based. Unlike tenacious beliefs, authority disseminates knowledge that emanates from institutions. Although these sources have the advantage of being free from personal bias, the credibility of the authority is not necessarily subjected to question or tests of reason. Next, *a priori* methods yield the benefit of ideas that are agreeable to reason, but carry the detriment of being unconfirmed. Since *a priori* beliefs stem from the logic of the mind, our inability to conduct inquiry into some phenomena makes such cases ideal candidates for *a priori* practices.

In contrast to tenacity, authority, and *a priori* bases for knowledge, the scientific approach offers the use of methods that are not only external to individuals and agreeable to reason, but yield the opportunity for inquiry. Since science mandates methods that must be designed to ensure different individuals can reach the same conclusions, it yields learning that has the potential to be accepted by communities and not just select individuals. Of the four methods, science is the only one that defines a systematic process to learn about the unknown by considering the known.

An implication of Peirce's perspective is that the source of our extant knowledge is either belief or prior knowledge. At this point it is important to differentiate between belief and knowledge. In the former case, individuals adhere to unsubstantiated ideas, while in the latter there exists some form of acceptable confirmation for the views held. This distinction is critical for two reasons. First, it suggests the potential for bias on the part of the unenlightened thinker. Second, it emphasizes evidence as the difference between belief and knowledge. In the pursuit of knowledge, the individual is not asked to discard their beliefs, but to provide evidence for the conclusions they draw so that their beliefs do not bias their conclusions. Science provides the means to remove as much bias as possible from the process by insisting upon the application of existing knowledge in the pursuit of new knowledge.

Since discovery eventually becomes extant knowledge, students can experience confusion regarding what we know and what we will know. This is similar to the confound between belief and knowledge because it can be difficult for a student to discriminate between prior beliefs and what is believed as the result of learning. While our goal is the application of knowledge, sophomore students are apt to stop at a restatement of knowledge instead of applying it to evaluate a case or generate a new idea. The objective of the exercise proposed in this paper is to move students toward employing a more effective, discovery-oriented view.

BACKGROUND AND THEORY

King and Kitchener (1994) suggest that seven stages exist for the development of reflective judgment based upon age, education, and experience. These seven are aggregated into three groups: non-reflective, quasi-reflective, and reflective. In a non-reflective stage, the existence of concrete and absolute knowledge is assumed. Individuals at this stage do not differentiate facts from judgments and do not justify their beliefs because what they believe they believe to be true. Because of this they do not perceive alternatives to their view.

In a quasi-reflective stage, the existence of alternative views and the role of evidence are acknowledged. However, accompanying the recognition of uncertainty at this stage is the perception that beliefs are contextual. The quasi-reflective individual acknowledges different truths as the result of different, though seemingly justified interpretations. Unlike prior stages, at the reflective stage individuals accept knowledge as the result of reasoned inquiry and fitting evidence. Although judgments are still part of the process, the weight goes to the most plausible conclusions based upon effective interpretation, appropriate evidence, and the alignment with similar existing knowledge.

Although the stages of development vary based upon age and education, King and Kitchener (1994) generally conclude that traditional college students between the ages of approximately 18 and 24 develop from a non-reflective stage toward at least a quasi-reflective stage by the time they graduate. The implication of the reflective judgment model for this paper does not depend upon the precise identification of a particular stage of development, but only upon the conclusion that most traditional college students have not attained the highest level of reflective judgment. Other empirical evidence suggests that life experience impacts one's level of reflective judgment (Liberto, Kelly, Sapiro, & Currier, 1990), further implying that students with less life experience would be lower on the reflective development scale.

While in the non-reflective stage, students can learn and subsequently recount their knowledge through assignments like exams, papers, and presentations. Bloom's (1956) taxonomy of educational objectives suggests that these skills demonstrate a learning competence labeled knowledge. In order to extend that competence to the levels of comprehension, application, and analysis, students must understand, interpret, and translate meaning into new contexts. They must also understand causal relationships, solve new problems, and see patterns that allow the identification of system components. Only when students have attained the quasi-reflective stage can they move upward on Bloom's taxonomy because they must be able cope with the ambiguity and uncertainty that accompanies the lack of an absolute correspondence between what they know and what they see.

Ultimately, students will have reached Bloom's levels of synthesis and evaluation when they can make use of prior knowledge in order to develop new knowledge. This is accomplished by integrating ideas, evaluating evidence, and interpreting outcomes to produce plausible conclusions based upon reasoned argument. This level of reflective capacity moves us beyond the acceptance of multiple truths toward one conclusion based upon the most plausible truth.

Since Bloom (1956) indicates that the highest learning levels demonstrate the ability to recognize the role of subjectivity, a link can be forged to Peirce. At one extreme we have Peirce's perspective on tenacious beliefs that yield bias, and at the other the ability to recognize this type of subjectivity per Bloom's evaluation level. Although we cannot hasten students through the cognitive development process, the proposed exercise illustrates the scientific method in a metaphorical way. It is designed to introduce or reintroduce students to the conduct of systematic analyses, so that they can picture both ends of the spectrum. The student learning objective is to be able to discriminate between beliefs, existing knowledge, observed reality, and the discovery of new knowledge through the application of appropriate methods. Although it is ambitious and optimistic, the intended particular outcome is for students to comprehend the source and degree of bias in their thinking.

APPLICATION

The proposed perspective on inquiry is particularly critical in social science because the level of abstraction increases with increasing levels of aggregation. Living systems can be arranged according to the following basic levels of aggregation: cells, organs, organisms, groups, organizations, and societies (Ashmos & Huber, 1987; Miller, 1978; Robbins, 1990). The fields of psychology, social psychology, sociology, and economics generally underpin the study of individuals, groups, organizations, and societies. In business studies these disciplines generally align with the levels of analysis that are covered by organizational behavior, organizational theory, and strategic management. These three have also been conceptualized as natural, rational, and open system views (Scott, 1992).

The implications of increasing levels of abstraction are that phenomena of interest are less and less observable and methods more and more open to interpretation. In the presence of abstraction and the absence of evidence, students are inclined to defer to their current knowledge instead of what they should observe and discover. This exercise is designed to initiate their thinking about the difference between knowing and discovering. The varying perspectives are aligned in Table 1, which portrays the approximate correspondence between the views of Peirce (Buchler, 1955), King and Kitchener (1994), Bloom (1956), and the sources proposed in this paper. The shaded area indicates an incommensurate overlap between Bloom's competence of learning and an individual's predisposed beliefs.

Table 1
Corresponding Sources of Knowing, Reflection, and Learning

Belief	Knowledge	Observation ----------------------------------- Method				
Tenacious	Authority	*a priori* --------------------------- Science				
Non-Reflective -------------------- Quasi-Reflective ------------------------------- Reflective						
	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation

ART HISTORY

The history of art describes a succession of many different art styles. In turn, such transitions afford us a chronological view of changes in the representation of reality between particular times. Among the numerous and varied eras in art history, some of the more distinctive include the Paleolithic, Egyptian, and Renaissance periods. These are deliberately chosen with a particular purpose in mind for this exercise. While the earlier periods yield primitive representations of reality, the latter approach near photographic representations of their subjects.

Paleolithic art. Art historians characterize some primitive art, like cave drawings, as efforts to represent reality based upon the view that people could have power or control over their subjects through the artwork (Gombrich, 1995). Others suggest a magical or religious impetus for the work (Gowing, 1995). In particular, cave drawings show animals in their simplest form depending upon little artistic ability, but still revealing essential characteristics. More than just an observed representation of reality, these early artists were motivated by what they believed to be true about their drawings.

Egyptian art. Egyptian art is characterized by geometric regularity and rules of convention and style dictating that everything be represented in its most characteristic form (Gombrich, 1995). In Egypt, preconceived ideas about the human body were used to represent subjects rather than personal observations of subjects. The Egyptian artists created their work based upon what they knew, as opposed to what they saw.

Renaissance art. The modern masters of the fifteenth and sixteenth centuries reached the peak of perfection in painting representations of their subjects (Gombrich, 1995). Northern Renaissance artists achieved near photographic quality, while the Southern Florentine masters represented nature with scientific accuracy. Eventually the development of photography would replace the function of art as a means to represent reality, but long before that happened Leonardo da Vinci was already making the transition toward discovering another reality that was unattainable even with photography. As we entered the age of reason, da Vinci was not only performing the work of a master artist, but also that of a scientist. His drawings of anatomical forms serve as the final and fitting illustration of art's parallel to epistemology.

ALIGNING ART AND EPISTEMOLOGY

The analogy between art and epistemology is illustrated by examining the reality behind each type of product, whether they are graphic images or the content of written text. Just as knowledge must be acceptable to the community, so, too, must art reflect a common reality. Since art is subject to various interpretations, some deliberate direction must be posited for relating it to Peirce's ways of knowing. Just as knowledge relies upon its source for credibility, art relies upon the artist for its quality. In both cases, the genesis and motivation of the creator can be examined. Since each is attempting to convey a truth about reality, we are compelled to query the genesis of their beliefs and how they intend to arrive at their conclusions. Such inquiry yields the source of the alignment between art and epistemology.

THE EXERCISE

Five pieces of art are chosen for this exercise because they reflect interpretations in ways that align with principles of epistemology. The author uses framed authorized reproductions of original works because they most closely resemble the originals. Although photocopies are possible, copyright normally precludes this approach. Since the authorized reproductions vary the size and shape of the pictures used, they make the experience even more interesting. Pictures of the originals are not included in this paper because of copyright, but Table 2 provides a description of each piece according to the characteristics that are essential to the exercise. Samples of these pictures can be viewed on websites such as Allposters.com and Corbis.com. Over the course of time this author has used a variety of pieces to accomplish the same objective, so other options are possible.

Table 2.
Displayed Art and Its Characteristics

Artwork	Artist	Period	Characteristics
Cave Painting from Lascaux	Unknown	Paleolithic 15,000 to 10,000 b.c.	Simplest representation of cows and horses; minimum essential characteristics to portray the subjects
Egyptian: The Goddess Hathor & Seti	Unknown	3000 b.c. to 500 a.d.	All body parts shown in their most characteristic style; included everything that seemed important; no sense of perspective which would hide body parts; geometric regularity
Renaissance: Arnolfini Wedding	Jan van Eyck	1434	Painstaking, life-like detail to show a near photographic quality in oil paint. A reflection in a small mirror on the wall behind the subjects shows the two subjects from the back; a dog in the foreground has all of its hairs shown in the painting
Mona Lisa	da Vinci	Early 16c.	Famous; realism
Anatomical drawing	da Vinci	Early 16c.	Drawing that shows the muscles of human limbs with skin removed

The artwork is set up in the classroom by leaning the frames against the whiteboard so that notes can be made around the pictures when they are discussed. Students are given a handout on which to take notes. The handout illustrates rectangles that represent the relative size and position and each piece of art. Students are told that the exercise is about the representation of reality. The handout also directs the student to view each picture and asks the student to consider what each picture represents according to the following questions: (a) What are your thoughts upon seeing these pictures? (b) Which are more aesthetically pleasing? (c) In each case, what was the artist doing and why was the subject depicted the way it is? (d) How might these pictures relate to each other? Students are given approximately 10 minutes to observe and reflect upon the questions.

The next step is discussion and interpretations, which can range from a story about the subjects to techniques, ability, motivation, and the meaning behind the pictures. All interpretations are entertained until most possibilities are exhausted. Since the exercise is challenging and interpretations will vary widely, time should be taken to compliment students on their interpretation. Students should not be left discouraged because they failed to produce an explanation to match what they might see as an obscure target. So the next step is to transition to the explanation without suggesting that the student interpretations are completely wrong. This is done by sharing the characteristics of each piece from the view of the art historians. It should be made clear to the students that the interpretations are not coming from the personal opinions of anyone in the room, but from external expert authorities.

Beginning with the cave painting, unless someone approximates the relevant interpretation, students are asked about the motivation behind the drawing. It is unlikely that the drawings existed in order to decorate a cave, so the

question of purpose is pursued here. Further, they are asked about the subject and what it meant to the cave dwellers. It is frequently the case that someone mentions food source, so a follow-on question is to ask why a food source would be portrayed. One answer is an accounting method, but the drawing would have been difficult to change and the light was not good. So another question to pose is what the cave dweller believed about placing the images on the wall. If students do not realize the answers, then the view of the art historians is shared. In this case, they thought that the image would give them some degree of power or control over something very important (Gombrich, 1995).

Next, the view of the cave dweller is challenged by asking the students if they believe that they could have control over things if they are represented in a particular medium. Since the answer is no, it is declared to the students that the cave dwellers were operating from a belief. At this point the word belief is written above the picture on the white board because the genesis of that representation was belief. This characterization might remain unclear until it is placed into context relative to the next picture. The potential ambiguity is shared with the students and they are asked to hold their concerns until the other pictures are discussed.

Now consider the Egyptian painting. An initial question is whether students find the Egyptian painting to be aesthetically pleasing compared to van Eyck or da Vinci's work; and if not, why not? Certainly the Egyptians were advanced enough to do better, so why are things represented in a less than lifelike form and what parts appear less than lifelike? The next question is why the Egyptians depicted their subjects that way. Since this is a very difficult question for most students, the following question is posed: Barring a birth defect or accident, how many limbs does a human being normally have? Because the answer is four, we can accept the fact that the Egyptians accurately portrayed their

human subjects. They thought it unthinkable to represent a figure without showing its parts from the most characteristic view (Gombrich, 1995). A body should have four limbs, so they show all four. The eye is most characteristically known to be almond shaped, as opposed to the triangular shape when viewed from the side, thus they portrayed it accordingly, even on the side of the head. The Egyptians were painting from their knowledge of characteristic forms and the operative word here is knowledge. So the word knowledge is written on the whiteboard above the Egyptian picture.

Once this is done then the cave picture can be revisited in order to contrast belief and knowledge. Here it is important to differentiate between substantiated and unsubstantiated views of the world. We cannot observe a belief that cave dwellers controlled animals by painting them, but we can agree through observation that human beings have the parts represented as characteristic forms in Egyptian drawings.

Next, students are asked what makes the van Eyck painting different from the former two. One can also introduce the painting by discussing the fact that the painter had achieved mastery of his craft. Although arguable, van Eyck is even sometimes credited with inventing oil painting (Gowing, 1995). So the skill of this artist had much to do with the quality of the outcome; however, skill alone does not capture the complete process involved in his method of creation. The following question must be posed: What was he doing during the process of creating this painting? If students cannot answer the question then they can be directed to the adjacent Egyptian painting to contrast knowledge with the potential answer. By this point some students begin to comprehend the issue and pose answers that approximate the idea of observation. The artist did not look at the subjects and then return to his studio to paint from memory. He stayed and observed the subjects while painting them in the classic artist-and-easel form. So, in addition to advanced techniques and ability contributing to mastery, the key difference in this process of creation is observation. In contrast to the cave and Egyptian artists whose sources were belief and knowledge respectively, the genesis of the van Eyck painting was observation, so that is written above the painting.

The Mona Lisa represents the same concept, but is used as a contrast to the anatomical drawing because it is also done by da Vinci. The introductory question here is whether da Vinci was an artist or a scientist? Students generally agree that he was both. The next question concerns the differences in the anatomical drawing and the former pictures. If we refer back to the other paintings and their origin, how does the anatomical drawing contrast? Is it based upon what he *believed* was in the body or what he *knew* was in the body or what he *observed* was in the body? The keen student will suggest that he observed it, so the next question concerns how he observed it.

Some students are aware that da Vinci got into trouble for cutting open bodies, so soon all agree that he opened the body. He had to do more than examine taut skin in order to determine the underlying structure. This is a critical time in the discussion because it is the point at which we must emphasize that method matters. Da Vinci employed a method that allowed him to go beyond a superficial observation and look beneath the surface to discover something new. But it must also be emphasized that the type of method matters. If we are told that we can reach the same conclusion as da Vinci simply by cutting open the leg and we choose to cut it transversely, then a whole different conclusion is reached. A transverse cut might teach us more about blood vessels than muscle structure. We would still learn something, but it is important to emphasize that a particular method serves as the means for replication, so that others can draw the same conclusions. Finally, the word method is placed above da Vinci's anatomical drawing.

In the summary discussion, students are shown the progression from belief to knowledge to observation to method. The point is made that this is analogous to the process of writing a paper. Just as the artist attempts to capture the reality of the world on canvas, so too, the student is attempting to reflect reality when they produce written work. In the educational environment, a student could produce a work based upon their beliefs without ever taking a course, so we emphasize that sharing our beliefs is normally not part of the academic objective.

Next, a student can repeat the knowledge gained from prior or current academic efforts. In that case, knowledge is legitimate since it is derived from course content and text material, but it is only achieving Bloom's lowest level. There is nothing wrong with demonstrating one's attainment of knowledge, but our objectives extend beyond that.

In an effort to move into the areas of comprehension and application, students must link their newfound knowledge to the world around them in contexts outside of the classroom. In order to do this they must observe the world first-hand. If they stop at the observation stage they can still show the ability to comprehend and apply, but the ultimate goal is to have students achieve the competence of analysis and synthesis by applying the scientific method. That achievement will lead them to discovery, as opposed to mere statements of already known facts or simple observations without analysis.

Students are also asked to think metaphorically by considering their written work to be a painting. Then they are advised to avoid creating an Egyptian painting when they write a paper. In contrast, they are encouraged to observe real phenomena and report it with a methodology that is convincing in terms of reason, evidence, interpretation, and plausible conclusions.

A final point is made by asking students if any of this really matters. As a last attempt to convince students that there is a difference between what we might think to be true and an objective reality, students are first shown a painting of horses running that was done in 1820 prior to the ready availability of photography. The pairs of front and rear legs are obviously stretched in opposite directions from each

other, while the necks and heads are shown aligned so that they are almost straight. In general, the horse bodies appear fully extended from front to rear.

Next, the students are shown a photograph of horses running which clearly indicates that the depiction of the horses in the painting is imprecise. We can assume that the artist was doing his or her best to capture reality, but could not do so with the naked eye since the speed of the horses would not allow their observation at a point in time. Only through the method of photography were we able to capture the reality of horses in stride. The photograph of horses running reveals significantly different leg positions with the alignment of the necks and heads to be near perpendicular. Similarly, it is only through the application of the scientific method that we can capture the reality of other phenomena in our world with greater precision.

A SYSTEMATIC VIEW AND APPLICATION

The model in Figure 1 is presented in order to offer students a systematic view of the process.

The figure conveys the relevant components of the scientific or empirical perspective. In particular, the analytical effort involves data collected through the observation of real-word phenomena and the application of existing knowledge. This, in turn, provides a theoretical basis for the point of inquiry regarding unexplained phenomena. Method is portrayed as a mediating variable to indicate that we do not reach conclusions through science without the application of a methodology. Finally, the resulting conclusions must be defensible from Peirce's perspective that they stem from sound reason applied to appropriate evidence resulting in a plausible interpretation that is acceptable to the community and not just a few individuals.

This exercise is done in the context of organization studies and related phenomena. In particular, students are usually assigned the task of accomplishing an organizational analysis. At the individual level of analysis there is much empirical support for human behavior in organizations stemming from the root field of psychology. It is relatively easy to observe an individual and what cannot be observed can be assessed through cognitive measures. Similarly, a group can be subjected to analysis since its meetings and discrete outcomes can be observed. Although group dynamics add a layer of complexity and ambiguity to the effort, the field of social psychology poses a foundation for group study.

Unlike the individual and group levels, an organization cannot be placed in a controlled environment where all of the essential elements of the organization are subject to observation (Morgan, 1997). The student must strive to truly observe organizational phenomena and not fall prey to their predisposed beliefs about organizational life. This view helps students to see the need to observe and use evidence for their assertions about organizational phenomena, such as structure, environment, and strategy.

ART BEYOND REASON

Although the focus of the lesson is on art through the fifteenth century, it is tempting for students to ask about art forms after the Renaissance. In particular, they have expressed interest in impressionist work that does not rely upon the painstaking rendering of details, as well as abstract art and other modern forms. Because the age of reason dawned at the time of da Vinci, one approach to this issue is to consider analogies to the world of writing. Postmodernism seems the most probable answer; however, it need not be limited to that. Since postmodernism suggests a subjective view of the world, it is appropriate to introduce methodologies that are based upon qualitative analysis. While still scientific, these employ a greater degree of interpretation upon the part of the researcher (Lincoln & Guba, 1985).
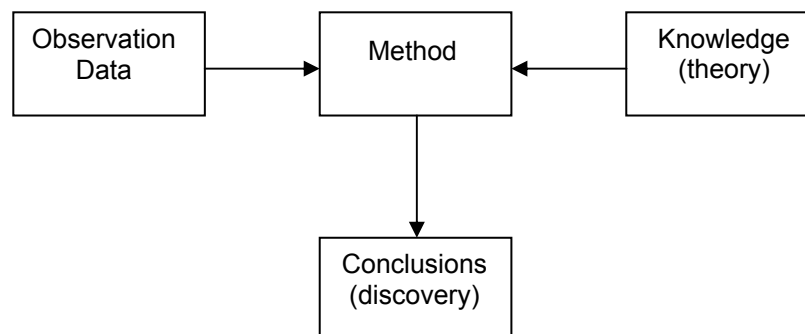
Figure 1. Major components of the scientific method

The qualitative view suggests that we not only need methodology, but we need to know how to look at things. After the discovery of photography, art lost its function as a means to represent reality. This, in turn, contributed to the development of other forms and modern art. Monet, with his use of light created paintings that captured the impression of the moment (Gowing, 1995). The impressionist works are not created with details, but with splotches of paint on canvas. One must view these works from a distance in order to see the artist's intended representation of the image. The impressionist's work is an accurate and precise representation of reality at a particular point in time; that time being when the ambient light is of the desired nature. Monet is said to have painted for only 30 minutes each day at a particular time per painting because the light would remain appropriate only for that length of time (Gombrich, 1995). This suggests that to accurately observe a phenomenon, we must be in the appropriate position at the appropriate time in order to see that reality.

The same method applies to organizations; we need to know where to stand and when (Weick, 2001). The initial objection to the impressionist artists was that their knowledge of what constituted a person was not represented in their work. But it was actually the knowledge of the critics that interfered with what we actually see at a moment in time. For example, Degas was criticized for cutting off bodies at the edge of his paintings, even though that was the observed reality (Gombrich, 1995). We need not work within classical constraints, but must develop clarity and order in the building of new knowledge. Artists have shown us that reality can be represented in different ways and photography is not the sole method of graphic representation.

In the world of written representation, scholars like Gareth Morgan (1997) and Karl Weick (2001) pose provocative means to conceptualize organizations. In each case, the linear rational method is not dismissed as inaccurate, but simply as incomplete. Logical analysis will not capture all organizational phenomena, and an interpretive perspective can uncover missing pieces. In fact, the author credits Gareth Morgan for the ideas that led to the development of this exercise based upon a presentation done by Morgan in 1992. Although this exercise is original, Morgan's use of art in his presentation led this author to think of ways to use art in the classroom.

The idea that modern and abstract art must be interpreted to be understood makes such art analogous to organizations. Some organizational phenomena must be interpreted to be understood. Traditional quantitative approaches will not uncover all of the complexities of human interaction in organizations. A qualitative, yet analytical approach to organizations can yield that kind of interpretation.

The tendency for us is to defer to linear approaches aligns with the status of art in the fifteenth century. Since the dawn of the age of reason we have generally seen quantitative empiricism become the dominant acceptable form of science used to reach conclusions (Gioia & Pitre, 1990). However, modern art could represent the means for us to consider the value of subjective interpretations and the role of the individual in yielding a community supportable belief about the reality around us, but that topic is reserved for a future inquiry.

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